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Massey University

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A 'Pinch' technology analysis of energy integration in the Huntly Power Station

by

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SUMMARY

A technique of energy analysis called pinch technology was applied to the Huntly power station. Its purposes were to investigate the potential for improvement in operating efficiency and the Linnhoff March Limited's 2.5% energy saving claims.

As the plant's power output varies depending on the consumer demand, different data with three different power outputs (i.e. 250 MW, 200 MW and 150 MW) were analysed separately.

This thesis shows that the pinch technology has been successfully applied to the Huntly power station . As the result, several possible areas for efficiency improvement have been indentified. Unfortunately, the savings for the areas of efficiency improvement identified by the technique have proven insufficient justification for the extra complexity in the design.

The overall conclusion is that the plant is already operating at the near optimum levels for the type of equipment used.

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NOMENCLATURE

This section lists the symbols used in the thesis and gives a description of what they represent. Units for each symbol are also shown.

Symbol	Description	Units
A	Heat transfer area	m^2
CP	Heat capacity flowrate	W/°C
CP_C	Cold stream heat capacity flowrate	W/°C
CP_h	Hot stream heat capacity flowrate	W/°C
F	Flowrate	kg/s
H	Flow enthalpy or Heat content	W
δH	Change in flow enthalpy	W
h	enthalpy	J/kg
L	Number of loops in a network	-
N	Number of process streams plus utilities, or process stream branches	-
P	Pressure	Bar
S	Entropy	J/kgK
s	Number of separate components in a network	-
T	Temperature	°C
δT	Temperature difference	°C
δT_{LM}	Log mean temperature difference	°C
δT_{min}	Minimum temperature difference	°C
U	Overall heat transfer coefficient	W/m^2 °C
u	Number of heat exchange units	-
u_{min}	Minimum number of units	-
α	Heat flow across the pinch	W
ø	Heat flow	W

Any extra symbols used will be defined where appropriate.

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SECTION 1

INTRODUCTION

Most processing industries use combinations of heat exchangers for heating and/or cooling process streams. A large amount of the energy used by the processing industries is used just for process heat. In the industrial nations of Western Europe approximately one third of the national energy use is for process heat (Smith, 1981).

The design of most industrial processes is based on a long period of development with many evolutions and improvements leading to a current flowsheet. It is often assumed that these flowsheets are more or less optimal, with no significant "faults" left in them. This is of course not true. An analysis carried out by the New Zealand Dairy Research Institute (NZDRI) showed that theoretical minimum energy consumptions are 25 -30% lower than the actual energy consumption of the most efficient of New Zealand's dairy processing plants (Lovell-Smith and Baldwin,1988). For instance, the average energy use per tonne of casein powder produced in New Zealand is 16.9 GJ/tonne but the optimal energy usage is only 9.9 GJ/tonne.

Recently, Linnhoff March Limited claimed that 2.5% energy saving in Huntly Power Station is possible but unproven. In terms of money this means about NZ$ 80 million of total saving over the station operating life (≈ 30 years).

1.1 PROCESS INTEGRATION

Process integration includes minimising costs, while still producing the product to the correct specification, by obtaining the optimal process design. When designing a process the engineer faces two tasks. First there is the conventional engineering task of designing the individual pieces of equipment. Second there is the task of designing the overall process. This involves decisions of where and how to integrate the various pieces of equipment or whether to integrate at all. Until recently this has been conducted on an ad hoc basis, primarily through the use of engineering experience and perhaps the observation of specific patterns in specific processes.

Pinch Technology, however, allows process integration to be conducted in a scientific and systematic manner. As a result the use of the technology has become quite widespread (B. Linnhoff, 1983, B. Linnhoff & D.R. Vredeveld, 1984 and B. Linnhoff & A.R. Eastwood, 1987).

Over the last six years process integration using Pinch Technology has been proved to provide significant improvements in the design of process plants. It has been demonstrated that the integration results in plants that are cheaper to build and also more economical and easier to operate (B. linnhoff & A.R. Eastwood, 1987).

This shows an optimal process not only results in energy cost savings but capital equipment saving too. This is due

to the fact that most processes are not designed to be as efficient as possible and thus require extra utilities. Linnhoff et al, (1982) and B. Linnhoff & E. Hindmarsh, (1983) stated that about 20%-30% energy savings, coupled with capital savings, can be realized in state-of-the-art flowsheets by improved Heat Exchanger Design. In ICI, the pinch concept was reported to have saved on average of 30% on energy cost, coupled with capital cost savings in new plant designs (B. Linnhoff, 1983 and B. Linnhoff & J.A. Turner, 1981). Payback times in retrofit applications were reported to be typically of the order of 12 months (B. Linnhoff & D.R. Vredeveld, 1984).

1.2 THE OBJECTIVES OF THE PROJECT

The main objective of this project is identify the potential efficiency improvements at Huntly power station using Pinch Technology as one of the major tools. The other objective is to investigate the Linnhoff March Limited's 2.5% energy saving claims.

SECTION 2

LITERATURE REVIEW

Many techniques have been developed for energy integration but essentially all consist of finding a feasible sequence of heat exchangers in which pairs of streams are matched so as to achieve an optimal network.

The heat exchanger network synthesis (HENS) problem was first stated formally by Masso and Rudd (1969). They proposed a systematic method for arriving at the minimum cost heat exchanger network while meeting process specification. They suggested a set of heuristics that could be used to match the streams, so that the network is optimal as judged from an overall cost viewpoint. Difficulty arises from the extremely large number of possible stream combinations. Even for small problems, all possible networks cannot normally be enumerated, due to the inordinate demand for computer memory and execution time. Techniques like branch and bound (Lee et al.,1970) and tree searching (Pho and Lapidus, 1973) have helped to reduce the number of combinatorial possibilities to be enumerated, but the largest problem solved so far in the literature by means of such techniques involved no more than ten streams (Pho and Lapidus,1973). In addition, optimality could not be strictly guaranteed with these techniques, and cyclic network structures (that is, structures in which two streams are

matched against each other more than once) could not be obtained unless the combinatorial problem was allowed to increase in size quite significantly (Rathore and Powers, 1975).

An alternative synthesis method, presented by Ponton and Donaldson (1974), is mainly based on the heuristic of always matching the hot stream of highest supply temperature with the cold stream of the highest target temperature. This method can yield cyclic network structures without additional computational effort, and it has been applied to example design problems of realistic size taken from the previous work of Masso & Rudd (1969), Lee et al. (1970) and Pho & Lapidus (1973).

Unfortunately, the method is somewhat unreliable in the sense that it may produce results which are quite far from optimum so that it tends to generate demand for additional heuristics in unexpected situations. They also showed that for five hot streams and five cold streams that there were $1.6*10^{25}$ possible stream matches. This poses severe computational problems.

Rathore and Powers (1975) pointed out that costs for steam and cooling water will normally be more important than the costs for plant to the extent that several quite dissimilar network topologies will all feature near optimal costs insofar as they feature near maximum energy recovery. Based on this observation, they recommended a procedure to identify the upper bound on energy recovery for a given

problem, and to carry out a tree search in order to rapidly identify some, but not all, networks with maximum or near maximum energy recovery. These networks, they argued, will feature similar and near optimal costs. They can then be compared on grounds of safety, control, starting-up procedures, etc.

There are, however, two basic disadvantages in the approach. Firstly, the computational effort required per final candidate structure identified may not be significantly reduced. Secondly, some suitable candidates might not be found because they narrowly fail to meet design constraints (such as δT_{min}) or the problem specifications (such as a target temperature for a stream).

A realistic synthesis technique should not only be capable of identifying optimal networks for a strictly defined problem but should also allow the user to recognise chances, where they exist, of slightly relaxing problem constraints to gain some advantage.

Nishida et al. (1977) presented an algorithmic evolutionary synthesis method which appears to be suitable for the solution of realistically sized problems. It employs three basic criteria:

(1) maximise energy recovery.
(2) minimise total heat transfer area.
(3) minimise the total cost of the network.

The total heat transfer area is minimised by a minimum area algorithm, while the total cost is minimised using evolutionary rules. Maximum energy recovery is sought by a theorem and corollaries using a heat content diagram adopted from previous work (Nishida et al., 1971). Hohmann(1971) presented a method for synthesis of minimum area networks which also includes a technique for assessing the feasibility of a system of streams assuming a suitable approach temperature and given utility supplies. Hohmann and Lockhart (1976) described developments which are aimed at assessing the feasibility of a network of exchangers by examination of the minimum approach temperature found in the network. Both techniques indirectly provide correct estimates of resource requirements by confirming the feasibility of a network for assumed utility supplies.

Linnhoff and Flower (1978a) developed the temperature interval or TI method. The method allows the users to identify the upper bound on energy recovery for a given heat exchanger network synthesis problem. This method is based on enthalpy balances. It also allows the users to systematically generate a variety of networks which perform at this upper bound. The networks are produced by the TI method with very small computational effort. This has been made possible by interpreting the problem on thermodynamic rather than on combinatorial ground.

However the tendency of the TI method to introduce more units than strictly necessary is a disadvantage. To overcome this Linnhoff and Flower (1978b) developed the evolutionary

development or ED method. The method enables the users to obtain rapid insight into beneficial, or detrimental, effects of potential synthesis steps in the design of heat exchanger networks. Thus, the formulation of strategies aimed at achieving given design goals is greatly helped. This eliminates, by and large, the need to accumulate many different solutions to a given problem before checking whether any display a desired combination of features in aspects such as cost, operability, safety, etc. Instead, the desired features can be methodically introduced in a sequence of evolutionary steps, starting from any feasible structure. Preferably, but not necessarily, the structure from which one starts should exhibit maximum energy recovery. Such structures can always be found by means of the TI method.

Combination of TI and ED methods provides a powerful means to design networks quickly and confidently when thermal integration is somewhat difficult: the TI method will produce the essential matches and the ED method will help to tidy up the remainder of the design to achieve the minimum, or near minimum number of units. However, in cases where thermal integration is easy, or where the remainder of the network is comparatively large, the TI method will leave many options open and pass on rather more possible designs to the ED method than user might wish to handle. Therefore, in order to be able to handle such a case an alternative design method was developed by Linnhoff and Flower (1980).

The method is called TC method (for "thermodynamic-

combinatorial"). It is based on combinatorial principles different from tree searching methods. It uses thermodynamic and topological arguments to reduce the size of the combinatorial problem. This method permits listing of all solutions for a particular problem subject to the following conditions:

(1) the networks use a prescribed degree of energy recovery.
(2) the networks use the minimum number of units.
(3) the networks do not use stream splitting.

An apparent disadvantage of the method is the fact that where solutions of the kind specified above do not exist, the method will yield no answer. This situation would be encountered in problems where full heat recovery is difficult to achieve, i.e., where more than the minimum number of units have to be used and/or streams have to be split for a satisfactory solution.

The main problem in finding a minimum cost network while meeting process specifications was the non-linearity and non-convexity of the cost objective function which is based on the heat exchange surface area.

Hohmann (1971) and Linnhoff and Flower (1978) susgested that the difficulties associated with optimising the nonlinear and nonconvex cost function could be avoided by breaking up the objective function into two specific performance targets:

(1) First determine the minimum utility requirements, that is, maximum energy recovery
(2) then determine the heat exchangers subject to maximum energy recovery.

This led to the definition of the pinch point and to the development of the so-called Pinch Design Method (Linnhoff, 1982 , Linnhoff & Hindmarsh, 1983), and demonstrated that one could predict the minimum utility and minimum heat exchanger unit requirements prior to actually developing the network and then synthesize the network in order to meet these targets. This method is discussed in full detail in the following section.

Cerda et al. (1983) and Cerda and Westerberg (1983) formulated the pinch design problem as a network flow problem and used the transportation model and standard optimisation algorithms to determine the minimum utilities and minimum number of heat exchangers. They developed a linear programing transportation model for the minimum utilities problem and solved it using the northwest algorithm. To determine the minimum number of heat exchangers subject to maximum energy recovery, they developed a mixed linear programing (MILP) approach based on the transportation model and then used several relaxations to reduce it to a transportation problem. This approach requires an initial feasible solution. Cerda et al.(1983) describe a row-column reordering algorithm to determine an initial feasible solution.

In the transportation model, heat flows from the hot streams/utilities that act as sources directly to the cold streams/utilities that act as destinations. Papoulias and Grossman (1983) approached the problem using the transshipment model. In this model, heat flows from the hot streams/utilities to the cold streams/utilities via intermediate nodes or "warehouses". The temperature intervals obtained by applying the rules of Cerda et al. serve as intermediate nodes. Papoulias and Grossman solved the resulting MILP for the minimum units and did not apply the relaxations of Cerda and Westerberg (1983). The minimum utilities transshipment model involves fewer variables than the corresponding transportation problem.

Generally, the transshipment model was used for determination of the minimum utilities and the transportation model was used for determination of the minimum number of units. The disadvantages of both the transshipment and the transportation models are:

(1) they need a feasible starting point.
(2) they cannot handle forbidden and restricted matches.

From all the methods available in dealing with process integration, the pinch design method is chosen for this project. This is because it already has a proven record of industrial application which covers a wide range of industries using both continuous and batch operations. It has been demonstrated that the integration using this method

results in plants, that are cheaper to build and also more economical and easier to operate.

In this project, the pinch method was applied to a thermal power station. The main reason for choosing the station is because so far the method has been mainly applied in Chemical plants. Its application to power stations is not widely recognised yet. The other reason is because Linnhoff March Limited (owned by the founder of Pinch Technology) had claimed that it is possible, but unproven, to reduce the energy use in the thermal power station by 2.5% if the method is applied. In terms of money, this means about NZ$ 80 million of total saving over the station operating life (≈ 30 years).

SECTION 3

PINCH TECHNOLOGY

This chapter provides an introduction to the basic concepts and terminology associated with " Pinch Technology ". It also demonstrates the usefulness of the Pinch method. This is introduced for readers unfamiliar with this area, to provide the necessary background for a general understanding of the main sections of this thesis.

3.1 PINCH TECHNOLOGY TECHNIQUE

Pinch technology is a method of process integration analysis. The analysis consist of four clear cut stages :-

(1) Collect data for temperatures and heat flows within the process.

(2) Calculate the minimum energy targets, giving the energy inherently required to run the plant.

(3) Design heat exchanger networks.

(4) Capital Optimisation.

The first stage needs no further explanation and most of the

data should be present already. Stage two uses a procedure known as Targeting.

3.2 TARGETING

To find the optimal network we must first determine the maximum recoverable heat from the network. Because without knowledge of this amount we will never know when the best network has been obtained.

The temperature-heat content or temperature-enthalpy (T-H) diagram can be used to represent the thermal characteristic of the process stream, as illustrated in Figure 1. Here we are plotting the enthalpy of each stream (W) against temperature (°C). The slopes depend on the value of CP, where :

CP = "heat capacity flowrate" (W/°C)
= mass flow(kg/sec) * specific heat (J/kg°C)

The T-H diagram can be used to represent heat exchange, because of a very useful feature. Namely, since we are only interested in enthalpy **changes** of streams, a given stream can be plotted anywhere on the enthalpy axis. Provided it has the same slope and runs between the same supply and target temperatures, then wherever it is drawn on the H-axis, it represents the same stream.

Figure 2(a) shows two streams plotted on the T-H diagram,

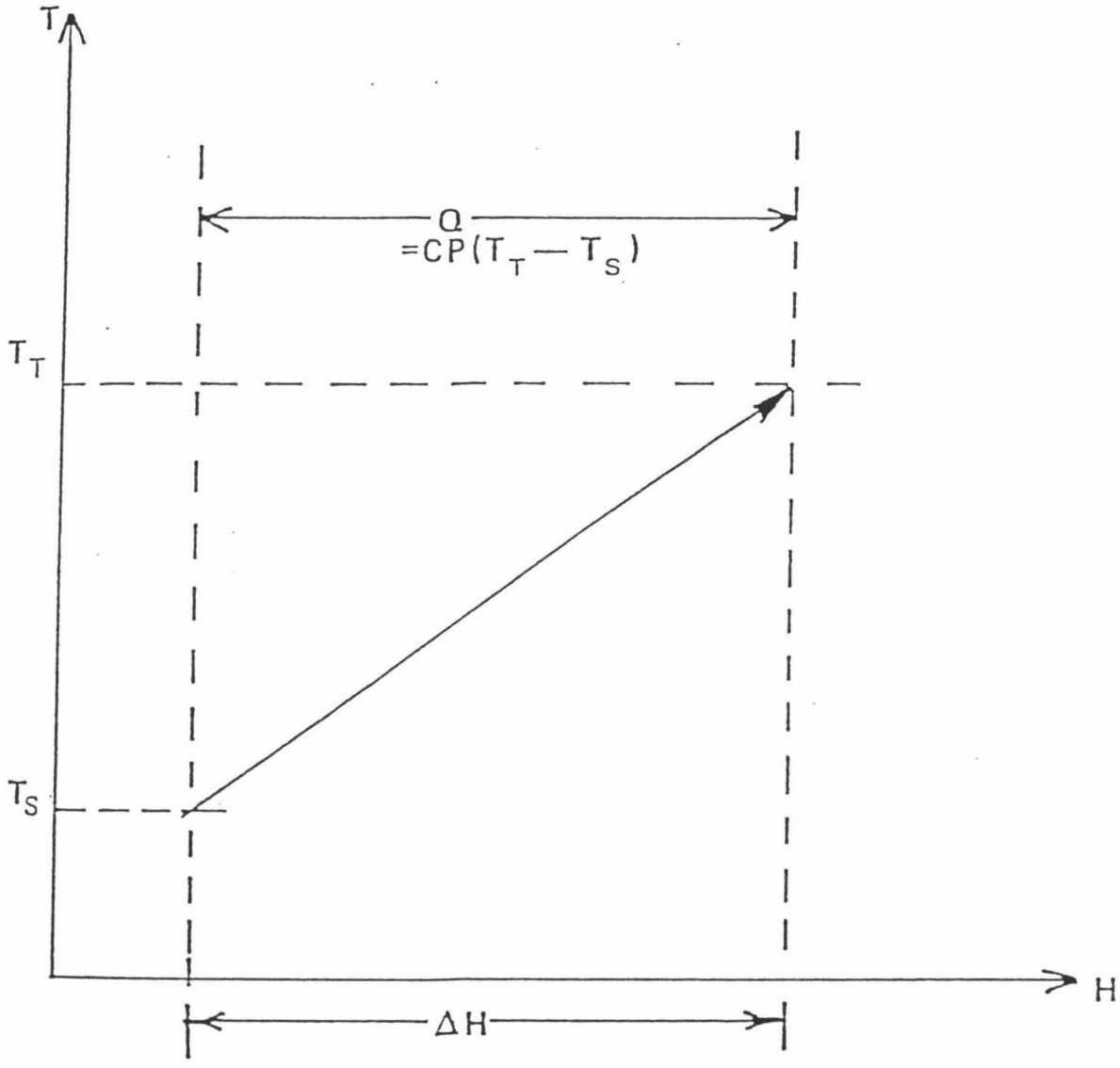


Figure 1 Representation of Process Streams in the T-H Diagram (B. Linnhoff et al, 1982)

one 'hot' (requires cooling) and one 'cold' (requires heating). The hot stream is represented by the line with the arrow head pointing to the left as its enthalpy is negative and vice versa for the cold stream. For feasible heat transfer between two streams the hot stream must have a higher temperature than the cold stream. The case shown in Figures 2(a) & (2(b), is the limiting case because the temperature difference between the hot and cold stream is zero, therefore there is no thermal driving force between the streams at that point.

In fact a positive finite temperature differences must exist between the hot and cold streams if heat transfer is to take place. The Figure 2(c) & (d) show the streams after the cold stream has been shifted to the right on the H-axis relative to the hot stream so that the smallest vertical distance between the streams which is the minimum temperature differences, δT_{min}, is no longer zero, but positive and finite. The effect of this shift is to increase the utility heating and cooling by equal amounts and reduce the load on the exchanger by the same amount. But since:

$$\phi = U.A.\delta T$$

where ϕ = Heat Flow (W)

U = Overall Heat Transfer Coefficient ($W/m^2\,^\circ C$)

A = Heat Transfer Area (m^2)

δT = Temperature Difference ($^\circ C$)

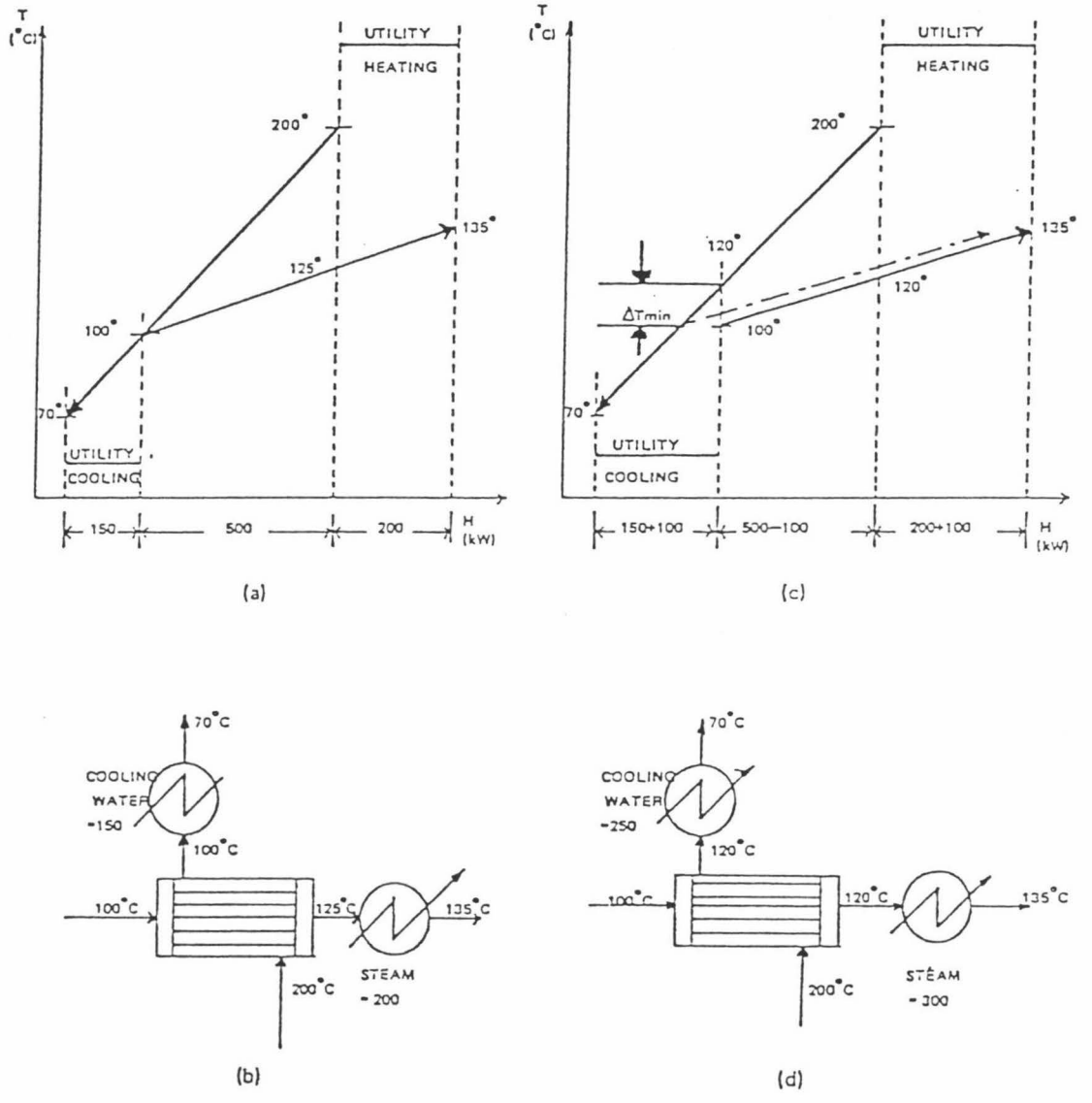


Figure 2 Two Stream Heat Exchange in the T-H Diagram (B. Linnhoff et al, 1982)

It can be shown that as 'δT' is increased 'A 'decreased, if the same heat flow is to be maintained. Therefore a trade off exists between increased external utilities but decreased heat exchanger area.

Normally in real life more than two streams are dealt with , so composite curves are used.

3.2.1 COMPOSITE CURVES

With more than two streams we need a more complex procedure. Starting from the individual streams it is possible to construct one "composite curve" of all hot streams in the process and another of all cold streams, by simple addition of heat contents over the temperature ranges in the problem.

This is illustrated in Figure 3 for a number of hot streams with heat capacities A, B and C being cooled through the temperature levels indicated. The same procedures are followed for the cold streams to produce the cold composite curve.

The result for a set of hot and cold streams is a plot of two composite curves as shown in Figure 4. The overlap between the composite curves represents the maximum amount of heat recovery possible within the process.

The "over-shoot" of the hot composite represents the minimum amount of external cooling required and the "over-shoot" of

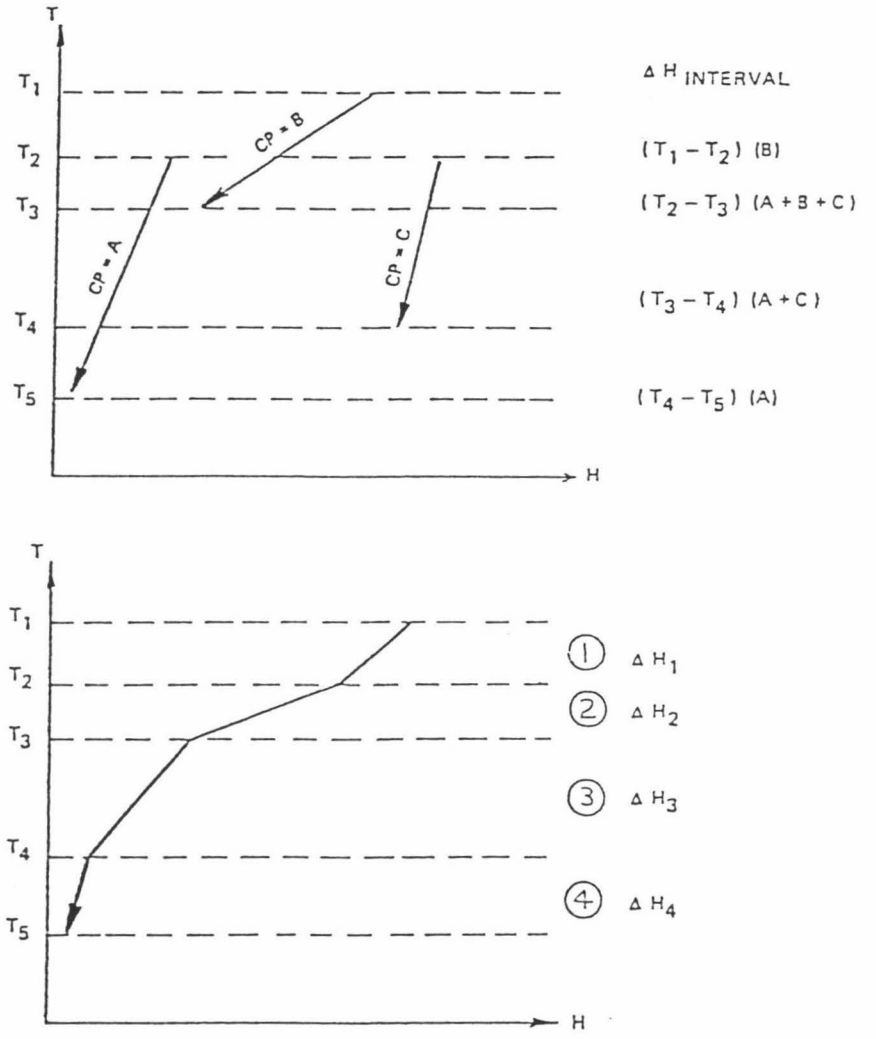


Figure 3 Construction of Composite Curve

(B. Linnhoff et al, 1982)

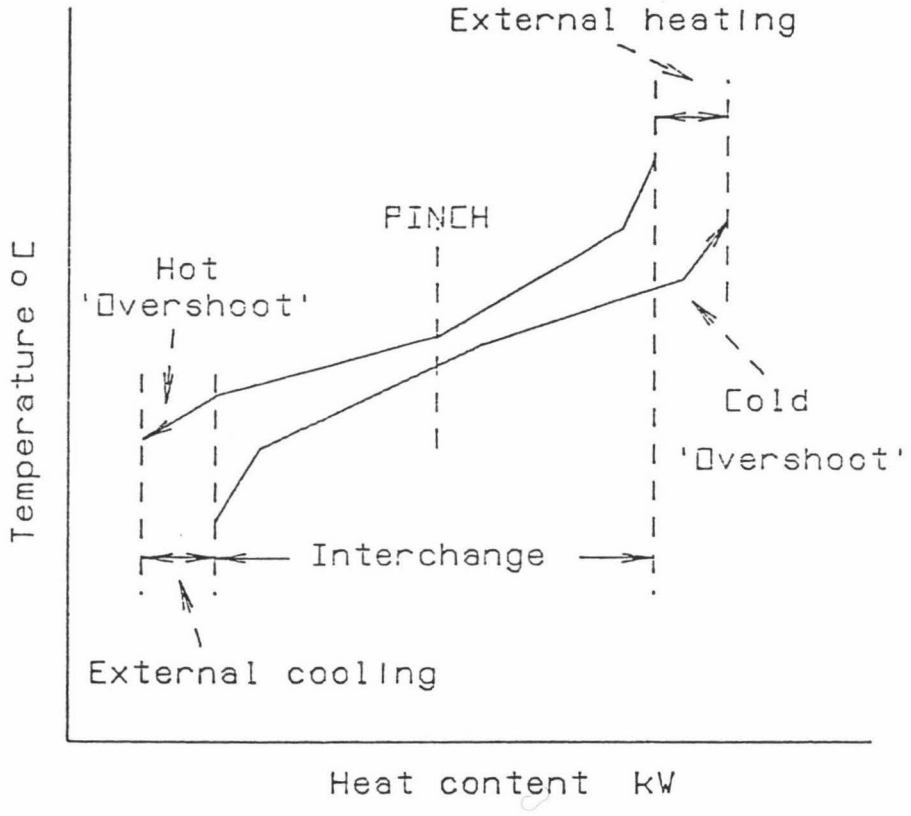


Figure 4 Prediction of Energy Targets Using Composite Curves (B. Linnhoff et al, 1982)

the cold composite represents the minimum amount of external heating. These are called targets. They are set before design and are based on process flow data, not on heat-exchanger information. Because of the "kinked" nature of the curves, they approach most closely at one point. The point at which this closet approach occurs is termed the heat recovery **pinch**.

3.2.2 PROBLEM TABLE METHOD

In principle, the "composite curves" described in the previous sub-section could be used for obtaining the energy target at a given value of δT_{min}. However, it would require a "graph paper and scissors" approach (for sliding the graphs relative to one another) which would be messy and imprecise. An algorithm for setting the targets algebraically has been published by Linnhoff and flower(1978), known as the "Problem Table" method.

The method is broken down into three stages:

(1) Convert the actual stream temperatures to interval temperatures:

for hot streams : $T_{int} = T_{act} - \delta T_{min}/2$
for cold streams : $T_{int} = T_{act} + \delta T_{min}/2$

T_{int} = interval temperature (°C)
T_{act} = actual temperature (°C)

The effect of using interval temperatures rather than actual temperatures is that an allowance has already been made for δT_{min}. δT_{min} is analogous to the temperature difference across the tubes in a shell and tube heat exchanger needed for the thermal driving force. An example problem will now be used to illustrate the Pinch design method. The problem is taken from Linnhoff et al (1982) and the data of the process is shown in Table 1.

The interval temperatures are then ranked and replicate points removed as shown in Table 2. These ranked temperatures set up a series of intervals which will be used later.

(2) A heat balance for those streams which lies within each of the above interval is carried out. The following equation shows how this is done :

For the n^{th} interval : $\delta H_n = (T_n - T_{n+1}) * (\Sigma CP_c - \Sigma CP_h)$

δH_n = net heat requirement of n^{th} interval. (W)
ΣCP_c = sum of heat capacity flowrates of cold streams in n^{th} interval (W/°C)
ΣCP_h = sum of heat capacity flowrates of hot streams in n^{th} interval (W/°C)

The resulting table is shown as the first four columns of Table 3. As can be seen that in each interval there is

Table 1 Example problem stream data

Process stream number and type	Heat capacity flowrate (kW/°C)	Supply temperature (°C)	Target temperature (°C)	Stream heat duty (kW)
(1) cold	2.0	20	135	2.0x(135-20)= 230
(2) hot	3.0	170	60	3.0x(60-170)=-330
(3) cold	4.0	80	140	4.0x(140-80)= 240
(4) hot	1.5	150	30	1.5x(30-150)=-180

δT_{min} = 10 °C

Table 2 Setting up the interval temperature for the example problem

Streams	Actual temperature source (°C)	Actual temperature target (°C)	Interval temperature source (°C)	Interval temperature target (°C)	Ranked order (°C)
(1) cold	20	135	25	140	165
(2) hot	170	60	165	55	145
(3) cold	80	140	85	145	140
(4) hot	150	30	145	25	85
					55
					25

Table 3 Constructing the heat cascade for the example problem

Interval temperature (°C)	δT (°C)	$\Sigma CP_c - \Sigma CP_h$ (MW/°C)	δH (MW)	Heat cascade (MW)	Corrected heat cascade (MW)
165				0.0	20.0
145	20	-3.0	-60.0	60.0	80.0
140	5	-0.5	- 2.5	62.5	82.5
85	55	1.5	82.5	-20.0	0.0
55	30	-2.5	-75.0	55.0	75.0
25	30	0.5	15.0	40.0	60.0

either a residual deficit or surplus of heat, or occasionally neither.

(3) The second law of thermodynamics tells us that heat can only transfer down the temperature gradient. Thus we can, in general, supply the heat deficit of a given temperature interval either directly by hot utility or by "cascading" the heat surplus from a temperature interval higher up the temperature gradient.

This cascading concept has been applied, assuming 0 kW at the highest interval and is shown in the heat cascade column of Table 3. As can be seen there are negative heat flows, this is clearly not thermodymically feasible.

In order to ensure a feasible heat cascade we must increase all heat flows by the magnitude of the largest negative value. This has been done and is shown in the final column of Table 3.

The two values, one at the top (60 kW) and one at the bottom (20 kW) of column six of Table 3 represent respectively the minimum external hot and cold utilities. A zero heat flow in an interval represents the position of the pinch. This is at the 85 °C interval boundary temperature (i.e hot streams at 90 °C and cold at 80 °C). These values are exactly the same as the values obtained if the "graph paper and scissors" approach had been used (see Figure 5).

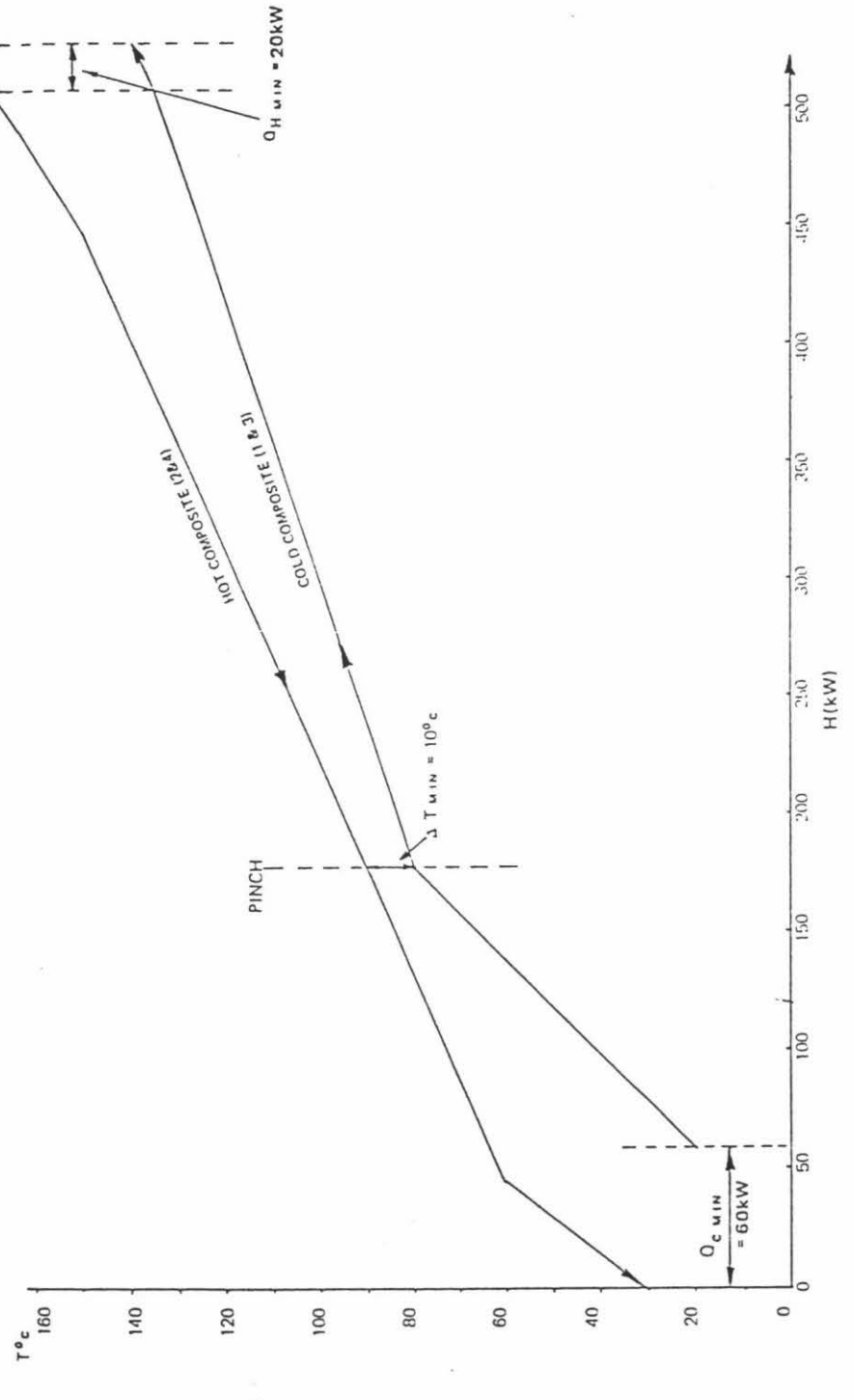


Figure 5 Example Problem Composite Curves
(B. Linnhoff et al, 1982)

3.2.3 THE GRAND COMPOSITE CURVE

The composite curves show us the scope for energy recovery and the hot and cold utility targets. Generally, a number of different utilities at different temperature levels and of different cost are available to the designer. Another pinch technology tool, the grand composite curve (GCC), helps the designer select the best individual utility or utility mix.

The GCC is a graphical representation of the heat cascade. It is produced for our example by plotting the net heat flow at each of the adjusted temperature interval boundaries in Table 3. The resulting GCC is given in Figure 6.

3.3 DESIGN

3.3.1 THE SIGNIFICANCE OF THE PINCH

In Figure 7(a) the system is shown separated at the pinch. In the section above the pinch, the composite hot streams gives all their heat to the composite cold streams with only residual heating required. The system is therefore a heat sink. Heat goes in from hot utility, but no heat goes out. Conversely, below the pinch the system is a heat source. Heat goes out to cold utility but no heat goes in.

However, Figure 7(b) shows the case where the minimum utility targets are not met. External heating is in excess

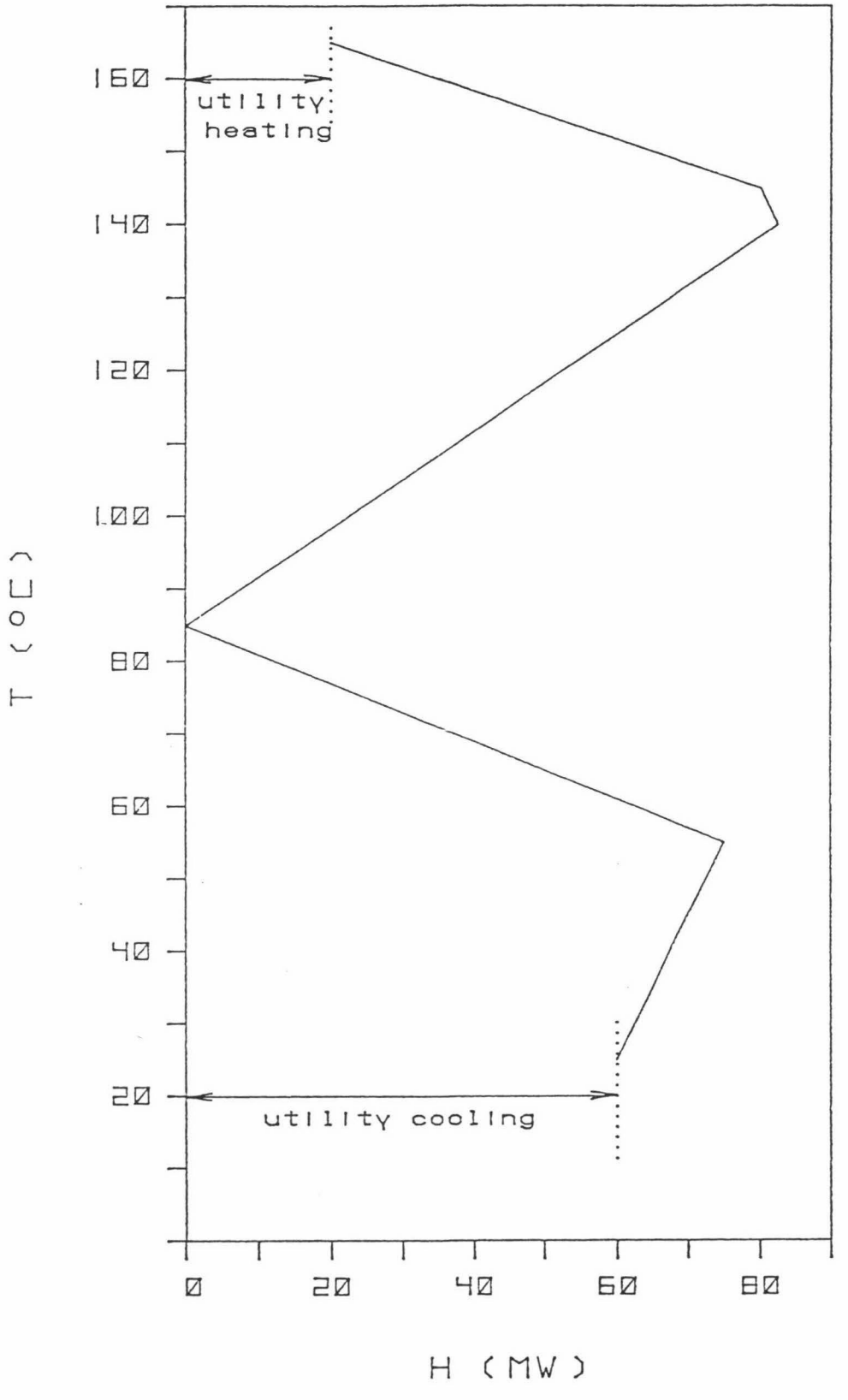


Figure 6 Example Problem Grand Composite Curves

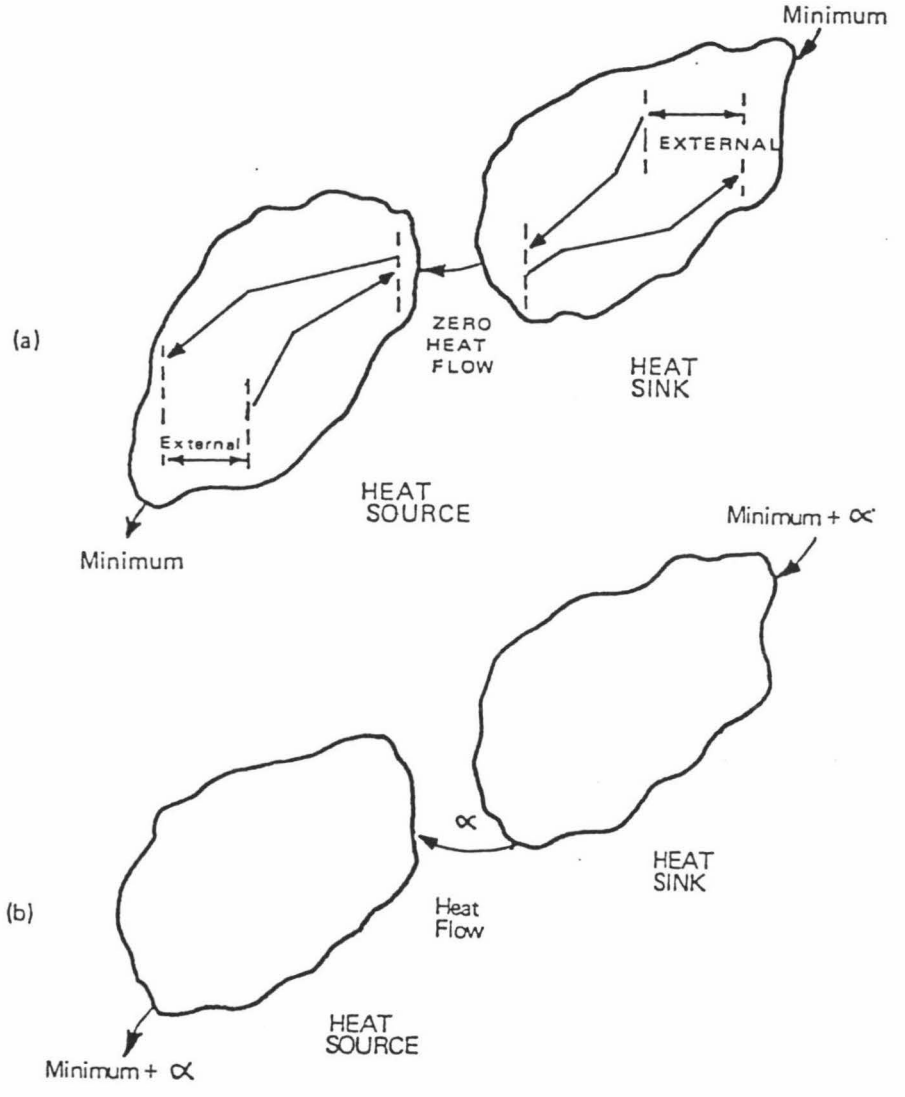


Figure 7 The Source/Sink Characteristic of Process Heat Exchange Systems (B. Linnhoff et al, 1982)

(by α) of the minimum possible. By heat balance around the heat source and the heat sink, there must be a heat flow 'α' across the pinch and an excess external cooling requirement 'α'. So for the designer wishing to produce a minimum utility design, the rules are:

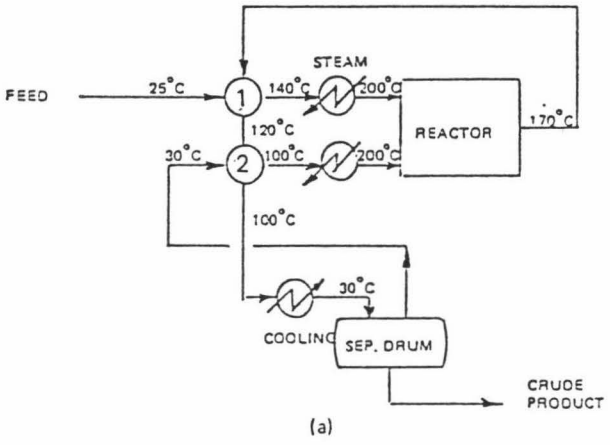
(1) Do not transfer heat across the pinch.
(2) Do not use external cold utilities above the pinch.
(3) Do not use external hot utilities below the pinch.

3.3.2 GRID REPRESENTATION

The heat exchanger from the flowsheet in Figure 8(a) can be represented in the "grid" form introduced by Linnhoff and Flower (1978); see Figure 8(b). The advantage of this representation is that the heat exchange matches 1 and 2 (each represented by two circles joined by a vertical line in the grid) can be placed in either order without redrawing the stream system. Also, the grid represents the countercurrent nature of the heat exchange, making it easier to check exchanger temperature feasibility. Finally, the pinch is easily represented in the grid (as will shown in the next sub-section), whereas it cannot be represented on the flowsheet.

3.3.3 DESIGNING ABOVE THE PINCH

Above the pinch , if best performance is to be obtained, no



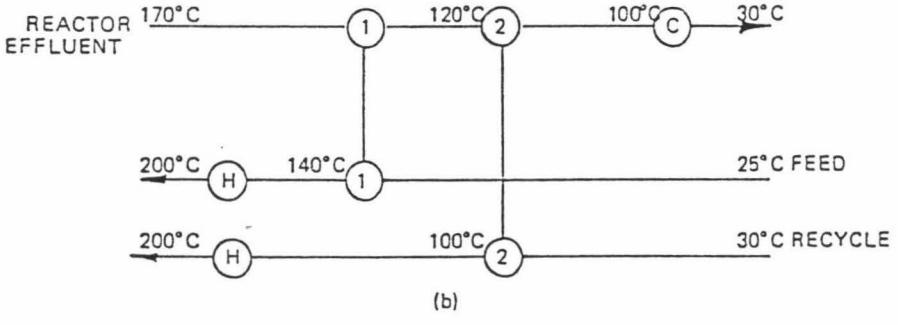


Figure 8 Heat Exchange Network Representation

(B. Linnhoff et al, 1982)

utility cooling should be used. This means all hot streams must be brought to pinch temperature by interchange against cold streams only. Therefore the design must be started at the pinch and worked away from it. It is started at the pinch as this is the most constrained point in the process. The temperature difference between the composite curves should increase away from the pinch.

The grid structure for the problem stream data in Table 1 is shown in Figure 9, with the pinch represented as a vertical dotted line .

For pinch matches immediately adjacent and above the pinch, the number of hot streams (N_h) and the specific heat of the hot stream (Cp_h) must be less than or equal to the number of the cold streams (N_c) and the specific heat of the cold stream (CP_c) respectively. If CP_h is greater than CP_c the composite curves will slope together resulting in a temperature difference of less than δTmin. This is graphically illustrated in Figure 10.

Therefore if there are more hot streams than cold streams then the cold stream must be split. If the specific heats of the hot streams are greater than the specific heats of cold streams for all matches at the pinch, either hot or cold streams must split so that the specific heat rules can be obeyed. Step by step procedures for finding stream splits are given for above and below the pinch in Figure 11(a) and (b) respectively. The method is discussed in more detail in section 2.2.6.2 of the Users Guide on Process Integration

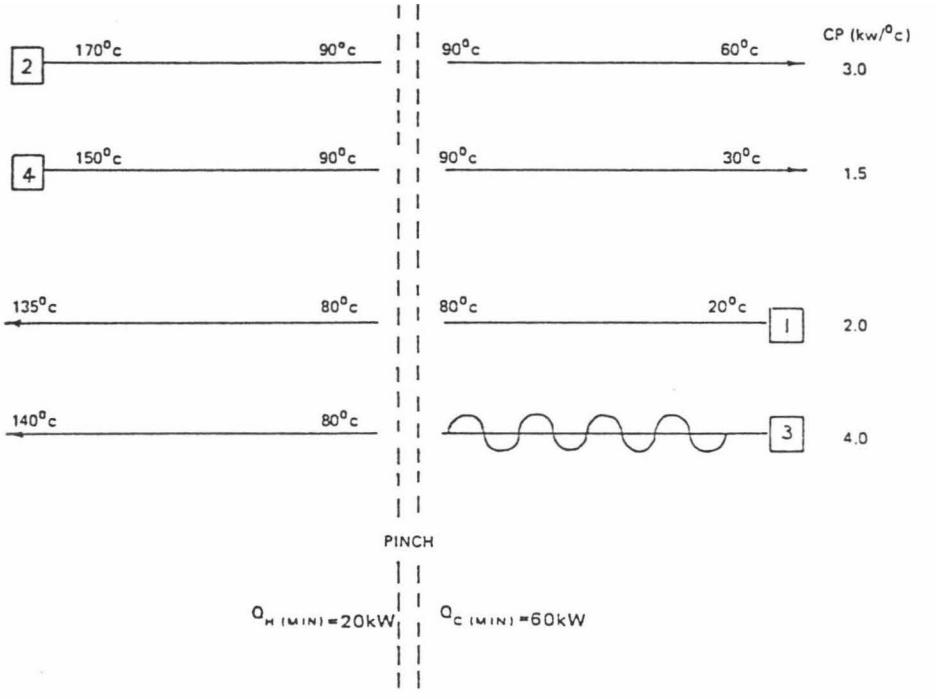


Figure 9 Grid Representation of Example Problem
(B. Linnhoff et al, 1982)

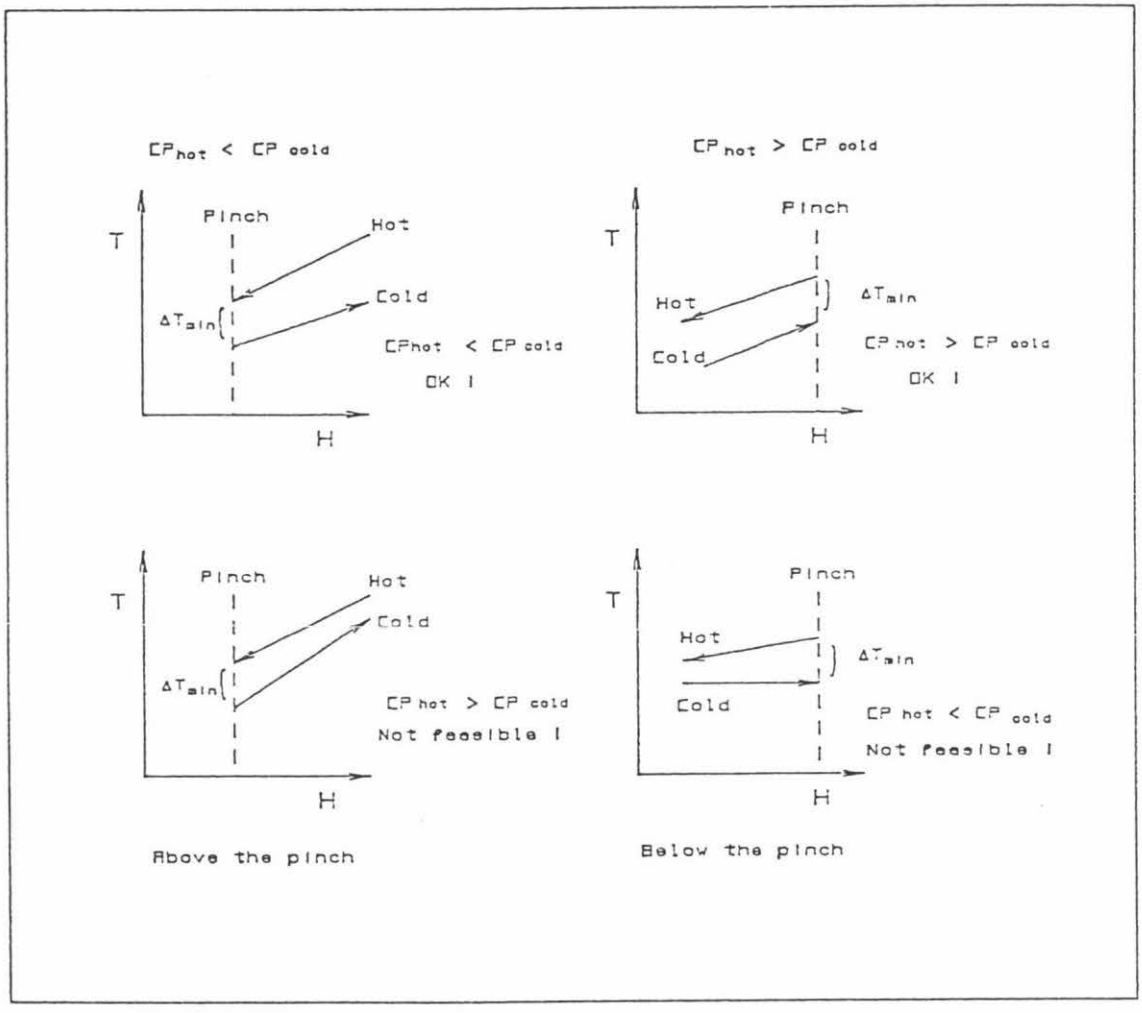


Figure 10 Effect of Specific Heats on Pinch Matching

(G. Smith & A. Patel, 1987)

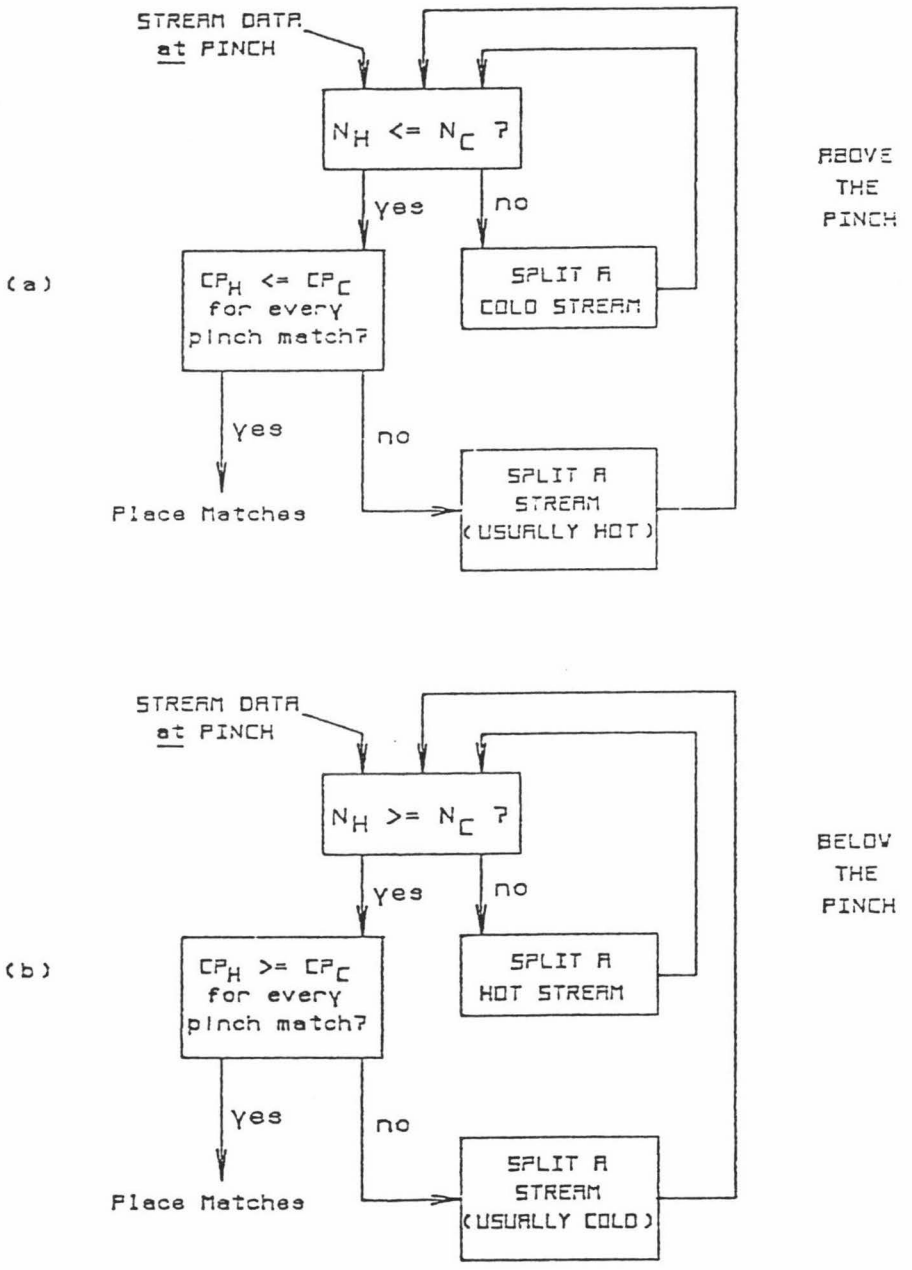


Figure 11 Stream Split Procedure

(B. Linnhoff et al, 1982)

for the Efficient Use of Energy (1982) by Linnhoff et al.

When matching streams the rule that is used is to try to maximise the heat exchange on each match to the limit of either the hot or cold stream. This will eliminate, or "tick off", that stream from the analysis.

Initially, in the example, matching may only take place between streams 2 and 3, and streams 4 and 1. Firstly consider the match between streams 2 and 3. Stream 2 above the pinch requires 240 kW ((170-90)*3 = 240) of cooling and stream 3 above the pinch requires 240 kW ((140-80)*4 = 240) of heating, co-incidentally the 2/3 match is capable of satisfying both streams, which means that both stream 2 and 3 can now be ticked off. Now consider the match between streams 4 and 1. A heat load of 90kW will eliminate stream 4, the removal of 90 kW from stream 1 will result in cold stream upstream temperature of 125 °C (80 + 90/2 = 125 °C). Since both hot streams have now been completely exhausted by these two design steps, stream 1 must heated from 125 °C to its target temperature of 135 °C by 20 kW ((135-125)*2 = 20) of external hot utility, as predicted by the Problem Table analysis. The grid representation of the completed design above the pinch is shown in Figure 12.

3.3.4 DESIGNING BELOW THE PINCH

The design steps for matching below the pinch follow the same method, only that the design criteria mirror those used

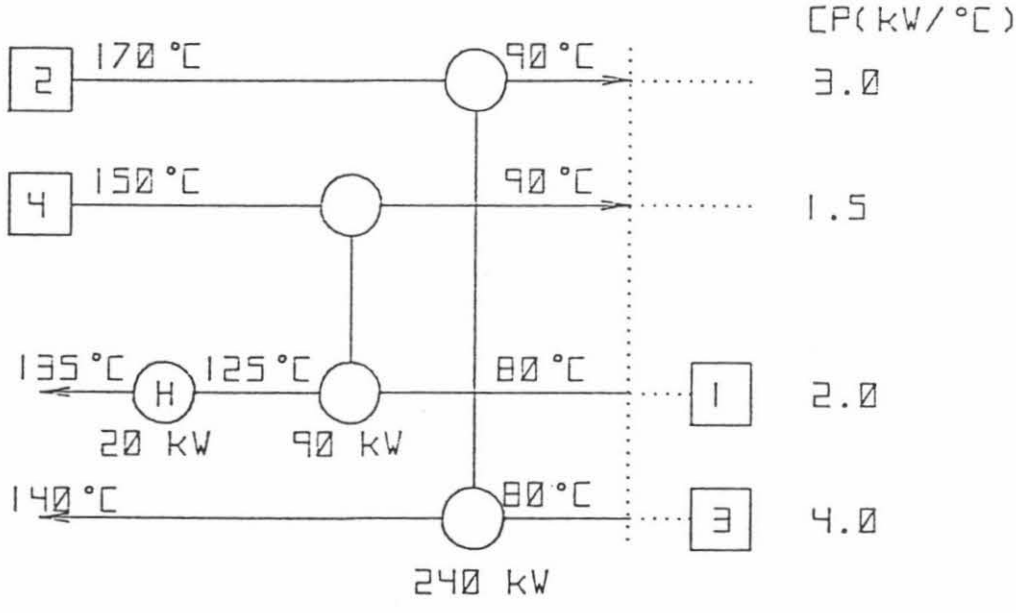


Figure 12 Example Problem Hot End Design

(B. Linnhoff et al, 1982)

above the pinch. It is now required to bring the cold streams to the pinch temperature by interchange with the hot streams, since no external heating utility can be used below the pinch. Again the design is started at the pinch and worked away from it.

Again the first step is examination of the number of hot and cold streams and the specific of the streams. Below the pinch the number of hot streams must be greater or equal to the number of cold stream. And also for the match to be feasible the specific heat of the hot stream should be greater or equal to the specific heat of cold stream, otherwise δT_{min} will be violated. In this example, only one cold stream exists below the pinch which must be matched against one of the two available hot streams. The match between streams 1 and 2 is feasible, as shown in Figure 13(a) because the CP of the hot stream is greater than that of the cold. The other possible match (stream 1 and 4) is not posible because CP_h is smaller than CP_C.

Maximising the load on this match satisfied stream 2, the load being 90 kW ((90-60)*3 = 90 kW). The heating required by stream 1 is 120 kW ((80-20)*2 = 120 kW) and therefore 30 kW of residual heating, to take stream 1 from its supply temperature of 20 °C to 35 °C, is required. Again this comes from interchange with a hot stream, the only one now available being stream 4. Although the CP inequality does not hold for this match, the match is feasible because **it is away from the pinch**. That is to say, it is not a match that has to bring the cold stream up to pinch temperature. So, as

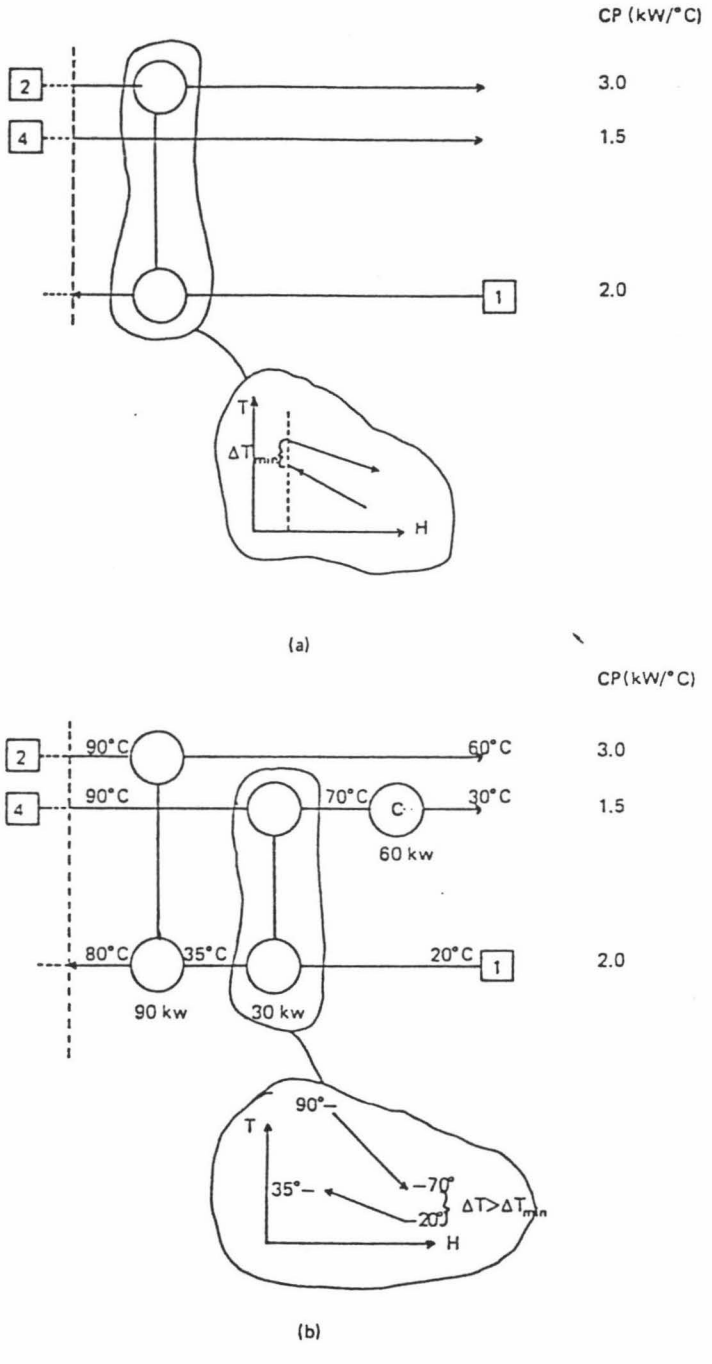


Figure 13 Example Problem Cold End Design

(B. Linnhoff et al, 1982)

shown in inset in Figure 13(b), the match does not become infeasible. Putting a load of 30 kW on this match leaves residual cooling of 60kW (((90-30)*1.5)-30 = 60 kW) on stream 4 which must be taken up by cold utility. Again, this is as predicted by the Problem Table analysis.

3.3.5 OVERALL NETWORK DESIGN

The overall network can be produced by joining together the two separate areas, above and below the pinch. This is shown in Figure 14. There has been no external heating below the pinch, no external cooling above the pinch and no heat transfer across the pinch, so this is an optimal network.

There is usually no unique solution for a problem as the target usually can be met with a different network. Choosing which network to use involves decisions regarding such things as practicality, costs and heat exchange area, overall heat transfer coefficient, type of heat exchanger and the size.

3.4 TRADING OFF ENERGY AGAINST CAPITAL

The optimal network shown in the previous figure has been found using a set δT_{min} with no consideration for capital expenditure. In general there is a trade-off between reducing the overall energy usage, represented by decreasing δT_{min}, and increasing capital cost.

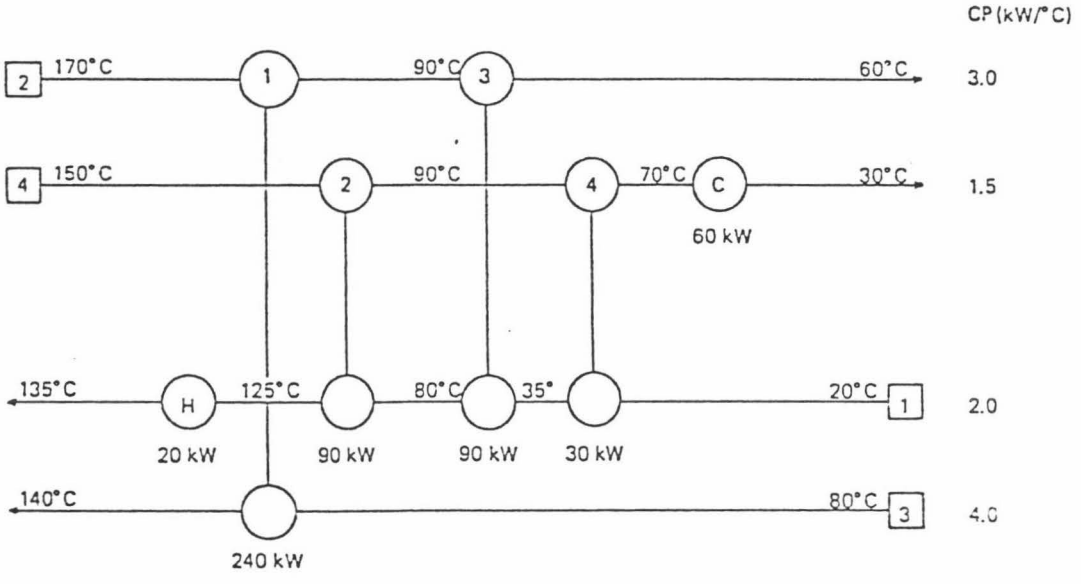


Figure 14 Example Problem Completed Design

(B. Linnhoff et al, 1982)

Techniques do exist to generate a capital cost target as well as an energy usage target. These techniques can be used to define an appropriate δT_{min} to satisfy these targets. The composite curves can be used to evaluate the overall trade-off between energy and capital costs. If δT_{min} is increased the external utilities increase but the capital costs are likely to decrease as shown in Figure 15.

The capital cost of a heat recovery network depends mainly on two factors:

(1) The number of separate heat exchanger units.
(2) The total heat exchanger area required.

Using the algorithms described in the next two sub-sections the trade-off between capital cost and energy recovery can be evaluated explicitly. For various values of δT_{min} (obtained by shifting composite curves horizontally) the energy target and associated overall heat exchanger area required can be calculated. The larger the δT_{min}, the larger the energy targets will be and the lower the overall heat exchanger area. The minimum number of heat exchanger units can be predicted at this δT_{min}. All of this information is combined and used to predict the overall cost for each δT_{min}, before the actual design is done. The lowest overall cost can then be identified as shown in Figure 15. This can then be used as an optimised starting point for design as both the capital cost and the energy targets have been established.

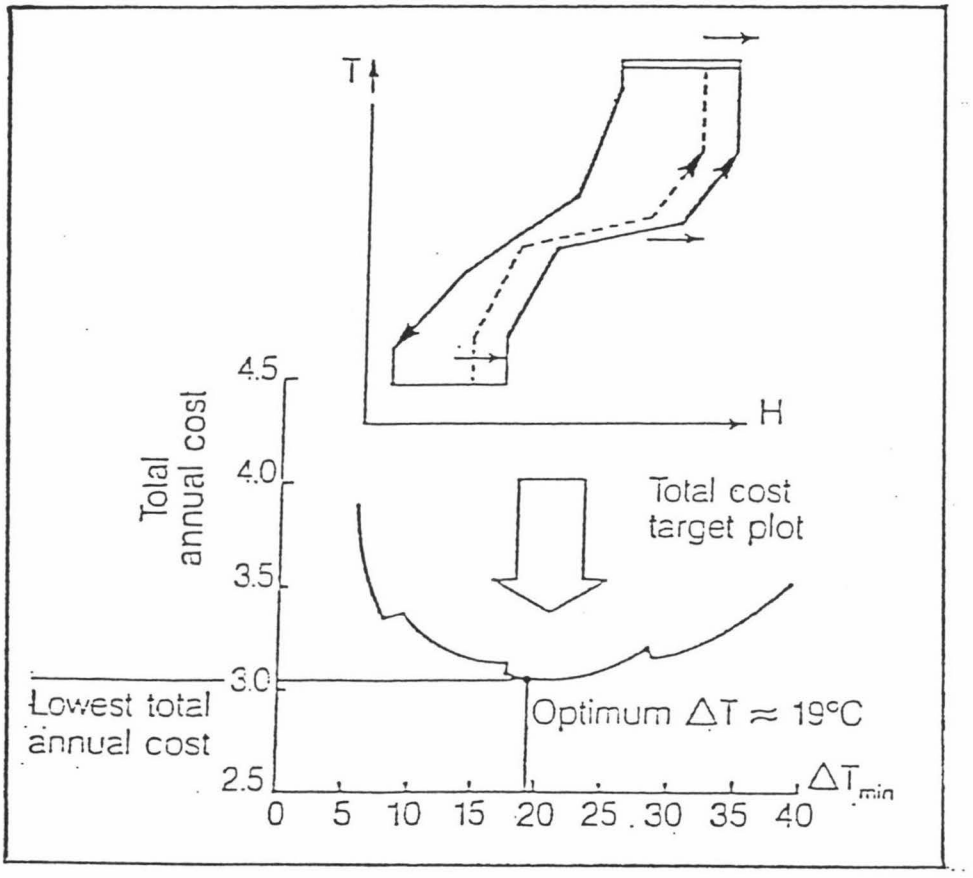


Figure 15 Evaluating the Optimum Trade-off Between Capital Cost and Energy Recovery Ahead of Design (B. Linnhoff & G. Polley, 1988)

3.4.1 MINIMUM NUMBER OF UNITS

The minimum number of units depends fundamentally on the number of streams involved and on the pinch location. It can be calculated, prior to design, from equations based on Euler's theorem known as Euler's General Network Theorem. This theorem, "translated" into the terminology of heat exchanger networks, states that:

$$u = N + L - s$$

where u = number of units (including heaters and coolers)
N = number of streams (including utilities)
L = number of loops
s = number of separate components.

Normally we want to avoid extra units, and so design for L = 0. Also, unless we are lucky, there will be no subset equality in the data set and hence s = 1. This than leads to the targeting equation

$$u_{min} = N - 1$$

where u_{min} = minimum number of units (including heaters and coolers).

Linnhoff et al. (1982) describe this theorem in more detail.

3.4.2 MINIMUM OVERALL HEAT-EXCHANGE AREA

Figure 16 shows that if the process streams in a network exchange heat are arranged in such away that stream matches are "vertical" between the composite curves, then the overall heat transfer area is minimised. This arrangement is equivalent to pure countercurrent flow in a single heat exchanger.

Any match away from the vertical (e.g.,to the left in Figure 17) will gain the local advantage of a larger δT. However, it will later require a match in the opposite direction (with a smaller δT). The net effect of such "criss-crossing" is an increase in the area requirement.

For a system in which heat-transfer coefficients are uniform, the assumption of vertical stream matching leads rigorous minimum area. For nonuniform heat-transfer coefficients, the vertical model is a simplification. However, a useful numerical approximation that applies to this situation has been developed (B. Linnhoff & T.N. Tjoe, 1986):

$$A_{target} = \sum_{i}^{interval} \frac{1}{\delta T_{LMi}} \left[\sum_{j}^{streams} \left(\frac{q_j}{h_j} \right) \right]_i$$

Where, in interval i, there are j streams (hot and cold)

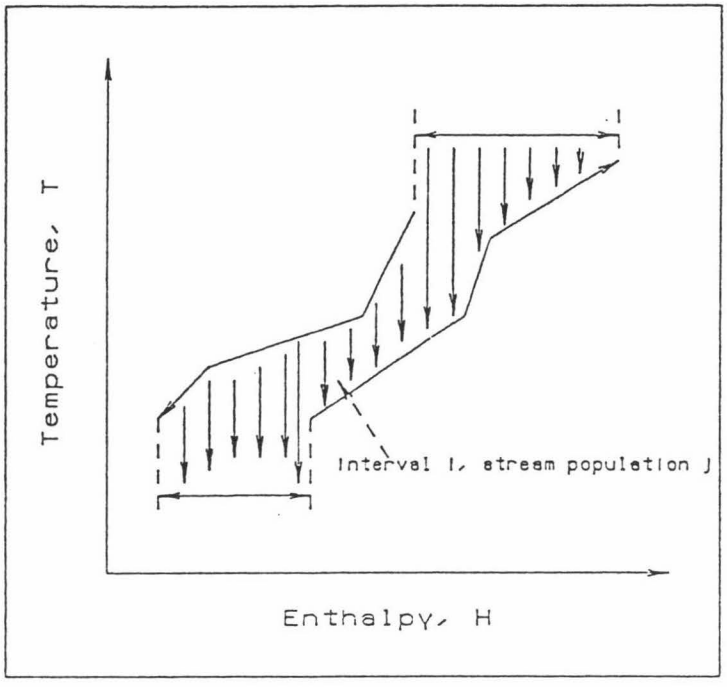


Figure 16 Vertical Matchups Between the Composite Curves Require the Least Heat Exchange Area (B. Linnhoff & T.N. Tjoe, 1986)

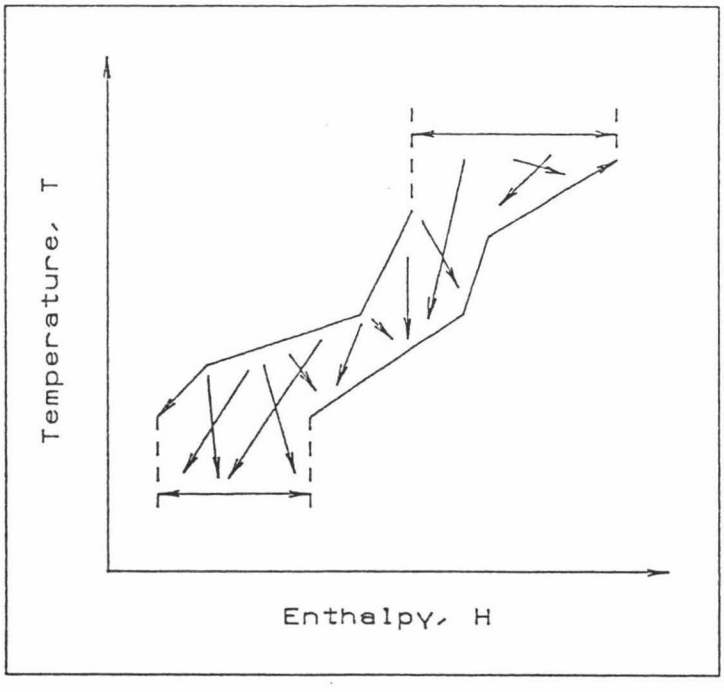


Figure 17 Criss-crossing Matchups Between the Composite Curves Increase the area Needed (B. Linnhoff & T.N. Tjoe, 1986)

with their individual heat loads, q_j, and their respective stream "film and fouling: coefficient, h_j, as shown in Figure 16. δT_{LMi} is the log mean temperature difference in interval i.

This equation provides a useful estimate of minimum overall heat-exchange area. It is usually accurate to within 10%.

To summarise this chapter and give the reader the overall view of the technique; the concepts and procedures described in this chapter are now pulled together into an overall design strategy. This strategy is shown in outline form in Figure 18.

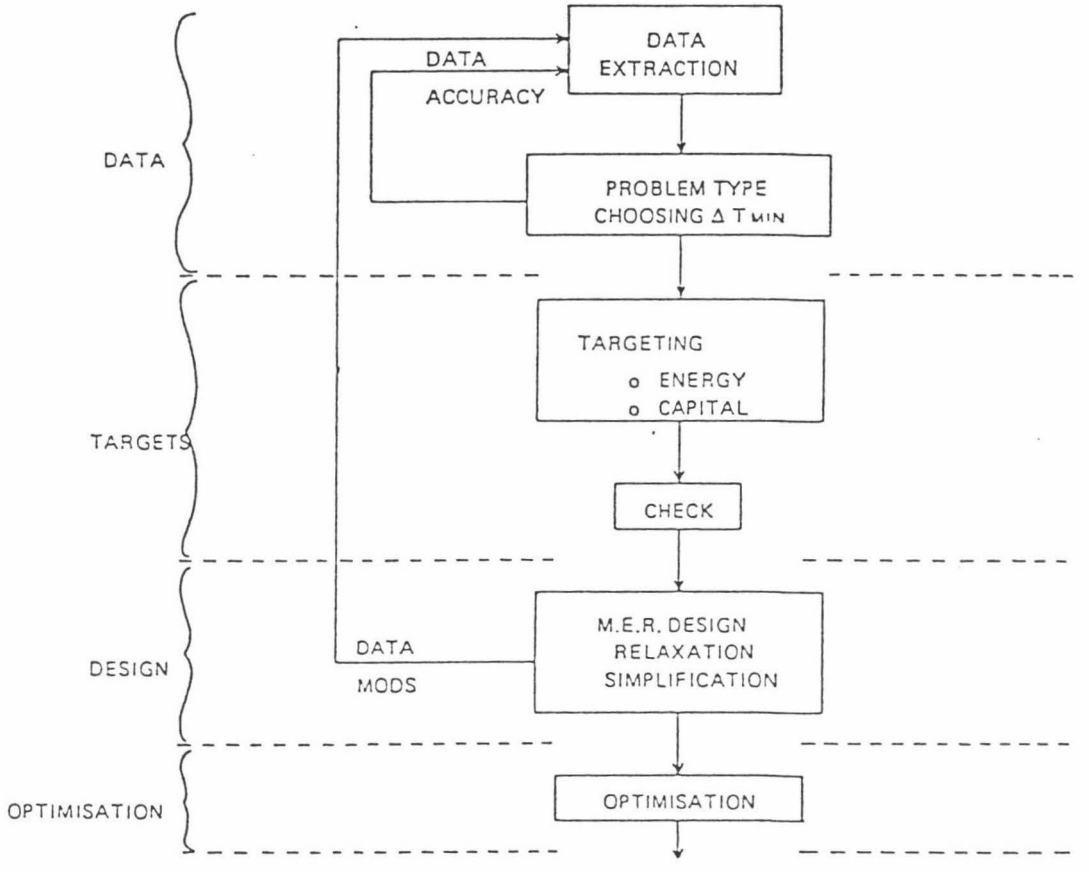


Figure 18 Overall Design Procedure

(B. Linnhoff et al, 1982)

SECTION 4

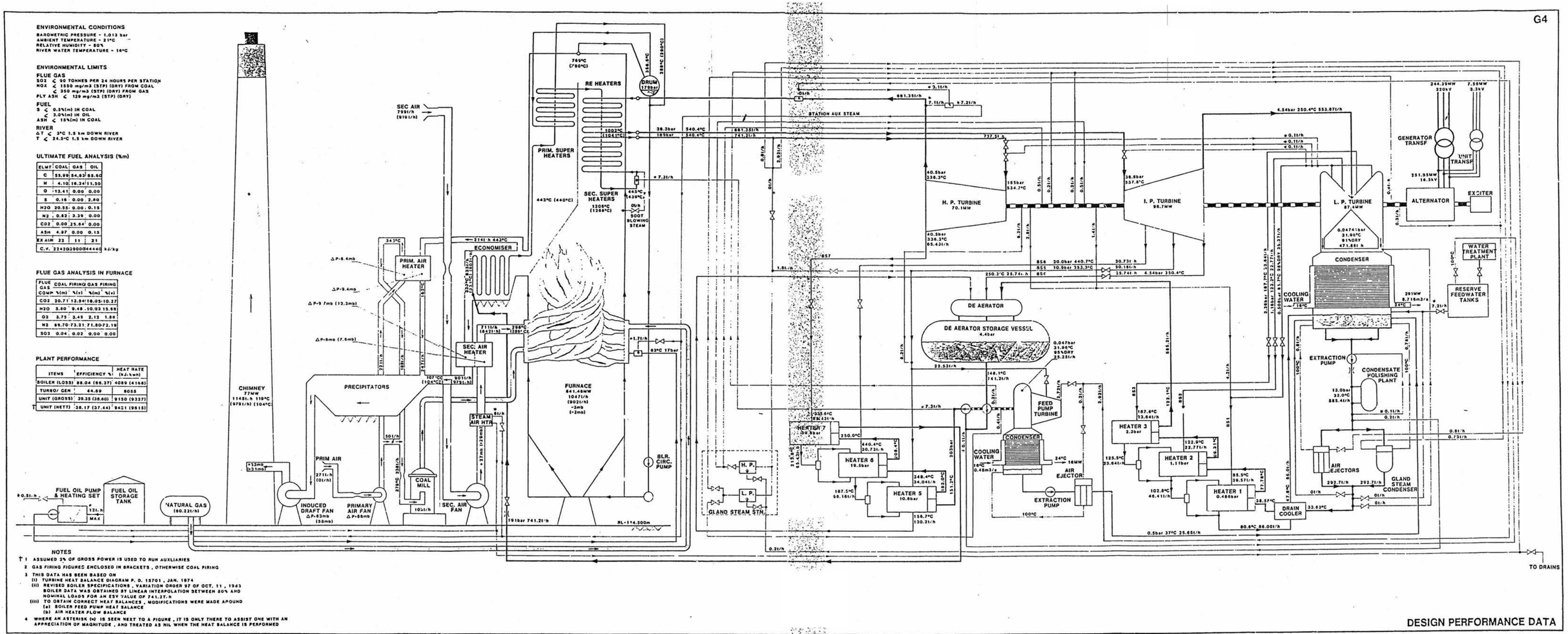
HUNTLY POWER STATION

The plant concerned in this study (Huntly power station) is the New Zealand's largest and most modern thermal power station. The first of its four generating units was commissioned in 1983 and the construction of the whole plant was completed in 1987. Huntly is a 'base-load' thermal (steam) station that can run for long periods at close to its maximum generating capability of over 6000 gigawatt hours a year.

4.1 PROCESS DESCRIPTION

The Huntly power station consists of four identical turbo-generator units, with nominal rating of 250 MW each, cooled by the Waikato river. The 250 MW (Maximum Continuous Rating) power generating units consist of a turbo-generator set and a boiler. The turbo-generator, manufactured by Parsons & Co. is a single line unit operating at 3000 r.p.m. The boiler, manufactured by Combustion Engineering Canada. is of induced draft type capable of being gas-fuel, coal, or fuel-oil fired. A schematic flowchart of the entire plant with design data is shown in Figure 19.

Figure 19 Schematic Flowchart of the Entire Plant with Design Data



4.1.1 FLUE GAS CYCLE

The coal/natural gas and air are fed into the boiler to produce very high temperature flue gases which will be used to produce superheated steam. The flue gases are then passed through the precipitator to remove dust particles (ash) by the use of a strong high voltage electrostatic field. The exhaust gases are then dispersed through the station's two 150 meter-high, double-flue chimneys.

4.1.2 STEAM CYCLE

The turbo-generator set comprises three turbines and a generator, namely, one single flow high pressure double casing turbine, one single flow intermediate pressure double casing turbine, and one double flow low pressure turbine and a hydrogen/water cooled generator. The turbine and generator shafts are rigidly coupled throughout. High pressure superheated steam is employed to drive the H.P. turbine; after expansion, the steam is exhausted via pipes to the reheaters where the temperature is raised at approximately constant pressure, and then piped to the I.P. cylinder. Exhaust steam from the I.P. turbine is passed to the L.P. cylinder inlet belts by overhead interconnecting pipes, then through the L.P. turbine in double flow to exhaust to the condenser. It is then cooled, the condensate draining to the condenser hotwell, and returned to the system by means of the extraction pump. Condensate is discharged through the air ejector and gland steam condenser to the L.P. heaters

which are heated by bled steam. On leaving L.P heater #3 the condensate is routed to the deaerator which also functions as a hotwell, or suction head tank for the Main Boiler Feed Pump. The feed pump discharges the feed water via the H.P. heaters also heated by bled steam to the boiler.

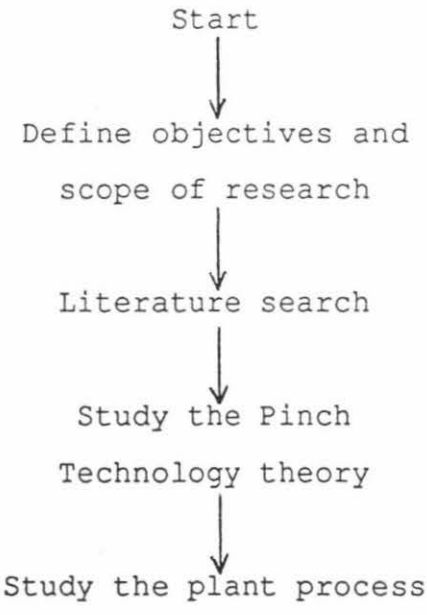
The generators produce electricity at 16.5 kV which is then stepped up by transformer to 220 kV.

SECTION 5

APPLICATION OF PINCH ANALYSIS

5.1 PREPARATORY WORK

The flowchart below shows the activities involved in approaching the research work.



After all these activities has been accomplished, the research work of applying pinch technology to Huntly power

station was then carried out. It was started with data extraction.

5.2 DATA EXTRACTION

The initial approach to data extraction implied identification of all the significant process streams.

The next step was to obtain data (i.e. enthalpy, temperature, and flowrate) for all streams and present them in a form suitable for " Pinch Analysis ". This involved calculation of CP values for all the significant streams.

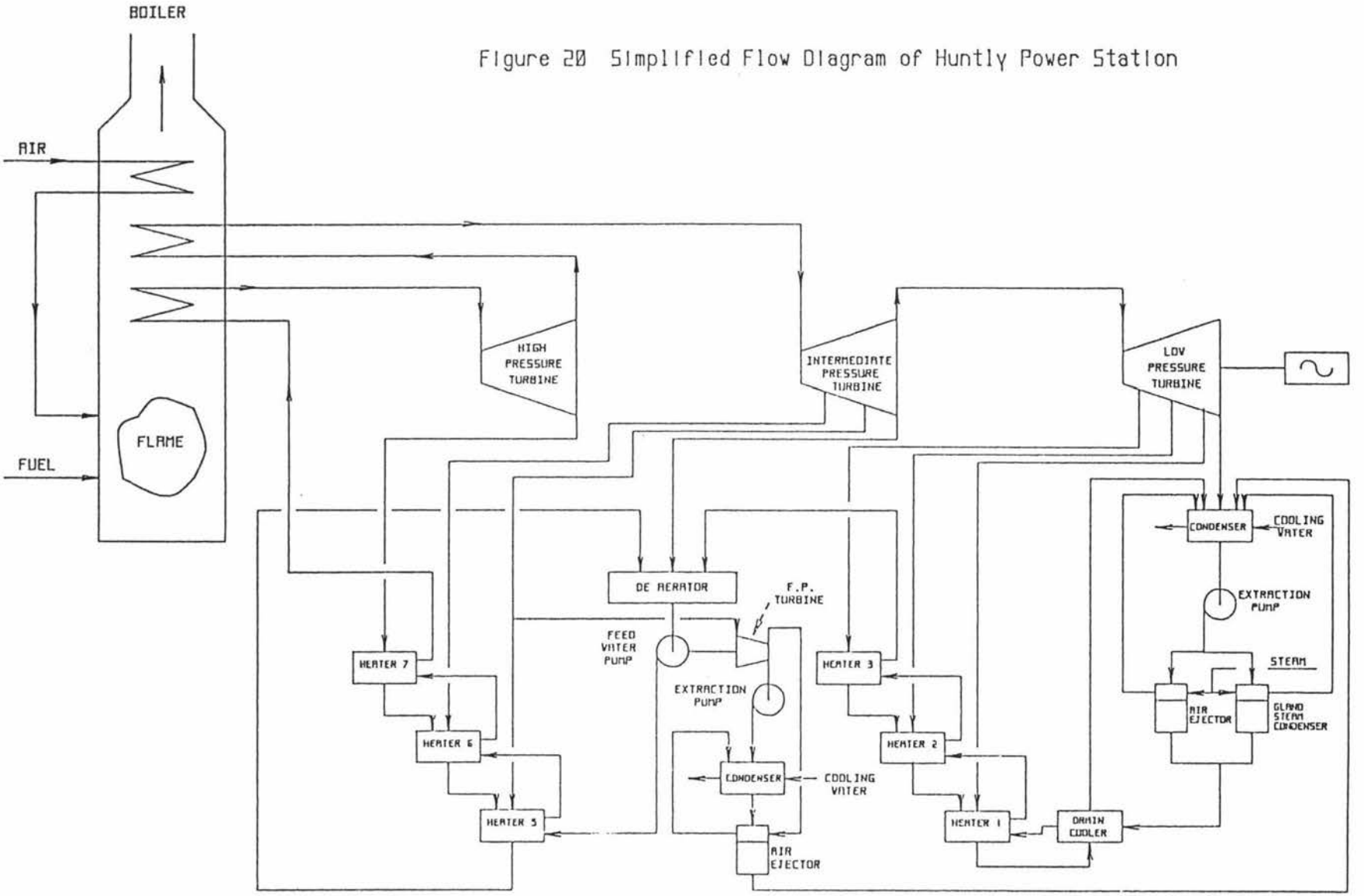
Operating data for three different power outputs were used on all the design analysis throughout this research. The data of the significant streams for the three different power outputs are listed in Appendix A1, A2, and A3 for 250 MW, 200 MW, and 150 MW power outputs respectively.

Figure 20 shows the simplified flow diagram of the plant in which only the significant process streams are outlined.

5.3 SPREADSHEET DEVELOPMENT

Initially, it was planned to use a computer software package (Hextran, Simulation Sciences INC., Fullerton, California, USA) to handle all the process analysis. However after a few trial runs it has been proved that the calculation

Figure 20 Simplified Flow Diagram of Huntly Power Station



results using Hextran were not very accurate. This is because the package is using default step size to locate the pinch point. Thus it is sometimes unable to locate the exact position of the pinch point. Table 4 shows the discrepancy between the results from Hextran and from manual calculation for different values of δT_{min}. Both methods used the same example problem described in Section 3.

Table 4 Comparison of the results from Hextran and from manual calculation.

δT_{min}	From Hextran		From manual calculation	
	Hot Utility	Cold utility	Hot Utility	Cold utility
(°C)	(MW)	(MW)	(MW)	(MW)
17	54.5	94.5	51.5	91.5
16	48.5	88.5	47.0	87.0
15	42.5	82.5	42.5	82.5
14	42.5	82.5	38.0	78.0
13	36.5	76.5	33.5	73.5
12	30.5	70.5	29.0	69.0
11	24.5	64.5	24.5	64.5
10	24.5	64.5	20.0	60.0
9	18.5	58.5	15.5	55.5
8	12.5	52.5	11.0	51.0
7	6.5	46.5	6.5	46.5
6	6.5	46.5	2.0	42.0

Owing to this reason, all the equations necessary to generate either grand composite curves or composite curves, used to undertake the pinch analysis, were set up on a microcomputer (IBM Model AT, International Business Machines Corporation, Boca Raton, Florida, USA) using a spreadsheet program (Symphony 2.0 , Lotus Development Corporation, Cambridge, MA, USA).

The floppy diskette which contains the spreadsheet used for generating the grand composite curves of the plant producing 250 MW power output (as shown in Figure 24) and the listing of its formula are given in Appendix A4.

Table 5 contains the data inputs as printed out from the diskette. This will be explained later in section 5.3.1.1.

5.3.1 DATA INPUT

5.3.1.1 GRAND COMPOSITE CURVES

The followings are the input needed for generating the grand composite curve:

1. Specification of either cold or hot stream for all the streams. '1's represent hot streams and '0's for cold streams. These are shown in column 1 of Table 5.

Table 5 Setting up the interval temperatures

δT_{min} = 10.8 (°C)

'1' Hot or '0' Cold	STREAMS	ACTUAL TEMPERATURES SOURCE (°C)	ACTUAL TEMPERATURES TARGET (°C)	INTERVAL TEMPERATURES SOURCE (°C)	INTERVAL TEMPERATURES TARGET (°C)	RANKED ORDER (°C)	CP (MW/°C)
1	2	3	4	5	6	7	8
1	Heater #7	335.07	250	329.67	244.6	1889.64	-0.05555
1	Heater #7	250	249.9	244.6	244.5	1310.27	-311.655
1	Heater #7	249.9	213.83	244.5	208.43	1120.254	-0.08557
1	Heater #6	441.75	208.4	436.35	203	845.699	-0.01998
1	Heater #6	208.4	208.3	203	202.9	545.79	-162.600
1	Heater #6	208.3	187.54	202.9	182.14	543.42	-0.12039
1	Heater #6	213.83	208.4	208.43	203	450.4	-0.08534
1	Heater #5	348.421	182.42	343.021	177.02	444.6	-0.02137
1	Heater #5	182.42	182.32	177.02	176.92	436.35	-189.651
1	Heater #5	182.32	156.72	176.92	151.32	361.897	-0.15840
1	Heater #5	187.54	182.42	182.14	177.02	348.4	-0.12144
1	Deaerator	249.977	148.1	244.577	142.7	343.021	-0.01532
1	Deaerator	148.1	148	142.7	142.6	341.71	-151.590
1	Deaerator	156.72	148.1	151.32	142.7	332.6	-0.15701
1	Heater #3	187.74	125.54	182.34	120.14	329.67	-0.01368
1	Heater #3	125.54	125.44	120.14	120.04	307.4	-143.805
1	Heater #2	122.909	102.825	117.509	97.425	286.4	-0.01265
1	Heater #2	102.825	102.725	97.425	97.325	272.578	-142.091
1	Heater #2	125.54	102.825	120.14	97.425	255.44	-0.02783
1	Heater #1	86.102	80.57	80.702	75.17	244.6	-0.02110
1	Heater #1	80.57	80.47	75.17	75.07	244.577	-225.556
1	Heater #1	102.85	80.57	97.45	75.17	244.5	-0.05413
1	Drain Cooler	80.46	47.322	75.06	41.922	213.83	-0.09995
1	Furnace Wall	1895.04	1315.67	1889.64	1310.27	208.43	-0.34388
1	Furnace Wall	1895.04	450	1889.64	444.6	203	-0.04592
1	SSH	1315.67	1125.654	1310.27	1120.25	202.9	-0.32693
1	Reheater	1125.654	851.099	1120.254	845.699	187.35	-0.31659
1	PSH	851.099	450	845.699	444.6	182.34	-0.29856
1	Economiser	450	338	444.6	332.6	182.14	-0.27569
1	Secondary Air	338	120	332.6	114.6	177.02	-0.27489
1	Primary Air	450	160	444.6	154.6	176.92	-0.05459

TABLE 5 Continue.....

1	Condenser	31.8	31.7	26.4	26.3	165.4	-2893.45
1	Condenser	47.322	31.8	41.922	26.4	156.56	-0.09989
1	Condenser	99.068	31.8	93.668	26.4	154.6	-0.00091
1	Condenser	56.24	31.8	50.84	26.4	153.4	-0.00026
1	Condenser	79.654	31.8	74.254	26.4	151.32	-0.00025
1	Condenser	99.632	31.8	94.232	26.4	142.7	-0.00024
1	Condenser	37.168	31.8	31.768	26.4	142.6	-0.02994
1	BFPT Condenser	31.8	31.7	26.4	26.3	127.492	-162.272
1	BFPT Condenser	59.76	31.8	54.36	26.4	125.4	-0.00010
1	BFPT Condenser	99.632	31.8	94.232	26.4	120.14	-0.00010
0	Drain Cooler	33.63	38.54	39.03	43.94	120.04	0.674325
0	Heater #1	38.54	77.783	43.94	83.183	117.509	0.679393
0	Heater #2	77.783	99.91	83.183	105.31	114.6	0.682275
0	Heater #3	99.91	122.092	105.31	127.492	105.31	0.686739
0	Deaerator	122.092	148	127.492	153.4	97.45	0.697890
0	Heater #5	151.16	181.95	156.56	187.35	97.425	0.883121
0	Heater #6	181.95	208.43	187.35	213.83	97.325	0.902002
0	Heater #7	208.43	250.04	213.83	255.44	94.232	0.936730
0	Economiser	250.04	281	255.44	286.4	93.668	0.997365
0	Furnace Wall	281	356.497	286.4	361.897	83.183	3.493330
0	PSH	356.497	445	361.897	450.4	80.702	1.353089
0	SSH	445	540.39	450.4	545.79	75.17	0.651277
0	Reheater	336.31	538.02	341.71	543.42	75.07	0.430930
0	Primary Air	21	343	26.4	348.4	75.06	0.047696
0	Primary Air	21	160	26.4	165.4	74.254	0.010543
0	Secondary Air	21	302	26.4	307.4	54.36	0.098497
0	Secondary Air	21	267.178	26.4	272.578	50.84	0.111858
0	Secondary Air	21	120	26.4	125.4	43.94	0.046360
						41.922	
						39.03	
						31.768	
						26.4	
						26.3	

Where PSH = Primary Superheater
SSH = Secondary Superheater
BFPT = Boiler Feed Pump Turbine

Note:

All interval temperatures in column 5 and 6 were ranked and placed on column 7. At the same time duplicate temperatures were removed.

2. Actual stream source temperatures as shown in column 3 of Table 5.
3. Actual stream target temperatures as shown in column 4 of Table 5.
4. Stream heat capacity flowrate (CP) values as shown in column 8 of Table 5. The CP values of all the hot streams have to be negative values and vice versa for the CP values of all the cold streams.
5. The δT_{min} value as shown on the second line from the top of the Table 5.

5.3.1.2 COMPOSITE CURVES

To generate a composite curve we have to generate a hot composite curve and a cold composite curve seperately. The input requirements are the same as those listed in the previous section except that :

1. The δT_{min} value is set to zero.
2. In order to produce a hot composite curve, all actual source temperatures, actual target temperatures and CP values of cold streams are set to zero. The CP values of all the hot streams have to be positive values.
3. In order to produce a cold composite curve, all actual source temperatures, actual target temperatures and CP values of hot streams are set to zero. The CP values of all the cold streams have to be positive values.

The curves are then combined together on the same temperature vs heat content diagram to produce composite curves.

5.3.1.4 STARTING THE SPREADSHEET

A macro program was written and assigned to F7 key. The macro consists of a series of instructions which enable the spreadsheet to automatically calculate the necessary data which are used for plotting a curve. The instructions are based on the calculation procedures described in chapter 3. The listing of the macro is given in Appendix A4. Press F7 key twice in order to execute the macro.

SECTION 6

RESULTS AND DISCUSSION

6.1 COMPOSITES CURVE

The data from the pinch analysis were plotted on a temperature-heat content diagram to produce the composite hot and cold curves. The composite curves for Huntly power station producing 250 MW power output is shown in Figure 21. At the bottom end the horizontal distance between the lines is the minimum cooling required by the process. At all points in between (where the curves overlap in a vertical sense) the heating and cooling duties can be satisfied by heat transfer between the hot streams and cold streams. Latent heat changes shows up as horizontal lines.

The curves show the position of the pinch. It is located at the 26.4 °C interval boundary temperature (i.e. hot steam at 31.8 °C and cold at 21 °C). This means that the δT_{min} of the base case design producing 250 MW power output is 10.8 °C if the stream matches between the composite curves are 'vertical'.

The composites curves for the plant when running at two other different power outputs 200 MW and 150 MW are shown in Figure 22 and Figure 23 respectively.

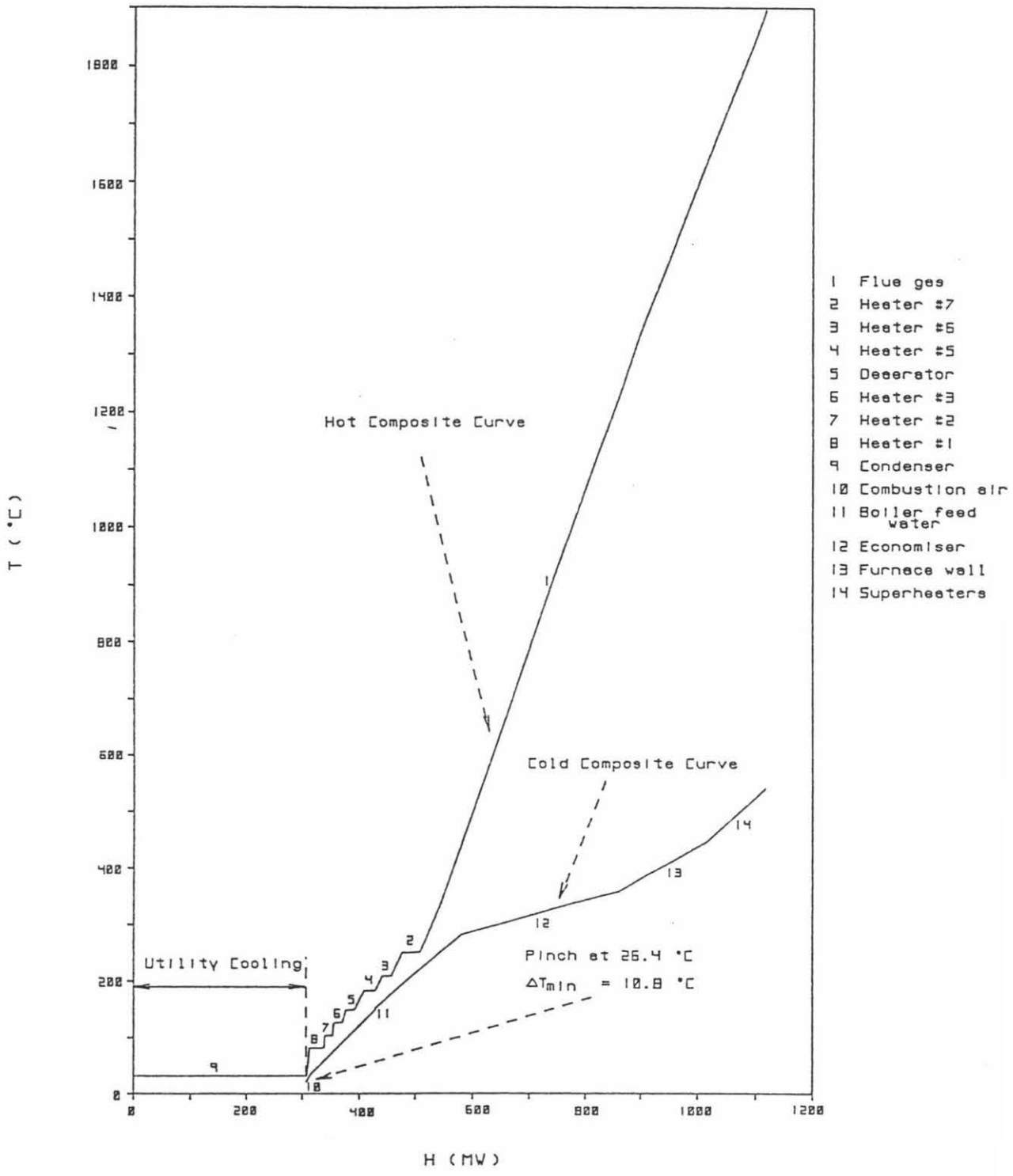


Figure 21 Composite Curves of the Plant Producing 250 MW Power Output

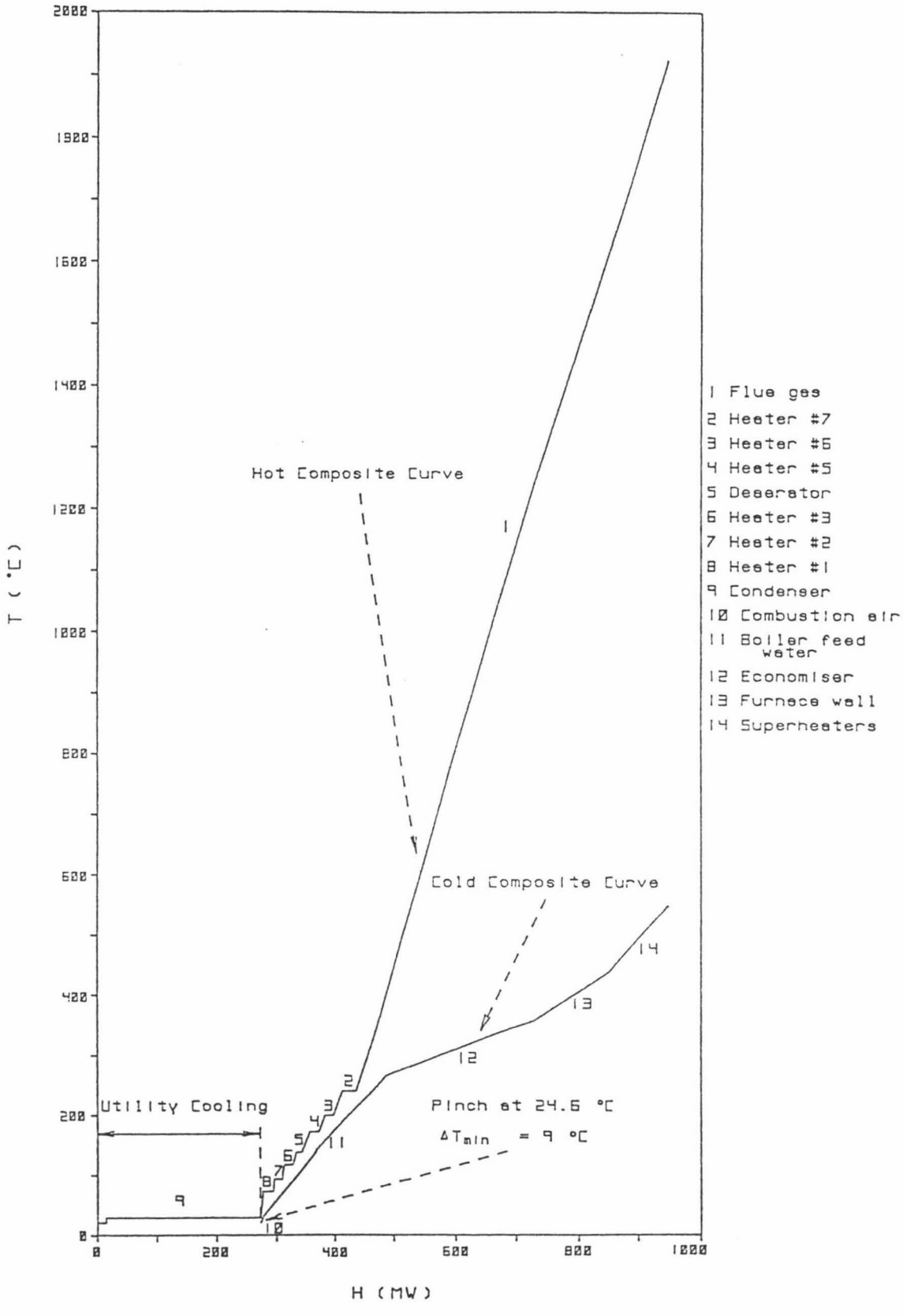


Figure 22 Composite Curves of the Plant Producing 200 MW Power Output

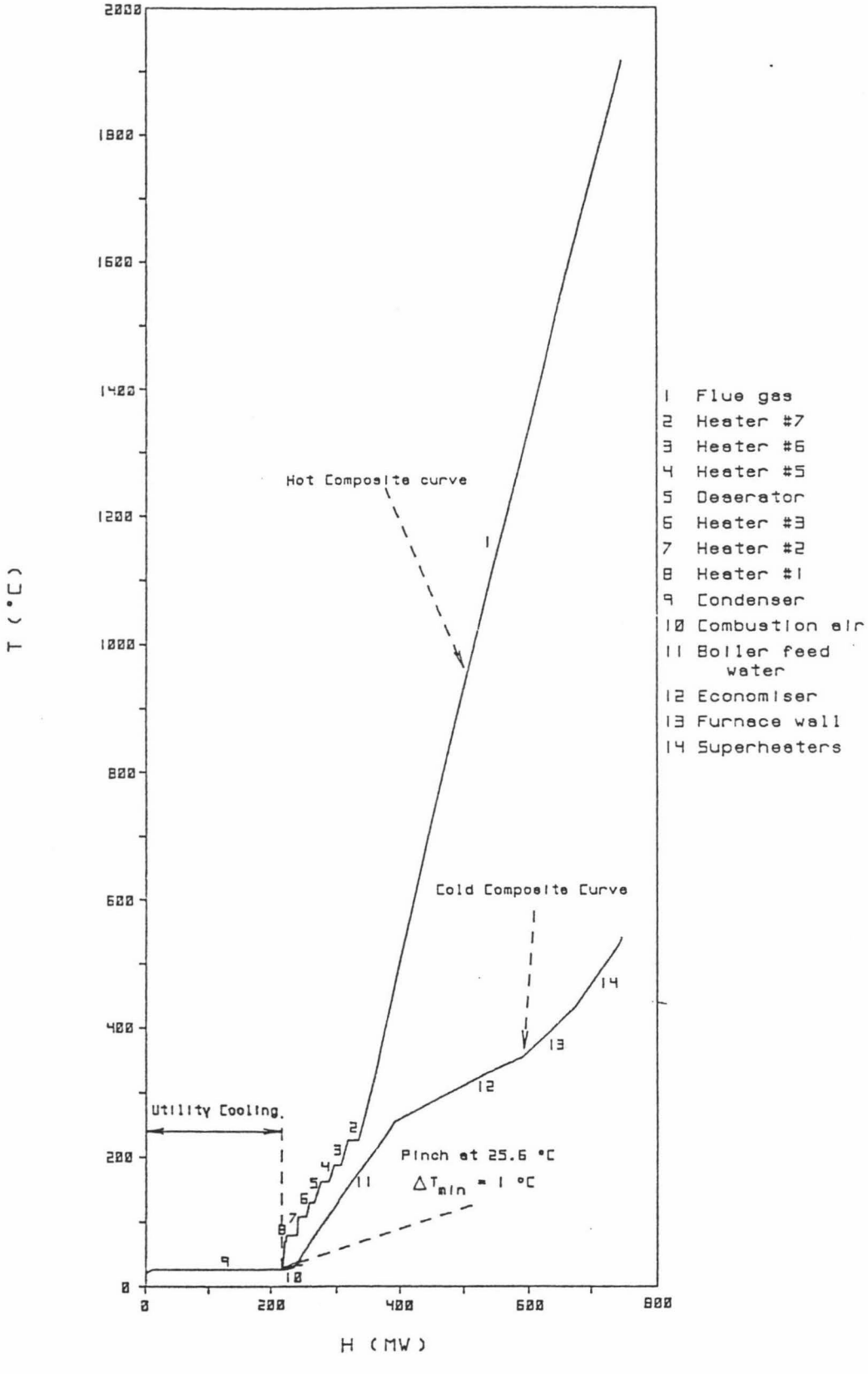


Figure 23 Composite Curves of the Plant Producing 150 MW Power Output

Figure 22 shows that the pinch point is at 24.6 °C interval boundary temperature (i.e. hot stream at 29.1 °C and cold at 20.1 °C). This means that the δT_{min} of the base case design producing 200 MW power output is 9 °C.

Figure 23 shows that the pinch point is at 25.6 °C interval boundary temperature (i.e. hot stream at 26.1 °C and cold at 25.1). This means that the δT_{min} of the base case design producing 150 MW power output is 1 °C.

An alternative method to analyse at the same information is to plot the net heat flow at each of the adjusted temperature interval boundaries to generate a grand composite curve as shown in Figure 24 (250 MW power output). This showed more clearly where the pinch lies (at 26.4 °C). Figure 25 and Figure 26 illustrate the cases for 200 MW (pinch at 24.6 °C) and 150 MW (pinch at 25.6 °C) respectively. All the input and calculated data for plotting the grand composite curves are given in Appendix A8 except the input data for plotting the grand composite curve of the plant producing 250 MW power output. The input data is shown in Table 5.

By examining the composite curves (shown in Figure 21), process flowchart (shown in Figure 20) and process data (shown in Appendix A1), it was found that the stream matches are not 'vertical' between the composite curves. It has been stated in the literature on pinch technology (B. Linnhoff and T.N. Tjoe, 1986) that the net effect of such 'criss-crossing' is an increase in the area requirement. Moreover,

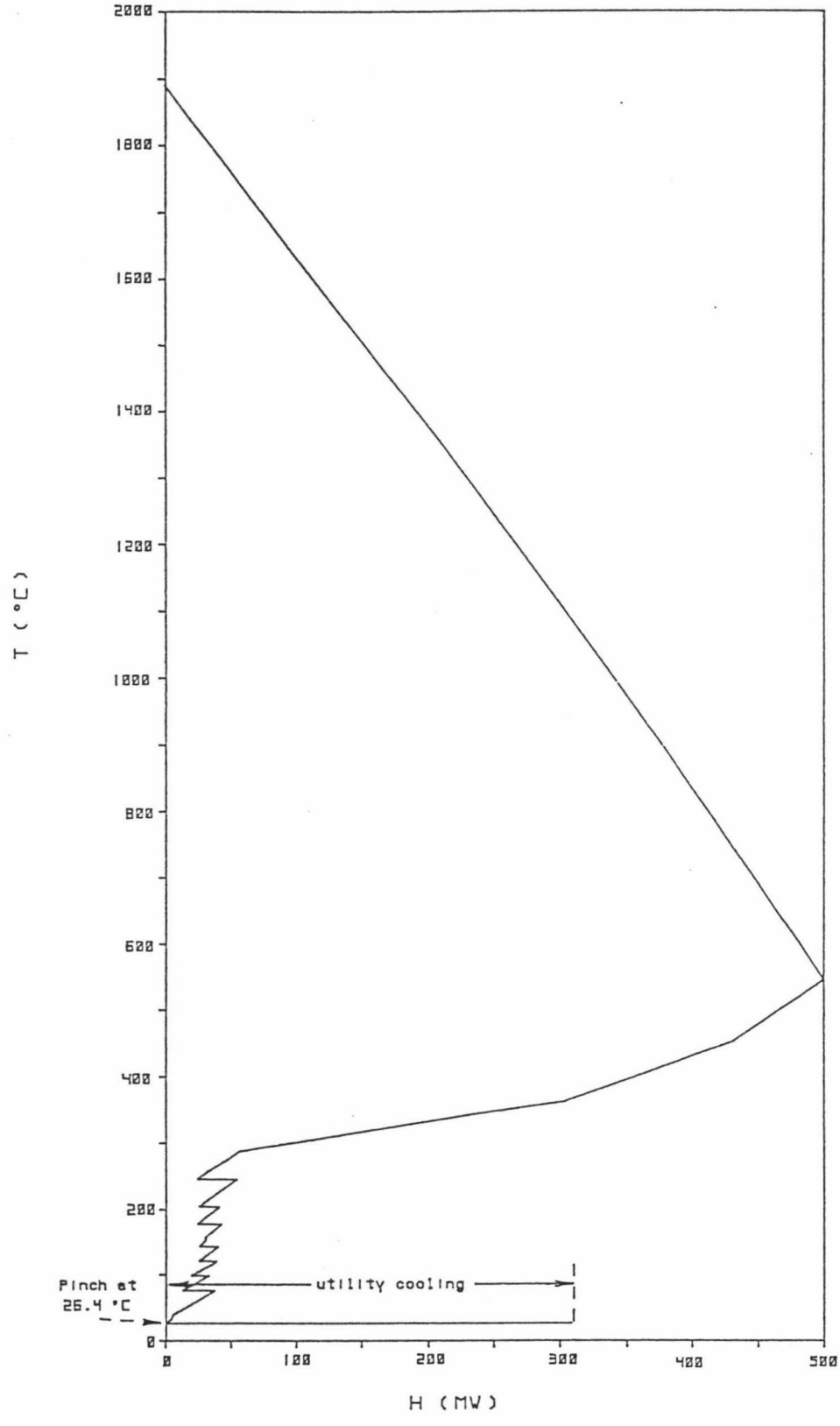


Figure 24 Grand Composite Curves of the Plant Producing 250 MW Power Output

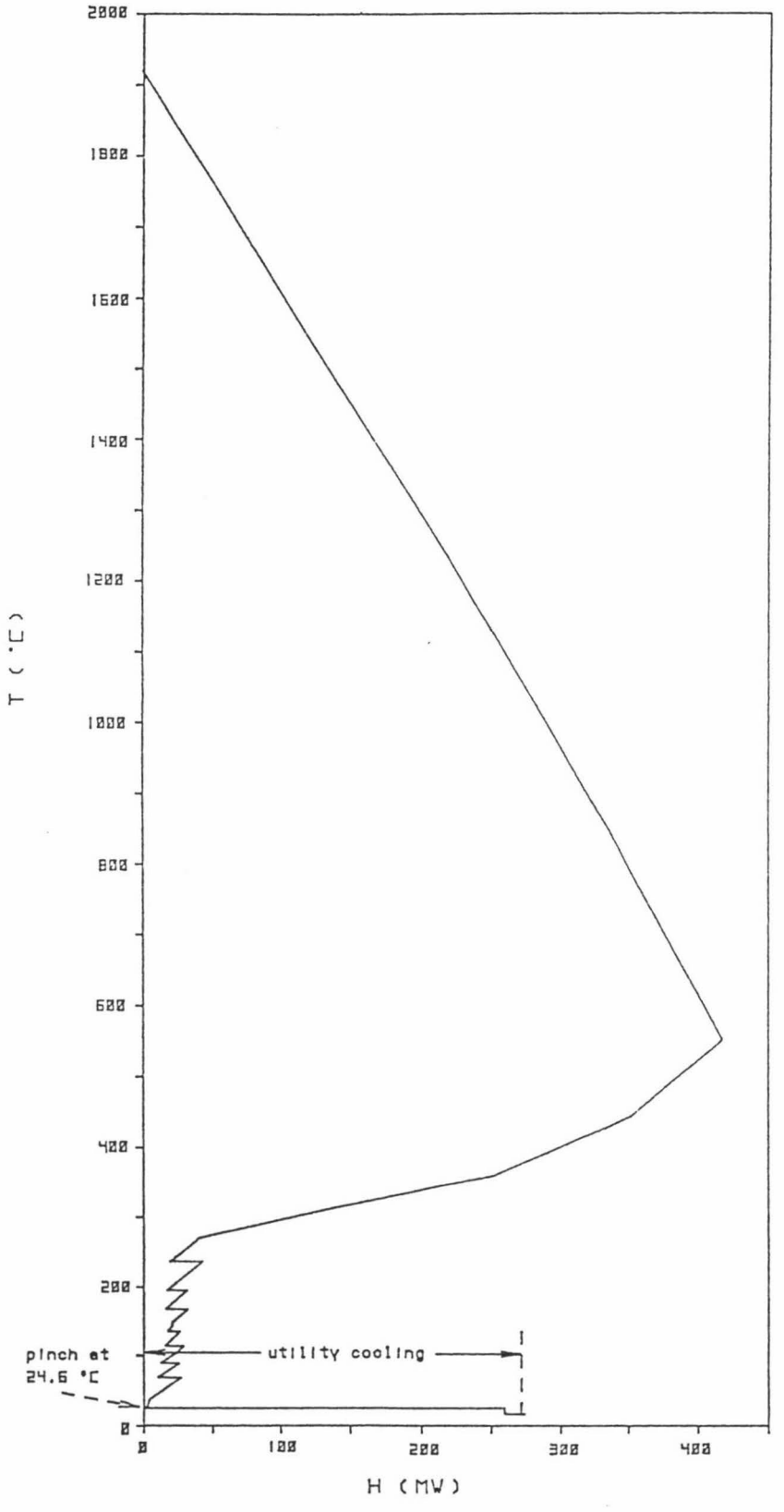


Figure 25 Grand Composite Curves of the Plant Producing 200 MW Power Output

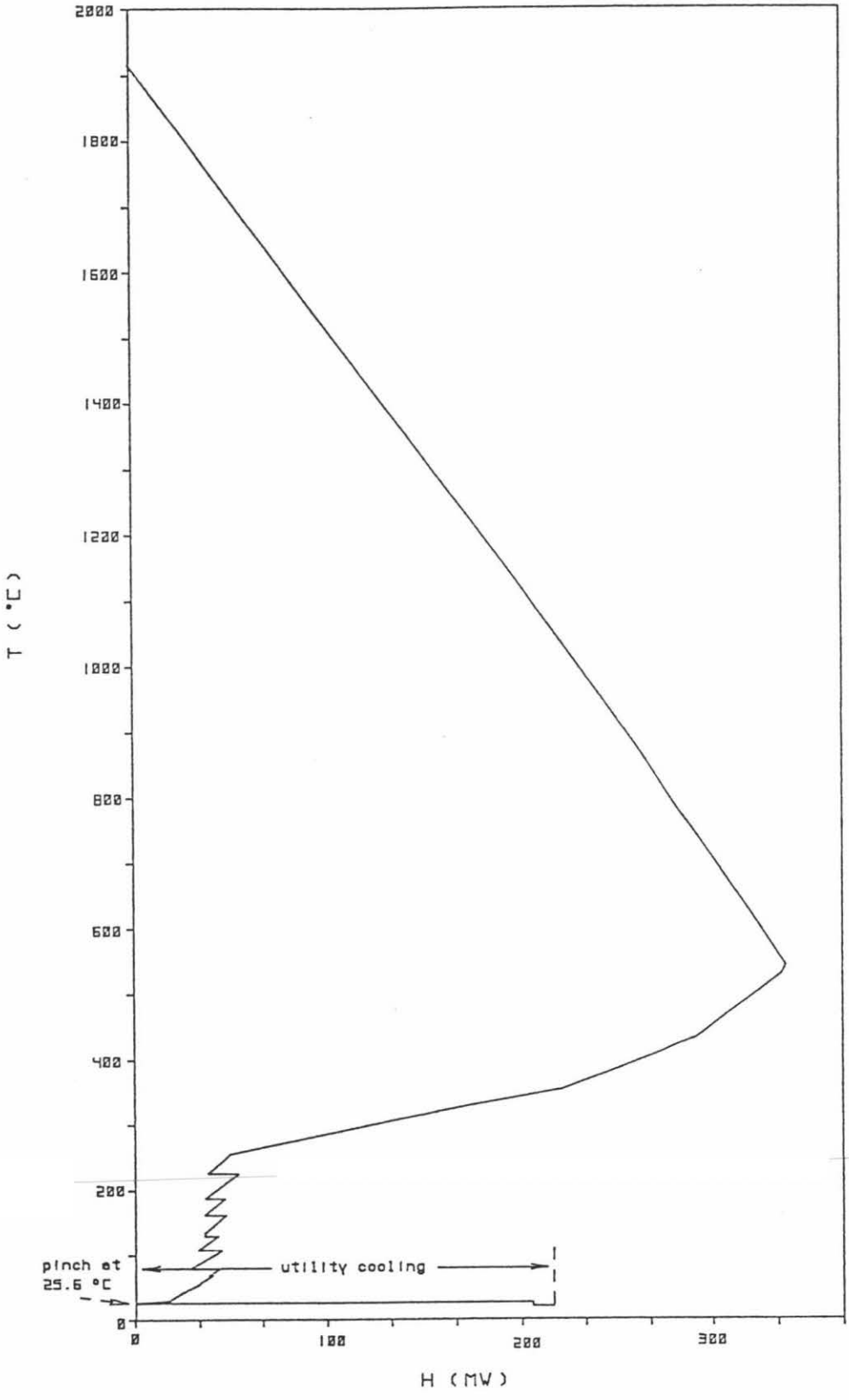


Figure 25 Grand Composite Curves of the Plant Producing 150 MW Power Output

criss-crossing can also cause a smaller δT_{min} (the smallest observed δT_{min} in the heat exchanger is approximately 2.5 °C, i.e. match between bled steam and feed water in the heater #2, compared to 10.8 °C when the stream matches are 'vertical' between the composite curves). If the criss-crossing can be removed, it will result in a smaller heat exchange area requirement. It will also open up an opportunity for energy saving as the δT_{min} will now be 10.8 °C instead of 2.5 °C. This means that we can shift the composite curves closer together and rematch all the necesary streams. Thus this increases the heat exchange between the process. In other words, we should try to improve on the ineffective use of area due to the criss-crossing, while shifting the composite curves closer to save energy.

The same situations were encountered when the plant produces power output at 200 MW and 150 MW. For the 200 MW, the smallest observed δT_{min} is approximately 0.3 °C, i.e. match between bled steam and feed water in the heater #2, compared to 9 °C when the stream matches are ' vertical ' between the curves. For the 150 MW, the smallest observed δT_{min} is approximately 0.1 °C, i.e. match between bled steam and feed water in the heater #2, compare to 1 °C when the stream matches are 'vertical ' between the curves.

However, the improvements on the overall energy consumptions by removing the criss-crossing stream matches and shifting the composite curves closer can be misjudged by just

analysing at the higher power output (i.e. 200 MW and 250 MW). For instance, by reducing the δT_{min} by 5 °C from 10.8 °C and 9 °C to 5.8 °C and 4 °C respectively to increase the heat exchange between the process. The 5 °C reduction of δT_{min} of course is too large when considering the plant producing power at 150 MW. The δT_{min} is only 1 °C even when stream matches are 'vertical' between the composite curves. This small δT_{min} value is caused by the high air inlet temperature and low exhaust steam temperature (the pinch point is created by these two streams). Here it is clearly shown that shifting the composite closer by 5 °C is not possible.

The elimination of the criss-crossing by itself will only decrease the area of heat transfer. It is not worthwhile if there is no possibility of energy saving. Hence it will be uneconomical to throw away extra area that has already been paid for.

The result has proven that there is no potential for improvement in operating efficiency.

Here we can perceive the weakness of using Pinch technology on the plant which has variable flowrate and temperatures throughout the process, since constant values are assumed throughout the process when the Pinch concept is applied. The potential improvement in efficiency can be easily misjudged by someone who is not careful utilising the pinch technology in this situation. The resulting design will be infeasible.

6.2 GRID REPRESENTATION

The existing networks were drawn on the grid (using δT_{min} identified from the composite curves) to find heat exchangers crossing the pinch. The results are shown on Figure 27, Figure 28 and Figure 29 for the existing process producing three different power outputs i.e. 250 MW, 200 MW and 150 MW respectively.

On the grid diagram, the pinch is shown as the vertical dotted line with the pinch temperature located at the top and bottom for hot streams and cold streams respectively. Hot streams are represented as horizontal lines, from left to right. Similarly, cold streams are shown as horizontal lines, from right to left. Heat exchangers are shown as circles connected by vertical lines. Circles connected by a diagonal line indicate cross-pinch heat exchangers that cause excess utility consumption.

The key concepts of pinch technology are :

1. do not transfer heat across the pinch.
2. do not use cold utilities above the pinch,
3. do not use hot utilities below the pinch.

A design that follows these three basic rules is guaranteed to achieve the hot and cold energy targets.

All the grid diagrams shown in Figure 27, 28 and 29 for 250 MW, 200 MW and 150 MW power output respectively showed that

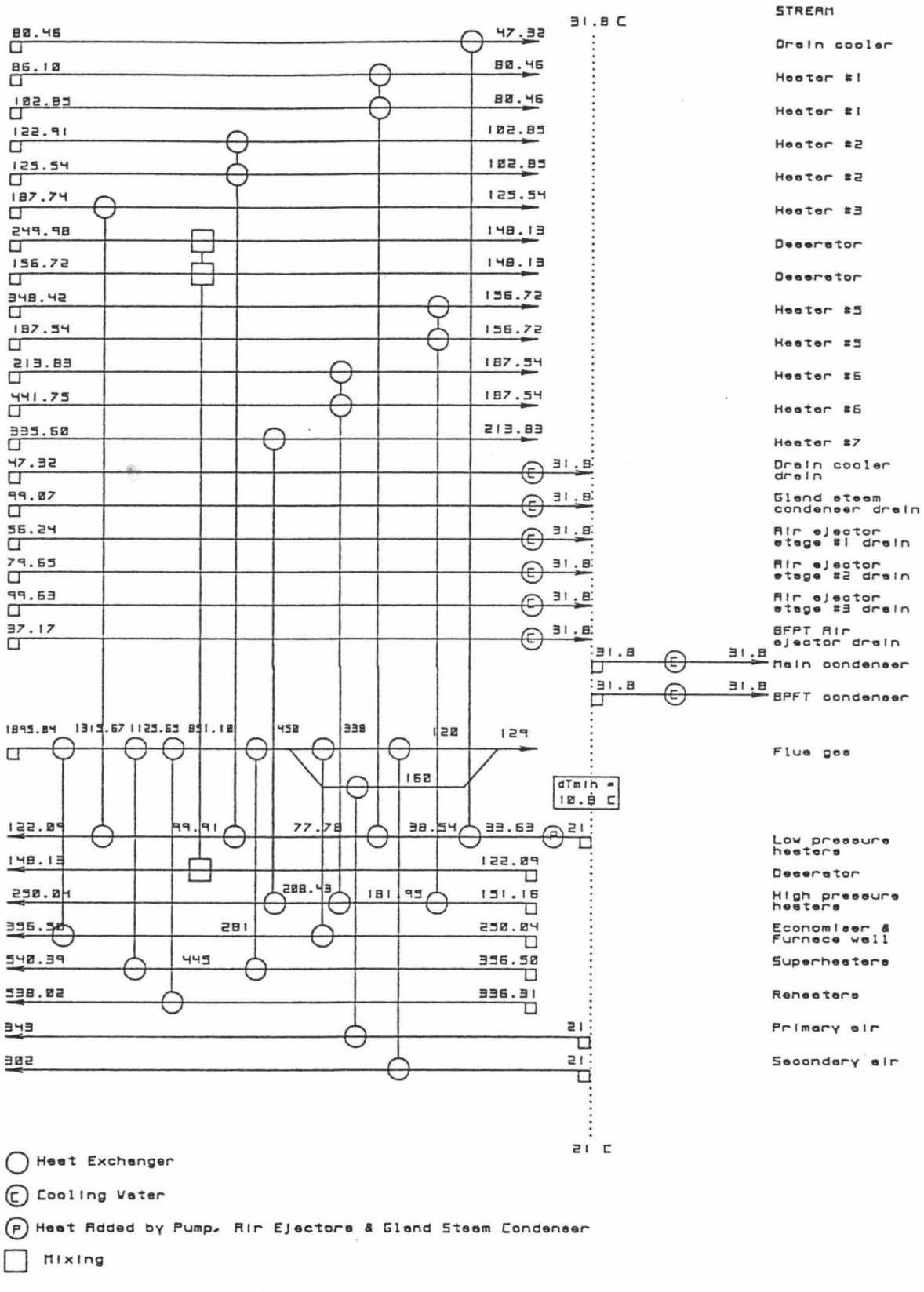


Figure 27 Grid Representation of the Plant Producing 250 MW Power Output

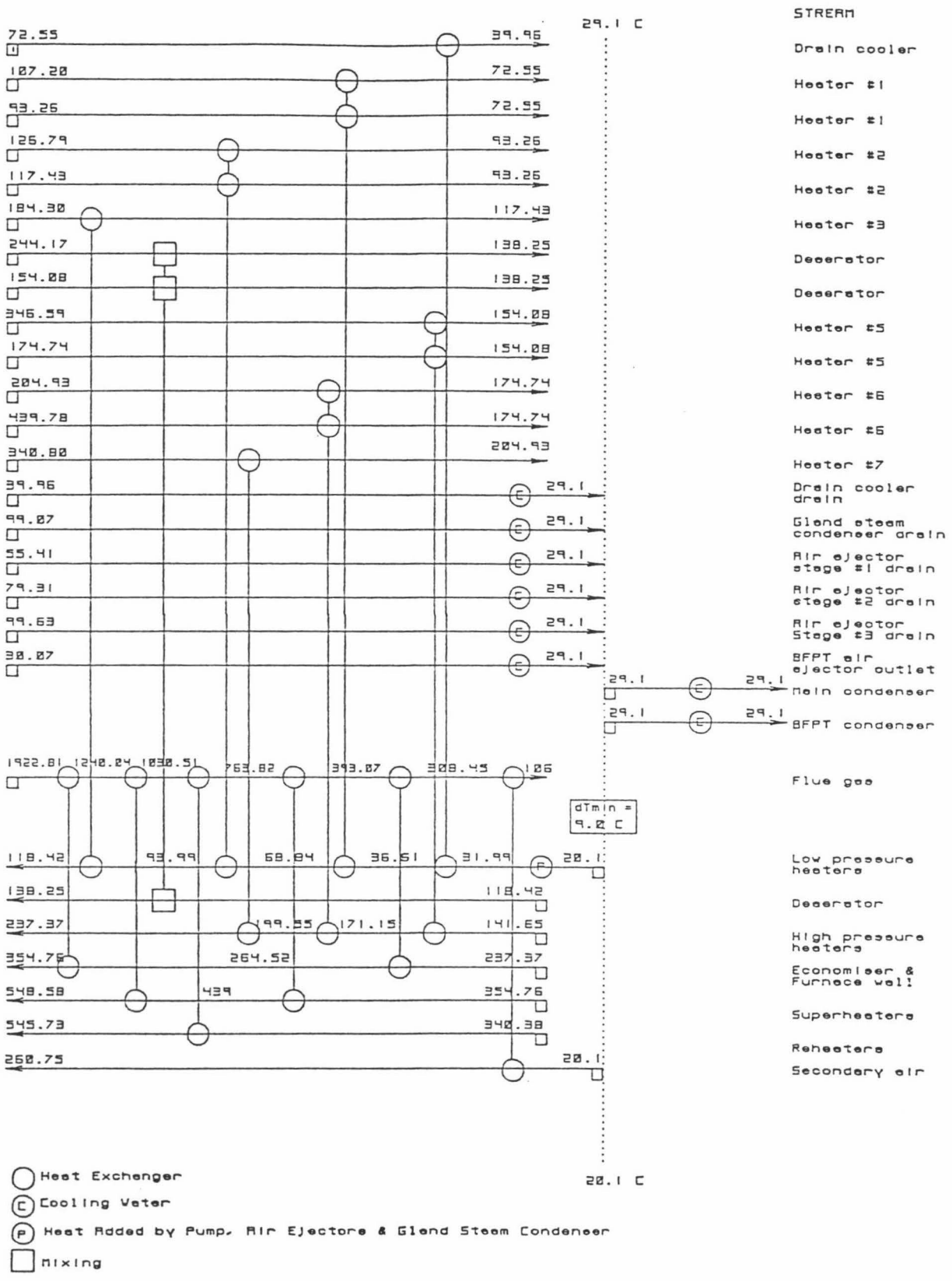


Figure 28 Grid Representation of the Plant Producing 200 MW Power Output

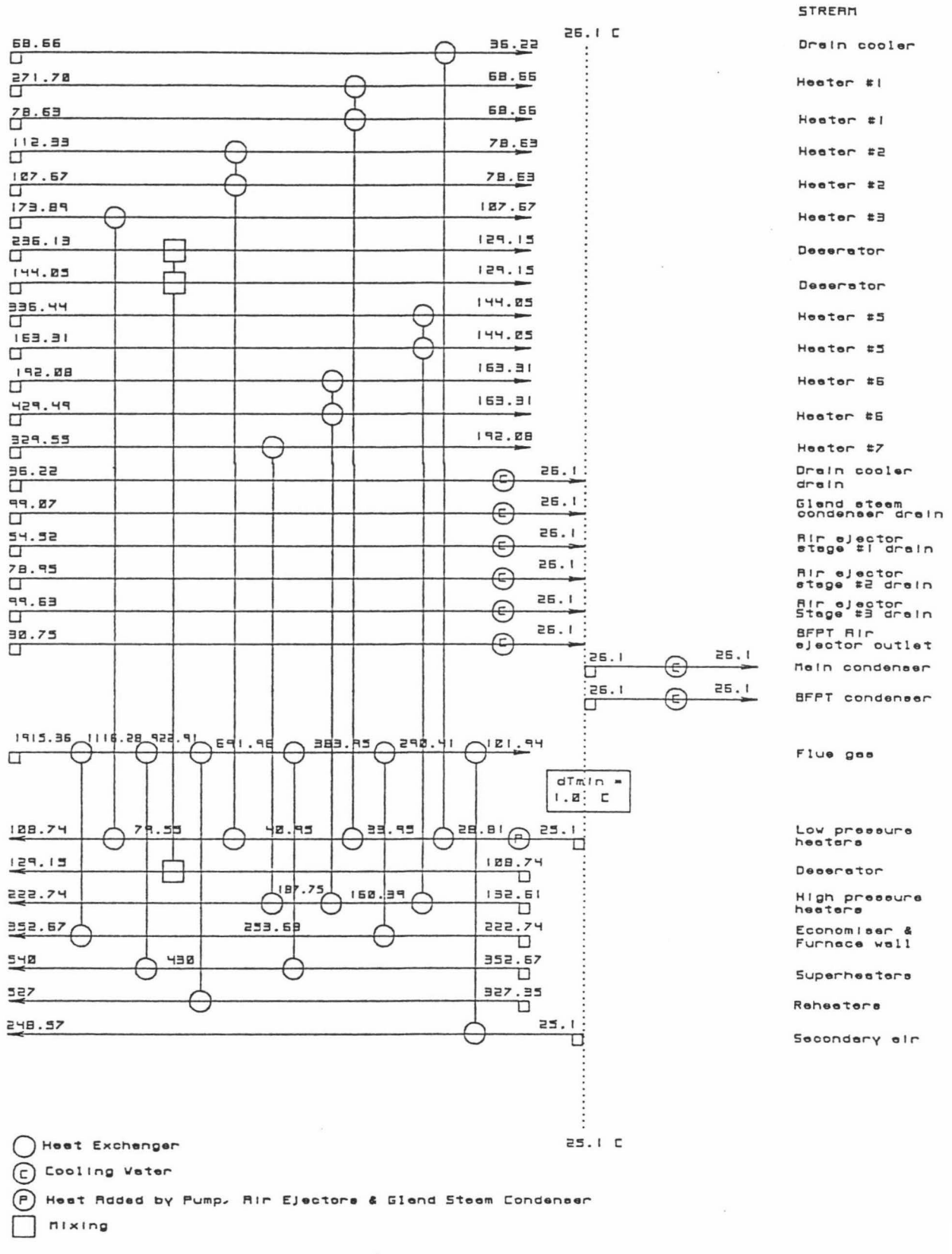


Figure 29 Grid Representation of the Plant Producing 150 MW Power Output

there are six streams (four from air ejectors, one from gland steam condenser and one from drain cooler drain) used cold utilities above the pinch. In order to achieve the minimum energy target, all these cold utilities have to be dispersed.

The existing method feeds all these streams back to the condenser wasting all the heat contents in these streams via the cooling water. One possible suggested improvement is to mix all these streams in a mixing vessel and then pump the hot mixture stream back to the main stream. The main stream has been cooled down by the cooling water in the condenser and passed through the extraction pump. The pressure of the vessel should be the same as the lowest stream pressure . It allows all the streams to flow into the vessel without needing pumps.

Figure 30 shows the modified section of the plant (refer to Figure 20 for the original section of the plant).

Table 6 shows the resulting net increase in power outputs for three different loads (150 MW, 200 MW and 250 MW). The details of the calculations are shown in Appendix A5.

Table 7 shows the total saving per year in terms of dollars as the results of the increased in power outputs. The details of the calculations for three different loads (250 MW, 200 MW and 150 MW) are shown in Appendix A6.

These two tables show that the saving is very low especially

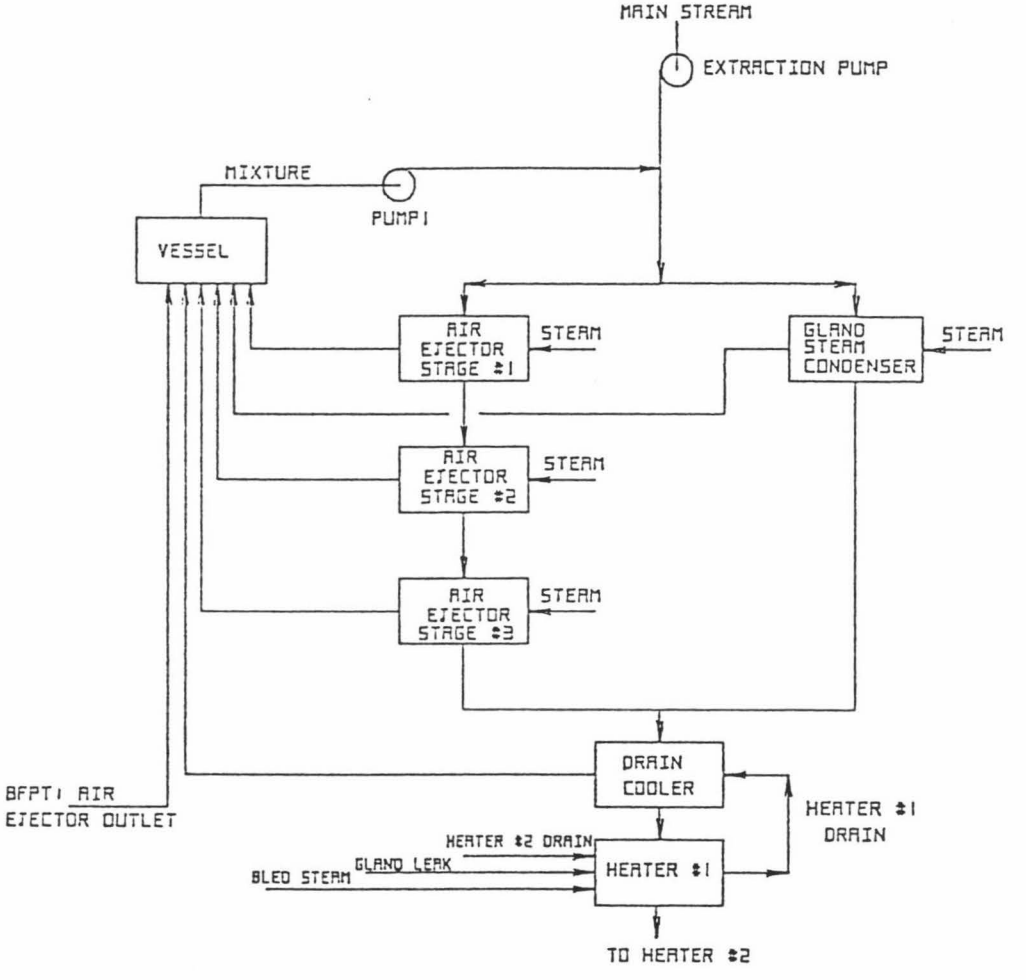


Figure 30 Modified Section of the Plant

for 200 MW and 150 MW. Therefore it may not be viable to go ahead with the plant modification as the pay back period will be very long depending on the plant retrofit cost (capital, labour, downtime etc).

Table 6 The net increased in power outputs as the results of plant modification.

Power loads (MW)	Pumping power (kW)	Increased in power output (kW)	Net increased in power output (kW)	(%)
250	82	378	296	0.1184
200	88	176	88	0.044
150	70	155	85	0.0567

Table 7 The total saving per year

Total power output (MW)	Total saving per year (NZ$)
4 x 250	129 000
4 x 200	38 000
4 x 150	37 000

SECTION 7

THE IDENTIFIED AREAS OF IMPROVEMENT

Previous chapter has identified two areas of improvement:

1. It was found that the stream matches are not 'vertical' between the composite curves. If these non 'vertical' matches can be removed, it will result in a smaller heat exchange area requirement. This also means that the composite curves can be shifted closer together to increase the heat exchange between the process and hence energy saving.

2. It also was found that there are six streams above the pinch using cold utilities. Thus the operating efficiency can be improved by modifying the process so that none of these streams used cold utilities above the pinch.

However, the results showed that the possible improvement in efficiency is not large enough to justify the extra complexity in the design.

The next chapter illustrates the pinch method used to identify other possible areas for improvement that are otherwise not apparent from the process flowchart. However, all the calculations will be based on the conventional method instead of the pinch method.

SECTION 8

OTHER POSSIBLE AREAS OF IMPROVEMENT

8.1 EXCHANGE THE BLED STEAM TO HEATER #7 WITH THE BLED STEAM TO HEATER #6

The process flowchart (shown in Figure 20) and the process data (shown in Appendix A1, A2 and A3) were examined. It has been found that the bled steam from the intermediate pressure turbine has a higher temperature than the bled steam from high pressure turbine. The bled steam from the intermediate pressure turbine was used to heat up heater #6 which has a lower temperature than heater #7. The bled steam from the high pressure turbine was used to heat up heater #7. Further consideration showed that this was more sensible when the bled steam with a higher temperature was used to heat up the heater with a higher temperature.

The situation was thoroughly examined in order to validify the case.

8.1.1 RESULTS AND DISCUSSION

Plots of temperature vs heat content for all the bled steams and feed water that went into all the heaters for 250 MW, 200 MW and 150 MW power outputs are shown in Figure 31, 32 and 33 respectively.

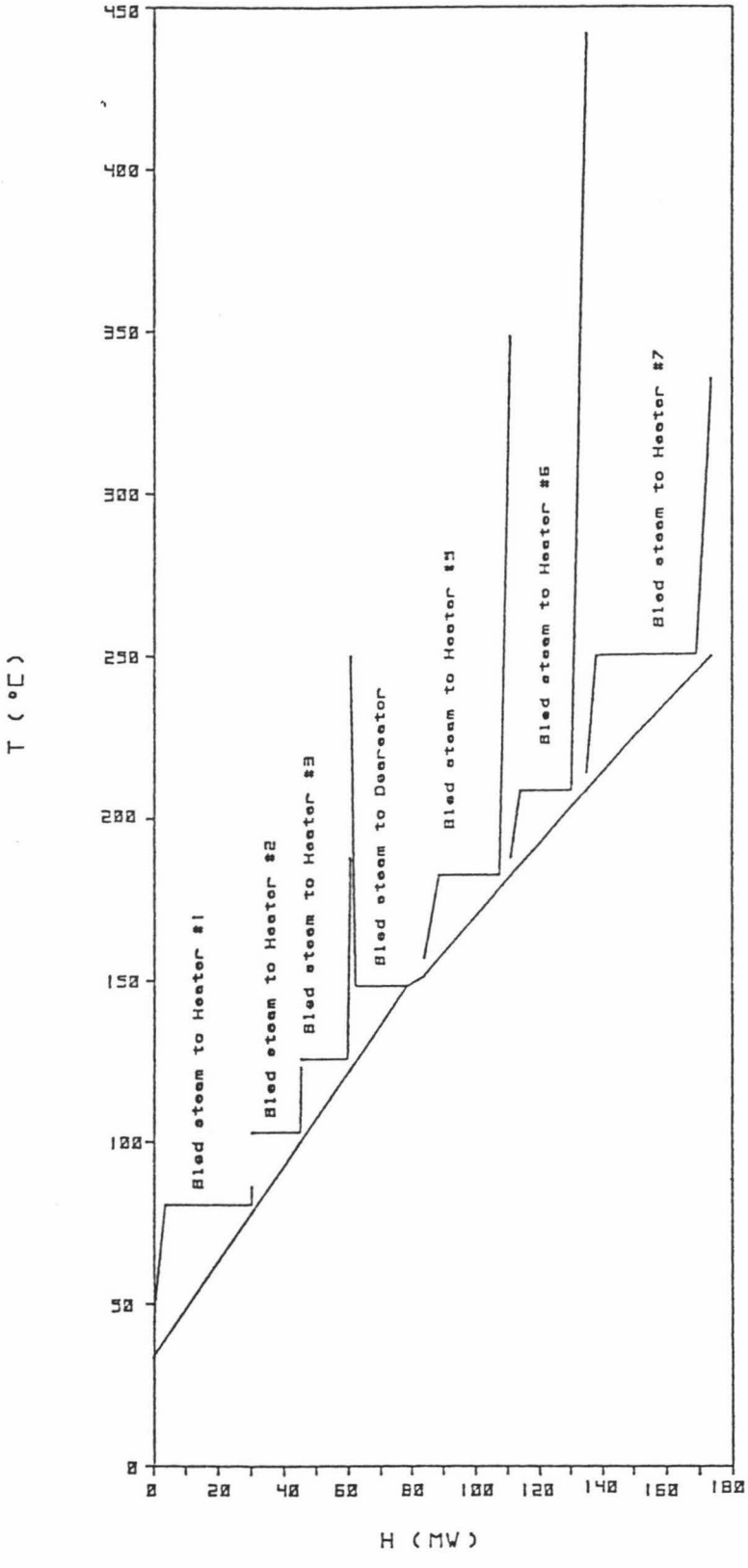


Figure 31 Feed Water Heating with Bled Steams (250 MW Power Output)

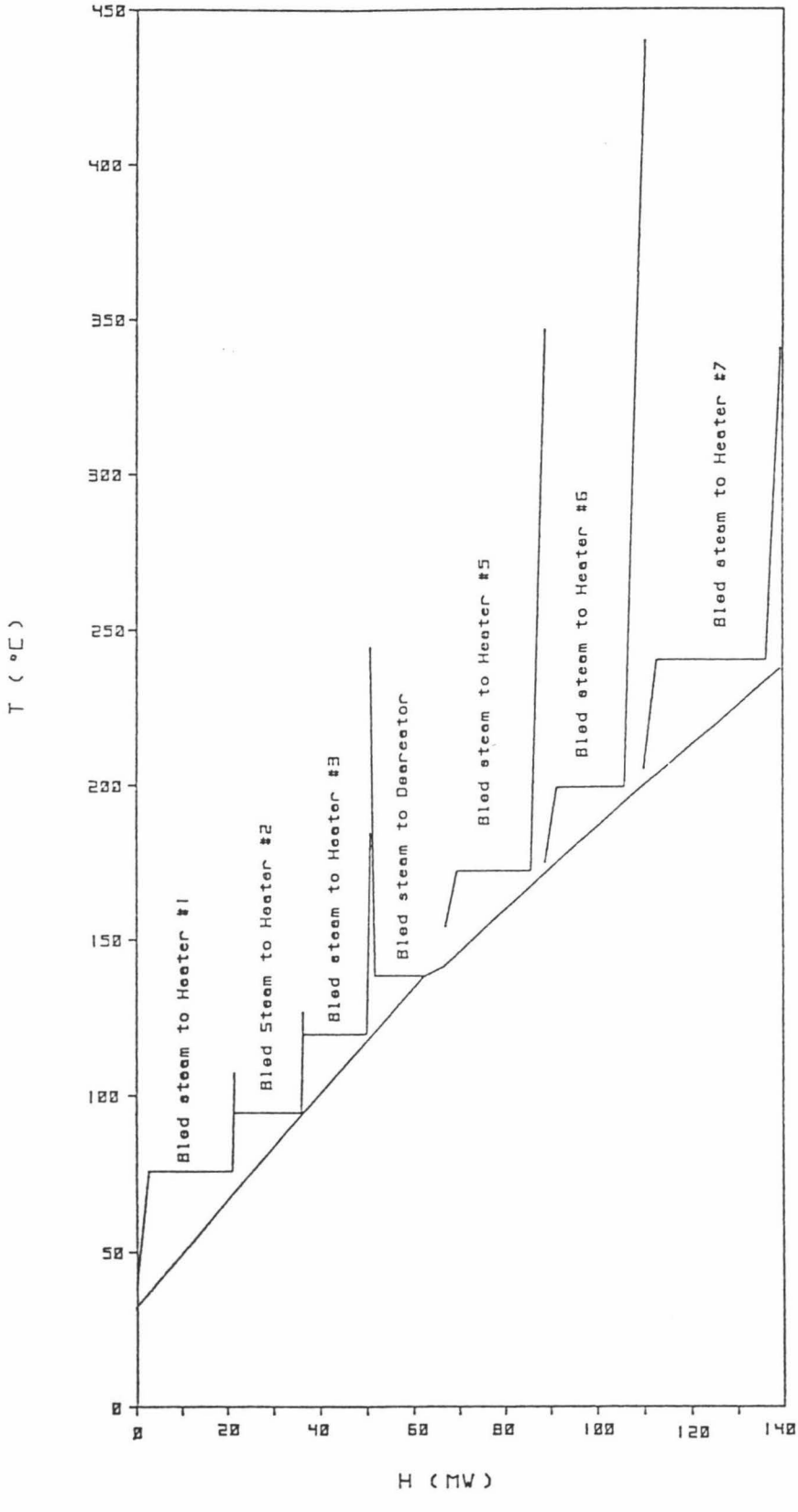


Figure 32 Feed Water Heating With Bled Steams (200 MW Power Output)

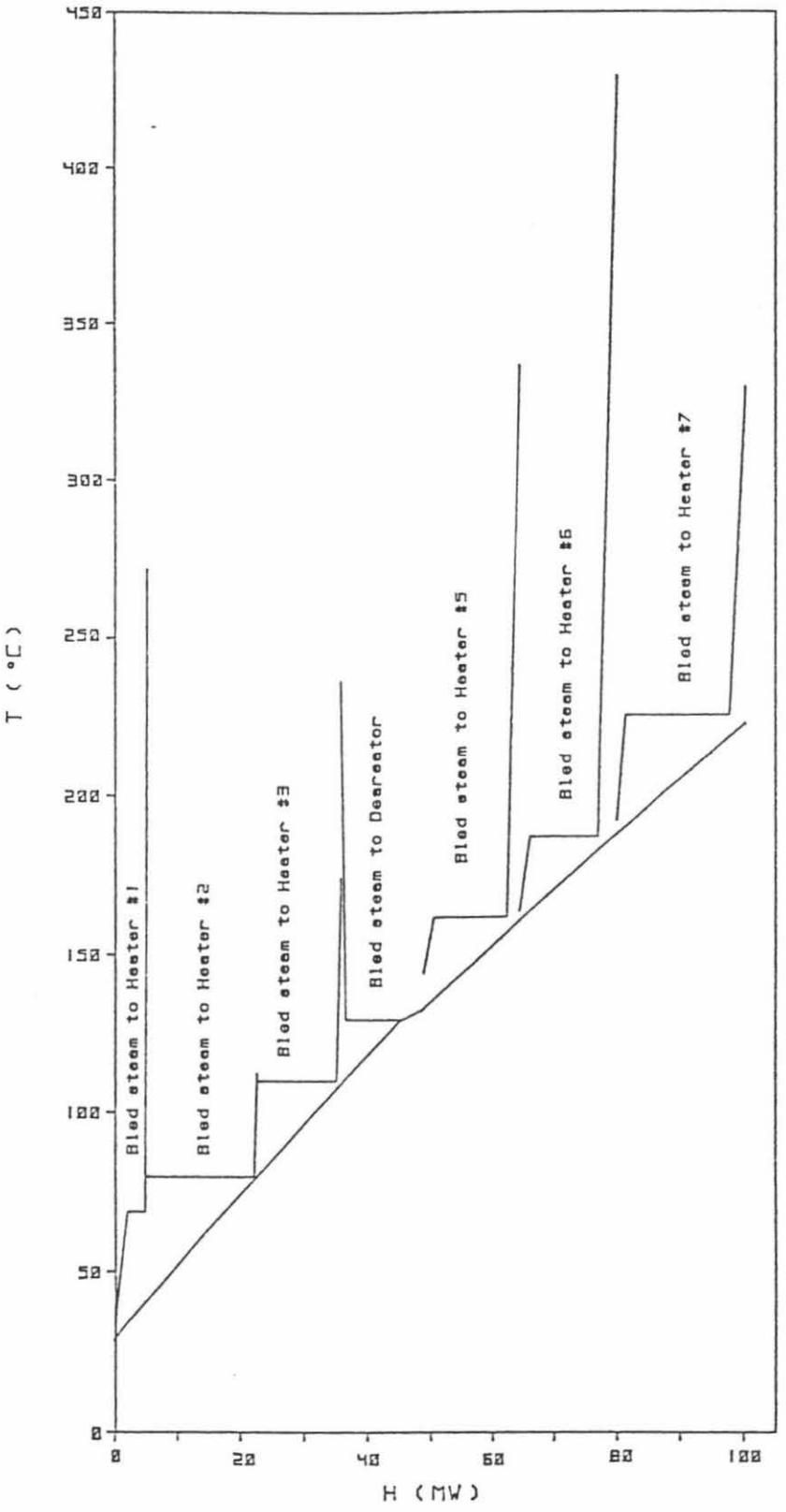


Figure 33 Feed Water Heating With Bled Steams (150 MW Power Output)

From the plots, we can observe that the bled steam to heater #6 has a much higher temperature than the bled steam to heater #7. However the actual heat content on that high temperature region is very small. The condensing temperature region of the bled steam to heater #6 which contribute most of the heat transfer to the feed water is both lower than the condensing temperature of the bled steam from the high pressure turbine and the temperature of the feed water that goes into heater #7. Therefore if we use the bled steam from the intermediate pressure turbine to heat up part of the feed water that is currently heated up by the bled steam from the high pressure turbine in heater #7, the result will be disastrous as we will actually cool the feed water down instead of heating it up.

8.2 INCREASING THE LEVEL OF UTILITIES

If we treated all the bled streams as utilities, by referring to Figure 31, 32 and 33, we can observe that there are 7 levels of utilities being used to heat up feed water starting from drain cooler outlet through to economizer inlet. These 7 levels of utilities corresponded to 7 unit of heaters. They are :

- 3 closed heater (low pressure)
- 1 open heater (deareator)
- 3 closed heater (high pressure).

A question can be raised on whether or not it is possible to increase the efficiency the plant by increasing the level of utility used in the plant (i.e. It means the increase of the number of heaters) and hence cost savings.

8.2.1 RESULTS AND DISCUSSION

If the number of heaters is increased without increasing the economiser inlet temperature, there will not be any improvement in the steam cycle efficiency. This can be explained more clearly by considering the Rankine cycle shown in Figure 34 representing the steam cycle of the plant.

The heat added to the cycle is

$$Q_{in} = F_1*(h_2-h_1) + F_a*(h_4-h_3)$$

The pump work is very small compared with the other energy transfers and hence it can be sensibly negleted (G.F.C. Rogers & Y.R. Mayhew, 1967, R. Joel, 1971, J.R. Dixon, 1975 and R.K. Will, 1979).

thus the work of the turbines is

$$W_{out} = F_1*(h_2-h_3) + F_a*(h_4-h_5) + F_b*(h_5-h_6) + F_c*(h_6-h_7) + F_d*(h_7-h_8) + F_e*(h_8-h_9) + F_f*(h_9-h_{10}) + F_g*(h_{10}-h_{11})$$

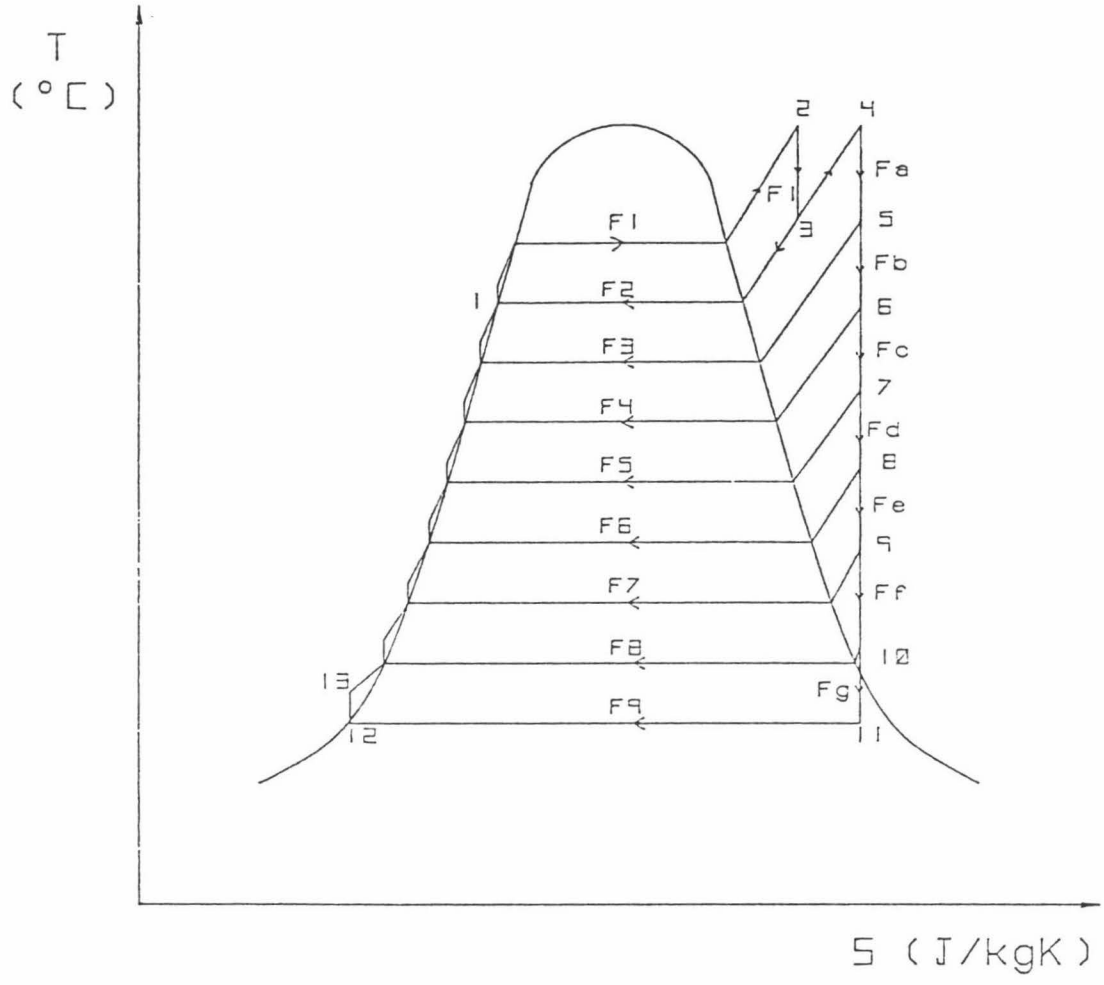


Figure 34 Rankine Cycle of the Plant

Point 1 : Economiser Inlet
2 : High Pressure Turbine Inlet
3 : High Pressure Turbine Outlet
4 : Intermediate Turbine Inlet
11 : Low Pressure Turbine Outlet
(Condenser Inlet)
12 : Condenser Outlet
13 : Pump Outlet

where

$$F_a = F_1 - F_2$$
$$F_b = F_1 - F_2 - F_3$$
$$F_c = F_1 - F_2 - F_3 - F_4$$
$$F_d = F_1 - F_2 - F_3 - F_4 - F_5$$
$$F_e = F_1 - F_2 - F_3 - F_4 - F_5 - F_6$$
$$F_f = F_1 - F_2 - F_3 - F_4 - F_5 - F_6 - F_7$$
$$F_g = F_1 - F_2 - F_3 - F_4 - F_5 - F_6 - F_7 - F_8$$

which assumes that the pump work has been negleted.

The cycle efficiency is

$$\eta = \frac{W_{out}}{Q_{in}} \times 100\%$$

Therefore if all the enthalpy and temperatures of the six points described in Figure 34 are the same, the steam cycle efficiency will remain the same. We can place as many heaters as possible in between point 2 & 3 and point 4 & 11 and still producing the same amount of power output as the heat requirement between point 1 & 12 is still the same.

The same weakness of implementing pinch method to the power station can also be identified with this approach. In theory

the level of utilities is applied to a fixed temperature interval. For power station cases, if the temperature interval where the utilities are applied (i.e. between drain cooler outlet and economiser inlet) are kept constant, no matter how many levels of utilities are used the steam cycle efficiency will still remain the same.

We can definitely increase the economiser inlet temperature. Figure 35 shows the rankine cycle of the plant with an extra regenerative cycle assuming that the extra heater is heated by the bled steam which bled from about the middle of the high pressure turbine. Table 8 shows the increase in efficiency, the reduction in the overall power outputs and the area requirement for three different loads (250 MW, 200 MW and 150 MW) resulting from an increase in economiser inlet temperature by the addition of one extra level of utility (i.e. an extra closed heater). The details of the calculations are shown in Appendix A7. The real gain in efficiency might be smaller than those shown in Table 8 as several simplifying assumptions (given in the appendix) have been made throughout the calculation.

The results have proven that it is possible to improve the steam cycle efficiency by increasing the number of heaters accompanied by an increase in the economiser inlet temperature. However the results have also showed it is not economical to do so. The reason is the increase in efficiency is not large enough to justify the following

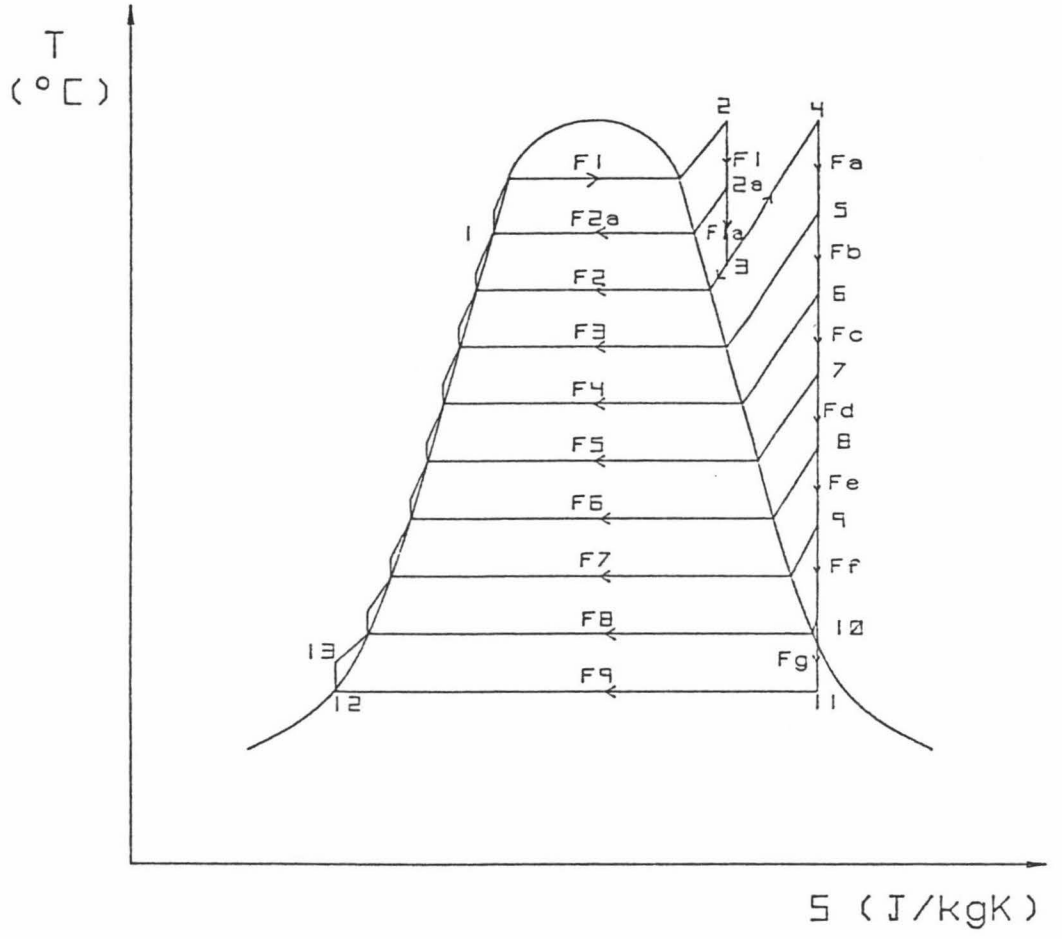


Figure 35 Rankine Cycle of the Plant with an extra regenerative cycle

Cycle 2a-1-2-2a is the extra regenerative cycle

consequences of adding the extra regenerative cycle:

1. Reasonably high reduction in power output (shown in Table 8)
2. Extra complexity in design and significant additional costs for plant retrofit.
3. The flue gas from the furnace is still very hot, therefore its heat must be transferred to some other part of the process. The area requirement for heat transfer and the cost of modification can be very large.

Table 8 The increased in efficiency as the results of an extra addition of regenerative cycle

Power loads (MW)	Increased in efficiency (%)	Reduction in power outputs (MW)	(%)	'UA' values (kW/°C)
250	0.26	26.3	10.5	410.63
200	0.33	15.4	8.4	220.28
150	0.35	12.2	9.3	168.11

Having more than one extra heater to increase the gain is generally possible. On the other hand, each extra heater 'costs' complexity in design. It is essential to balance the

gain in efficiency against the increase in capital cost brought about by increasing the number of heaters. Furthermore, as the number of heater increases, the extra gain due to the addition of a further heater falls drastically. Table 8 showed the extra gain in efficiency is already quite small thus any more extra heaters will become very uneconomical. Another important aspect is that when a large number of feed heaters is used, the feed water entering the boiler is nearly at boiling point and the economiser also becomes superfluous.

SECTION 9

CONCLUSION

Pinch Technology has a good reputation for industrial application. This covers a wide range of industries using both continuous and batch operations. Savings in energy and capital have been substantial. However its application to power station is not widely recognised yet. This thesis has applied the technique to the Huntly power station to investigate the potential for improvement in operating efficiency.

Initially, it was planned to use Hextran computer simulation package to perform all the process analysis. However it was found that the calculation results using Hextran were not sensitive enough. Therefore all the equations necessary to generate either grand composite curves or composites curves, used to undertake the pinch analysis, were set up on an IBM AT microcomputer using a Lotus Symphony 2.0 computer package.

This thesis shows that the pinch technology has been successfully applied to the Huntly power station . As the result, several areas for efficiency improvement have been indentified :

1. It has been found that the stream matches are not

'vertical' between the composite curves. The effect of such non 'vertical' matches is an increase in area and energy requirements. If these matches can be removed and hence curves can be shifted closer together to increase the heat exchange between the process , the plant efficiency can still be improved.

2. There are six streams (four from air ejectors, one from gland steam condenser and one from drain cooler drain) used cold utilities above the pinch shown in the grid representation. This means that the minimum energy target has not yet being achieved.

3. Exchange the bled steam to heater #7 with the bled steam to heater #6. The reason for changing the bled steam is the bled steam to heater #7 has a lower temperature than the bled to heater #6. However, the heater #7 inlet water has a higher temperature than heater #6 inlet water.

4. Increase the level of utilities (i.e. increase the number of heaters).

Unfortunately, the savings for the identified areas have proven insufficient justification for the extra complexity in the design and significant additional costs for plant retrofit.

The overall conclusion is that the plant is already operating at near optimum level for the type of equipment used.

It should be noted that pinch technology relies on the assumption that fixed values are given for flow rates and temperatures of the process streams that are to be integrated in the network. The problem is for the process with variable flow rates and temperatures, the location of the pinch points are varied according to the set of process conditions. The potential improvement in efficiency can be easily misjudged by someone who is not careful utilising the pinch technology in this situation. The resulting design will be infeasible.

The recommendation for further development is described in the following chapter.

SECTION 10

RECOMMENDATIONS FOR FURTHER DEVELOPMENT

The followings are the areas recommended for further development :

1. Apply the pinch method to many power outputs for many different weather conditions. Establish from the results whether the constraint on plant improvement occurs only when the plant is running at a certain extreme condition (such as low power output during a hot weather condition). If it is the case then an alternative solution to handle such a situation could be developed (for instance, running an extra heater or cooler during such a situation). With this practice, the plant retrofit using pinch technology could be carried out without having to worry about the constraint created by that conditions.

2. The current spreadsheet can only be used to produce a composite curve. It should be developed further so that it can be used not only for producing composite curve but also for automatic generation of the network configurations featuring minimum energy requirement and minimum number of units. Bearing in mind that the design decision should not be made by a computer on the basis of temperature and heat-load information only, it should also include the engineer's

knowledge on operation safety, flexibility, etc. Therefore development of an expert system based on designer expertise in conjunction with the spreadsheet for synthesis of heat exhanger networks is highly recommended.

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APPENDIX A1

DATA FROM THE PLANT RUNNING AT 250 MW

Drain Cooler (cold stream)	Supply (DC Inlet)	Target (DC outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	33.630	38.540	
P (bar)	11.567	10.133	674.326
h (kJ/kg)	141.870	162.240	
F (kg/s)	162.540	162.540	

Drain Cooler (hot stream)	Supply (H#1 drain)	Target (DC drain)	Heat capacity flowrate CP (kW/°C)
T (°C)	80.460	47.322	
P (bar)	0.486	0.486	99.952
h (kJ/kg)	336.850	198.090	
F (kg/s)	23.870	23.870	

Heater #1 (cold stream)	Supply (H#1 Inlet)	Target (H#1 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	38.540	77.783	
P (bar)	10.133	8.700	679.393
h (kJ/kg)	162.240	326.270	
F (kg/s)	162.540	162.540	

Heater #1 (hot streams)	Supply (H#1 shell)	Target (H#1 drain)	Heat capacity flowrate CP (kW/°C)
T (°C)	86.102	80.460	
P (bar)	0.486	0.486	4510.064
h (kJ/kg)	2655.520	336.850	
F (kg/s)	10.974	10.974	
	(H#2 drain)	(H#1 drain)	
T (°C)	102.850	80.460	
P (bar)	1.121	0.486	54.265
h (kJ/kg)	431.090	336.850	
F (kg/s)	12.893	12.893	

Heater #2 (cold stream)	Supply (H#2 Inlet)	Target (H#2 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	77.783	99.910	
P (bar)	8.700	7.267	682.276
h (kJ/kg)	326.270	419.150	
F (kg/s)	162.540	162.540	

Heater #2 (hot streams)	Supply (H#2 shell)	Target (H#2 drain)	Heat capacity flowrate CP (kW/°C)
T (°C)	122.909	102.850	
P (bar)	1.121	1.121	721.106
h (kJ/kg)	2721.070	431.090	
F (kg/s)	6.317	6.317	
	(H#3 drain)	(H#2 drain)	
T (°C)	125.540	102.850	
P (bar)	2.360	1.121	27.881
h (kJ/kg)	527.290	431.090	
F (kg/s)	6.576	6.576	

Heater #3 (cold stream)	Supply (H#3 Inlet)	Target (H#3 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	99.910	122.092	
P (bar)	7.267	5.833	686.742
h (kJ/kg)	419.150	512.870	
F (kg/s)	162.540	162.540	

Heater #3 (hot stream)	Supply (H#3 shell)	Target (H#3 drain)	Heat capacity flowrate CP (kW/°C)
T (°C)	187.743	125.540	
P (bar)	2.360	2.360	244.887
h (kJ/kg)	2843.660	527.290	
F (kg/s)	6.576	6.576	

Deaerator (mixing)	Supply (H#3 outlet)	Target	Heat capacity flowrate CP (kW/°C)
T (°C)	122.092		
P (bar)	5.833		694.219
h (kJ/kg)	512.870		
F (kg/s)	162.540		
	(bled steam)	(storage tank)	
T (°C)	249.977	148.130	
P (bar)	4.526	4.526	164.180
h (kJ/kg)	2962.650	624.080	
F (kg/s)	7.150	205.870	
	(H#5 drain)		
T (°C)	156.720		
P (bar)	10.600		157.691
h (kJ/kg)	661.520		
F (kg/s)	36.180		

Heater #5 (cold stream)	Supply (H#5 Inlet)	Target (H#5 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	151.160	181.950	
P (bar)	200.000	197.667	883.121
h (kJ/kg)	649.380	781.460	
F (kg/s)	205.870	205.870	

Heater #5 (hot streams)	Supply (H#5 shell)	Target (H#5 drain)	Heat capacity flowrate CP (kW/°C)
T (°C)	348.421	156.720	
P (bar)	10.600	10.600	122.970
h (kJ/kg)	3154.020	661.520	
F (kg/s)	9.458	9.458	
	(H#6 drain)	(H#5 drain)	
T (°C)	187.540	156.720	
P (bar)	18.500	10.600	117.353
h (kJ/kg)	796.870	661.520	
F (kg/s)	26.722	26.722	

Heater #6 (cold stream)	Supply (H#6 Inlet)	Target (H#6 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	181.950	208.430	
P (bar)	197.667	195.333	902.003
h (kJ/kg)	781.460	897.480	
F (kg/s)	205.870	205.870	

Heater #6 (hot streams)	Supply (H#6 shell)	Target (H#6 drain)	Heat capacity flowrate CP (kW/°C)
T (°C)	441.746	187.540	
P (bar)	18.500	18.500	85.445
h (kJ/kg)	3341.840	796.870	
F (kg/s)	8.535	8.535	
	(H#7 drain)	(H#6 drain)	
T (°C)	213.830	187.540	
P (bar)	39.800	18.500	82.330
h (kJ/kg)	915.880	796.870	
F (kg/s)	18.187	18.187	

Heater #7 (cold stream)	Supply (H#7 Inlet)	Target (H#7 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	208.430	250.040	
P (bar)	195.333	193.000	936.731
h (kJ/kg)	897.480	1086.810	
F (kg/s)	205.870	205.870	

Heater #7 (hot stream)	Supply (H#7 shell)	Target (H#7 drain)	Heat capacity flowrate CP (kW/°C)
T (°C)	335.602	213.830	
P (bar)	39.800	39.800	320.095
h (kJ/kg)	3059.070	915.880	
F (kg/s)	18.187	18.187	

Economiser (cold stream)	Supply (Inlet)	Target (outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	250.040	281.000	
P (bar)	186.000	186.000	997.366
h (kJ/kg)	1086.810	1236.800	
F (kg/s)	205.870	205.870	

Economiser (hot stream)	Supply (Flue gas)	Target (Flue gas)	Heat capacity flowrate CP (kW/°C)
T (°C)	450.000	338.000	
P (bar)	1.000	1.000	275.694
h (kJ/kg)	654.160	524.420	
F (kg/s)	237.997	237.997	

Primary Air (hot stream)	Supply (flue gas)	Target (flue gas)	Heat capacity flowrate CP (kW/°C)
T (°C)	450.000	160.000	
P (bar)	1.000	1.000	54.596
h (kJ/kg)	654.600	316.880	
F (kg/s)	46.881	46.881	

Primary Air (cold streams)	Supply (PA inlet)	Target (PA outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	21.000	343.000	
P (bar)	1.000	1.000	44.553
h (kJ/kg)	21.160	358.550	
F (kg/s)	42.521	42.521	
	(Air leak into flue gas)		
T (°C)	21.000	160.000	
P (bar)	1.000	1.000	10.544
h (kJ/kg)	21.160	316.880	
F (kg/s)	4.956	4.956	

Secondary Air (hot stream)	Supply (flue gas)	Target (flue gas)	Heat capacity flowrate CP (kW/°C)
T (°C)	338.000	120.000	
P (bar)	1.000	1.000	274.885
h (kJ/kg)	524.420	272.630	
F (kg/s)	237.996	237.996	

Secondary Air (cold streams)	Supply (SA inlet)	Target (SA outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	21.000	302.000	
P (bar)	1.000	1.000	98.498
h (kJ/kg)	21.160	314.530	
F (kg/s)	94.344	94.344	
T (°C)	21.000	267.178	
P (bar)	1.000	1.000	111.859
h (kJ/kg)	21.160	277.360	
F (kg/s)	107.483	107.483	
	(Air leak into flue gas)		
T (°C)	21.000	120.000	
P (bar)	1.000	1.000	23.180
h (kJ/kg)	21.160	273.730	
F (kg/s)	9.086	9.086	
T (°C)	21.000	121.000	
P (bar)	1.000	1.000	22.948
h (kJ/kg)	21.160	273.730	
F (kg/s)	9.086	9.086	

Primary SH (cold stream)	Supply (SH#3 Inlet)	Target (SH#3 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	356.497	445.000	
P (bar)	179.000	173.000	1353.090
h (kJ/kg)	2517.880	3099.570	
F (kg/s)	205.870	205.870	

Primary SH (hot stream)	Supply (Flue gas)	Target (Flue gas)	Heat capacity flowrate CP (kW/°C)
T (°C)	851.099	450.000	
P (bar)	1.000	1.000	298.565
h (kJ/kg)	1132.460	654.160	
F (kg/s)	250.375	250.375	

Reheaters (cold stream)	Supply (H.P.T.Exh.)	Target (I.P.T.inlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	336.310	538.020	
P (bar)	40.500	37.500	430.930
h (kJ/kg)	3059.070	3533.820	
F (kg/s)	183.092	183.092	

Reheaters (hot stream)	Supply (Flue gas)	Target (Flue gas)	Heat capacity flowrate CP (kW/°C)
T (°C)	1125.654	851.099	
P (bar)	1.000	1.000	316.594
h (kJ/kg)	1479.630	1132.460	
F (kg/s)	250.375	250.375	

Secondary SH (cold stream)	Supply (SH#3 out)	Target (SH#5 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	445.000	540.390	
P (bar)	173.000	169.000	651.278
h (kJ/kg)	3099.570	3401.340	
F (kg/s)	205.870	205.870	

Secondary SH (hot stream)	Supply (Flue gas)	Target (Flue gas)	Heat capacity flowrate CP (kW/°C)
T (°C)	1315.670	1125.654	
P (bar)	1.000	1.000	326.935
h (kJ/kg)	1727.750	1479.630	
F (kg/s)	250.375	250.375	

Furnace Wall (cold stream)	Supply (Econ. out)	Target (SH#3 inlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	281.000	356.497	
P (bar)	186.000	179.000	3493.330
h (kJ/kg)	1236.800	2517.880	
F (kg/s)	205.870	205.870	

Comb. Chamber (hot stream)	Supply (Flue gas)	Target (Flue gas)	Heat capacity flowrate CP (kW/°C)
T (°C)	1895.040	1315.670	
P (bar)	1.000	1.000	343.883
h (kJ/kg)	2523.500	1727.750	
F (kg/s)	250.375	250.375	
	(Flue gas to water-wall)		
	(Chamber)	(Econ. inlet)	
T (°C)	1895.040	450.000	
P (bar)	1.000	1.000	44.635
h (kJ/kg)	2523.500	654.160	
F (kg/s)	34.504	34.504	

Main condenser (cold stream)	Supply (C.W. Inlet)	Target (C.W. outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	16.000	24.000	
P (bar)	3.000	3.000	36384.478
h (kJ/kg)	67.410	100.860	
F (kg/s)	8701.818	8701.818	

Main condenser (hot streams)	Supply (Cond.shell)	Target (Cond. out)	Heat capacity flowrate CP (kW/°C)
T (°C)	31.800	31.800	
P (bar)	0.047	0.047	∞
h (kJ/kg)	2338.580	133.120	
F (kg/s)	131.195	131.195	
	(Drain cooler drain)		
T (°C)	47.322	31.800	
P (bar)	0.486	0.047	99.899
h (kJ/kg)	198.090	133.120	
F (kg/s)	23.867	23.867	
	(Gland steam condenser drain)		
T (°C)	99.068	31.800	
P (bar)	0.980	0.047	0.914
h (kJ/kg)	415.130	133.120	
F (kg/s)	0.218	0.218	
	(Air Ejector Stage#1 drain)		
T (°C)	56.240	31.800	
P (bar)	0.167	0.047	0.268
h (kJ/kg)	235.350	133.120	
F (kg/s)	0.064	0.064	
	(Air Ejector Stage#2 drain)		
T (°C)	79.654	31.800	
P (bar)	0.467	0.047	0.260
h (kJ/kg)	333.460	133.120	
F (kg/s)	0.062	0.062	
	(Air Ejector Stage#3 drain)		
T (°C)	99.632	31.800	
P (bar)	1.000	0.047	0.245
h (kJ/kg)	417.510	133.120	
F (kg/s)	0.058	0.058	
	(BFPT Condensate:Air Ejector outlet)		
T (°C)	37.168	31.800	
P (bar)	1.000	0.047	29.950
h (kJ/kg)	155.700	133.120	
F (kg/s)	7.120	7.120	

BFPT condenser (cold stream)	Supply (C.W. Inlet)	Target (C.W. outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	16.000	24.000	
P (bar)	3.000	3.000	1994.749
h (kJ/kg)	67.410	100.860	
F (kg/s)	477.070	477.070	

BFPT condenser (hot streams)	Supply (Cond.shell)	Target (Cond. out)	Heat capacity flowrate CP (kW/°C)
T (°C)	31.800	31.800	
P (bar)	0.047	0.047	∞
h (kJ/kg)	2415.750	133.120	
F (kg/s)	7.109	7.109	
	(Air Ejector Stage#1 drain)		
T (°C)	59.760	31.800	
P (bar)	0.197	0.047	0.106
h (kJ/kg)	250.090	133.120	
F (kg/s)	0.025	0.025	
	(Air Ejector Stage#2 drain)		
T (°C)	99.632	31.800	
P (bar)	1.000	0.047	0.106
h (kJ/kg)	417.510	133.120	
F (kg/s)	0.025	0.025	

APPENDIX A2

DATA FROM THE PLANT RUNNING AT 200 MW
(Primary Air Heater out of service)

Drain Cooler (cold stream)	Supply (DC Inlet)	Target (DC outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	31.990	36.610	
P (bar)	14.732	12.474	577.221
h (kJ/kg)	135.310	154.390	
F (kg/s)	139.767	139.767	

Drain Cooler (hot stream)	Supply (H#1 drain)	Target (DC drain)	Heat capacity flowrate CP (kW/°C)
T (°C)	72.550	39.964	
P (bar)	0.348	0.348	81.857
h (kJ/kg)	303.660	167.330	
F (kg/s)	19.566	19.566	

Heater #1 (cold stream)	Supply (H#1 Inlet)	Target (H#1 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	36.610	68.840	
P (bar)	12.474	10.215	583.397
h (kJ/kg)	154.390	288.920	
F (kg/s)	139.767	139.767	

Heater #1 (hot streams)	Supply (H#1 shell)	Target (H#1 drain)	Heat capacity flowrate CP (kW/°C)
T (°C)	107.202	72.550	
P (bar)	0.348	0.348	512.095
h (kJ/kg)	2698.380	303.660	
F (kg/s)	7.410	7.410	
	(H#2 drain)	(H#1 drain)	
T (°C)	93.260	72.550	
P (bar)	0.793	0.348	51.064
h (kJ/kg)	390.660	303.660	
F (kg/s)	12.156	12.156	

Heater #2 (cold stream)	Supply (H#2 Inlet)	Target (H#2 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	68.840	93.990	
P (bar)	10.215	7.957	585.522
h (kJ/kg)	288.920	394.280	
F (kg/s)	139.767	139.767	

Heater #2 (hot streams)	Supply (H#2 shell)	Target (H#2 drain)	Heat capacity flowrate CP (kW/°C)
T (°C)	126.787	93.260	
P (bar)	0.793	0.793	420.517
h (kJ/kg)	2732.090	390.660	
F (kg/s)	6.021	6.021	
	(H#3 drain)	(H#2 drain)	
T (°C)	117.429	93.260	
P (bar)	1.829	0.793	25.923
h (kJ/kg)	492.800	390.660	
F (kg/s)	6.134	6.134	

Heater #3 (cold stream)	Supply (H#3 Inlet)	Target (H#3 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	93.990	118.420	
P (bar)	7.957	5.699	589.277
h (kJ/kg)	394.280	497.280	
F (kg/s)	139.767	139.767	

Heater #3 (hot stream)	Supply (H#3 shell)	Target (H#3 drain)	Heat capacity flowrate CP (kW/°C)
T (°C)	184.303	117.429	
P (bar)	1.829	1.829	215.268
h (kJ/kg)	2839.650	492.800	
F (kg/s)	6.134	6.134	

Deaerator (mixing)	Supply (H#3 outlet)	Target	Heat capacity flowrate CP (kW/°C)
T (°C)	118.420		
P (bar)	5.699		594.311
h (kJ/kg)	497.280		
F (kg/s)	139.767		
	(D A Shell)	(storage tank)	
T (°C)	244.168	138.250	
P (bar)	3.441	3.441	92.735
h (kJ/kg)	2954.480	581.600	
F (kg/s)	4.139	172.615	
	(H#5 drain)		
T (°C)	154.080		
P (bar)	8.322		123.990
h (kJ/kg)	649.970		
F (kg/s)	28.708		

Heater #5 (cold stream)	Supply (H#5 Inlet)	Target (H#5 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	141.647	171.150	
P (bar)	189.274	188.246	736.902
h (kJ/kg)	608.290	734.240	
F (kg/s)	172.615	172.615	

Heater #5 (hot streams)	Supply (H#5 shell)	Target (H#5 drain)	Heat capacity flowrate CP (kW/°C)
T (°C)	346.591	154.080	
P (bar)	8.322	8.322	103.188
h (kJ/kg)	3154.620	649.970	
F (kg/s)	7.931	7.931	
	(H#6 drain)	(H#5 drain)	
T (°C)	174.740	154.080	
P (bar)	15.260	8.322	90.800
h (kJ/kg)	740.260	649.970	
F (kg/s)	20.777	20.777	

Heater #6 (cold stream)	Supply (H#6 Inlet)	Target (H#6 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	171.150	199.550	
P (bar)	188.246	187.217	751.299
h (kJ/kg)	734.240	857.850	
F (kg/s)	172.615	172.615	

Heater #6 (hot streams)	Supply (H#6 shell)	Target (H#6 drain)	Heat capacity flowrate CP (kW/°C)
T (°C)	439.781	174.740	
P (bar)	15.260	15.260	73.747
h (kJ/kg)	3341.940	740.260	
F (kg/s)	7.513	7.513	
	(H#7 drain)	(H#6 drain)	
T (°C)	204.930	174.740	
P (bar)	33.530	15.260	59.325
h (kJ/kg)	875.290	740.260	
F (kg/s)	13.264	13.264	

Heater #7 (cold stream)	Supply (H#7 Inlet)	Target (H#7 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	199.550	237.370	
P (bar)	187.217	186.189	775.853
h (kJ/kg)	857.850	1027.840	
F (kg/s)	172.615	172.615	

Heater #7 (hot stream)	Supply (H#7 shell)	Target (H#7 drain)	Heat capacity flowrate CP (kW/°C)
T (°C)	340.795	204.930	
P (bar)	33.530	33.530	215.969
h (kJ/kg)	3087.490	875.290	
F (kg/s)	13.264	13.264	

Economiser (cold stream)	Supply (Inlet)	Target (outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	237.370	264.523	
P (bar)	178.173	178.173	812.884
h (kJ/kg)	1027.840	1155.710	
F (kg/s)	172.615	172.615	

Economiser (hot stream)	Supply (Flue gas)	Target (Flue gas)	Heat capacity flowrate CP (kW/°C)
T (°C)	393.069	308.453	
P (bar)	1.018	1.021	268.665
h (kJ/kg)	693.750	593.530	
F (kg/s)	226.835	226.835	

Furnace Wall (cold stream)	Supply (Econ. out)	Target (SH#3 inlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	264.523	354.757	
P (bar)	178.173	175.252	2616.278
h (kJ/kg)	1155.710	2523.370	
F (kg/s)	172.614	172.614	

Comb. Chamber (hot stream)	Supply (Flue gas)	Target (Flue gas)	Heat capacity flowrate CP (kW/°C)
T (°C)	1922.813	1240.043	
P (bar)	1.018	1.018	298.387
h (kJ/kg)	2735.470	1767.880	
F (kg/s)	210.554	210.554	
	(Flue gas to water-wall)		
	(Chamber)	(Econ. inlet)	
T (°C)	1922.813	393.069	
P (bar)	1.018	1.018	21.730
h (kJ/kg)	2735.470	693.750	
F (kg/s)	16.281	16.281	

Secondary Air (hot stream)	Supply (flue gas)	Target (flue gas)	Heat capacity flowrate CP (kW/°C)
T (°C)	308.453	106.001	
P (bar)	1.021	1.016	133.382
h (kJ/kg)	593.530	355.440	
F (kg/s)	113.417	113.417	
T (°C)	308.453	111.061	
P (bar)	1.021	1.016	133.538
h (kJ/kg)	593.530	355.440	
F (kg/s)	113.417	113.417	

Secondary Air (cold streams)	Supply (SA inlet)	Target (SA outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	20.143	260.749	
P (bar)	1.048	1.043	108.064
h (kJ/kg)	20.290	270.520	
F (kg/s)	103.907	103.907	
T (°C)	20.143	241.529	
P (bar)	1.048	1.041	114.454
h (kJ/kg)	20.290	250.110	
F (kg/s)	110.254	110.254	
	(Air leak into flue gas)		
T (°C)	20.143	106.001	
P (bar)	1.048	1.043	11.686
h (kJ/kg)	20.290	355.440	
F (kg/s)	2.994	2.994	
T (°C)	20.143	111.061	
P (bar)	1.048	1.043	11.223
h (kJ/kg)	20.290	361.120	
F (kg/s)	2.994	2.994	

Primary SH (cold stream)	Supply (SH#3 Inlet)	Target (SH#3 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	354.757	439.000	
P (bar)	175.252	170.676	1127.037
h (kJ/kg)	2532.370	3082.420	
F (kg/s)	172.611	172.611	

Primary SH (hot stream)	Supply (Flue gas)	Target (Flue gas)	Heat capacity flowrate CP (kW/°C)
T (°C)	763.822	393.069	
P (bar)	1.018	1.018	256.087
h (kJ/kg)	1144.680	693.750	
F (kg/s)	210.554	210.554	

Reheaters (cold stream)	Supply (H.P.T.Exh.)	Target (RH#2 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	340.380	545.727	
P (bar)	33.890	32.550	352.439
h (kJ/kg)	3085.630	3556.070	
F (kg/s)	153.839	153.839	

Reheaters (hot stream)	Supply (Flue gas)	Target (Flue gas)	Heat capacity flowrate CP (kW/°C)
T (°C)	1030.508	763.822	
P (bar)	1.018	1.018	271.382
h (kJ/kg)	1488.410	1144.680	
F (kg/s)	210.554	210.554	

Secondary SH (cold stream)	Supply (SH#3 out)	Target (SH#5 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	439.000	548.580	
P (bar)	170.676	167.626	536.605
h (kJ/kg)	3082.420	3425.360	
F (kg/s)	171.462	171.462	

Secondary SH (hot stream)	Supply (Flue gas)	Target (Flue gas)	Heat capacity flowrate CP (kW/°C)
T (°C)	1240.043	1030.508	
P (bar)	1.018	1.018	280.829
h (kJ/kg)	1767.880	1488.410	
F (kg/s)	210.554	210.554	

BFPT condenser (cold stream)	Supply (C.W. Inlet)	Target (C.W. outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	9.243	12.877	
P (bar)	2.000	2.000	3755.011
h (kJ/kg)	39.010	54.240	
F (kg/s)	895.976	895.976	

BFPT condenser (hot streams)	Supply (Cond.shell)	Target (Cond. out)	Heat capacity flowrate CP (kW/°C)
T (°C)	20.635	20.635	
P (bar)	0.024	0.024	∞
h (kJ/kg)	2421.710	85.474	
F (kg/s)	6.070	6.070	
	(Air Ejector Stage#1 drain)		
T (°C)	59.038	20.635	
P (bar)	0.191	0.024	0.106
h (kJ/kg)	247.070	85.474	
F (kg/s)	0.025	0.025	
	(Air Ejector Stage#2 drain)		
T (°C)	99.632	20.635	
P (bar)	1.000	0.024	0.106
h (kJ/kg)	417.510	85.474	
F (kg/s)	0.025	0.025	

Main condenser (cold stream)	Supply (C.W. Inlet)	Target (C.W. outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	9.243	18.594	
P (bar)	2.000	2.000	27625.721
h (kJ/kg)	39.010	78.170	
F (kg/s)	6596.734	6596.734	

Main condenser (hot streams)	Supply (Cond.shell)	Target (Cond. out)	Heat capacity flowrate CP (kW/°C)
T (°C)	29.198	29.198	
P (bar)	0.041	0.041	∞
h (kJ/kg)	2411.390	123.120	
F (kg/s)	112.536	112.536	
	(Drain cooler drain)		
T (°C)	39.964	29.198	
P (bar)	0.348	0.041	80.345
h (kJ/kg)	167.330	123.120	
F (kg/s)	19.566	19.566	
	(Gland steam condenser drain)		
T (°C)	99.068	29.198	
P (bar)	0.980	0.041	0.911
h (kJ/kg)	415.130	123.120	
F (kg/s)	0.218	0.218	
	(Air Ejector Stage#1 drain)		
T (°C)	55.406	29.198	
P (bar)	0.160	0.041	0.357
h (kJ/kg)	231.870	123.120	
F (kg/s)	0.086	0.086	
	(Air Ejector Stage#2 drain)		
T (°C)	79.309	29.198	
P (bar)	0.461	0.041	0.348
h (kJ/kg)	332.020	123.120	
F (kg/s)	0.084	0.084	
	(Air Ejector Stage#3 drain)		
T (°C)	99.632	29.198	
P (bar)	1.000	0.041	0.326
h (kJ/kg)	417.510	123.120	
F (kg/s)	0.078	0.078	
	(BFPT Condensate:Air Ejector outlet)		
T (°C)	30.066	29.198	
P (bar)	1.875	0.041	20.949
h (kJ/kg)	126.110	123.120	
F (kg/s)	6.081	6.081	

APPENDIX A3

DATA FROM THE PLANT RUNNING AT 150 MW
(Primary Air Heater out of service)

Drain Cooler (cold stream)	Supply (DC Inlet)	Target (DC outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	28.810	33.950	
P (bar)	15.029	12.548	359.175
h (kJ/kg)	126.240	143.290	
F (kg/s)	108.279	108.279	

Drain Cooler (hot stream)	Supply (H#1 drain)	Target (DC drain)	Heat capacity flowrate CP (kW/°C)
T (°C)	68.661	36.223	
P (bar)	0.302	0.302	60.696
h (kJ/kg)	287.360	151.690	
F (kg/s)	14.512	14.512	

Heater #1 (cold stream)	Supply (H#1 Inlet)	Target (H#1 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	33.950	40.950	
P (bar)	12.548	10.066	448.740
h (kJ/kg)	143.290	172.300	
F (kg/s)	108.279	108.279	

Heater #1 (hot streams)	Supply (H#1 shell)	Target (H#1 drain)	Heat capacity flowrate CP (kW/°C)
T (°C)	271.697	68.661	
P (bar)	0.302	0.302	12.863
h (kJ/kg)	3019.730	287.360	
F (kg/s)	0.956	0.956	
	(H#2 drain)	(H#1 drain)	
T (°C)	78.634	68.661	
P (bar)	0.448	0.302	53.085
h (kJ/kg)	329.180	287.360	
F (kg/s)	12.659	12.659	

Heater #2 (cold stream)	Supply (H#2 Inlet)	Target (H#2 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	40.950	79.550	
P (bar)	10.066	7.585	452.445
h (kJ/kg)	172.300	333.590	
F (kg/s)	108.279	108.279	

Heater #2 (hot streams)	Supply (H#2 shell)	Target (H#2 drain)	Heat capacity flowrate CP (kW/°C)
T (°C)	112.334	78.634	
P (bar)	0.448	0.448	497.897
h (kJ/kg)	2707.240	329.180	
F (kg/s)	7.056	7.056	
	(H#3 drain)	(H#2 drain)	
T (°C)	107.669	78.634	
P (bar)	1.324	0.448	23.597
h (kJ/kg)	451.450	329.180	
F (kg/s)	5.604	5.604	

Heater #3 (cold stream)	Supply (H#3 Inlet)	Target (H#3 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	79.550	108.740	
P (bar)	7.585	5.104	455.040
h (kJ/kg)	333.590	456.260	
F (kg/s)	108.279	108.279	

Heater #3 (hot stream)	Supply (H#3 shell)	Target (H#3 drain)	Heat capacity flowrate CP (kW/°C)
T (°C)	173.890	107.669	
P (bar)	1.324	1.324	200.571
h (kJ/kg)	2821.710	451.450	
F (kg/s)	5.604	5.604	

Deaerator (mixing)	Supply (H#3 outlet)	Target	Heat capacity flowrate CP (kW/°C)
T (°C)	108.740		
P (bar)	5.104		458.476
h (kJ/kg)	456.260		
F (kg/s)	108.279		
	(D A Shell)	(storage tank)	
T (°C)	236.134	129.150	
P (bar)	2.633	2.633	75.394
h (kJ/kg)	2940.970	542.680	
F (kg/s)	3.363	131.832	
	(H#5 drain)		
T (°C)	144.050		
P (bar)	6.444		86.692
h (kJ/kg)	606.660		
F (kg/s)	20.189		

Heater #5 (cold stream)	Supply (H#5 Inlet)	Target (H#5 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	132.614	160.390	
P (bar)	182.963	182.422	560.153
h (kJ/kg)	569.660	687.680	
F (kg/s)	131.832	131.832	

Heater #5 (hot streams)	Supply (H#5 shell)	Target (H#5 drain)	Heat capacity flowrate CP (kW/°C)
T (°C)	336.437	144.050	
P (bar)	6.444	6.444	74.572
h (kJ/kg)	3137.120	606.660	
F (kg/s)	5.670	5.670	
	(H#6 drain)	(H#5 drain)	
T (°C)	163.310	144.050	
P (bar)	11.740	6.444	62.957
h (kJ/kg)	690.170	606.660	
F (kg/s)	14.520	14.520	

Heater #6 (cold stream)	Supply (H#6 Inlet)	Target (H#6 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	160.390	187.750	
P (bar)	182.422	181.881	569.441
h (kJ/kg)	687.680	805.860	
F (kg/s)	131.832	131.832	

Heater #6 (hot streams)	Supply (H#6 shell)	Target (H#6 drain)	Heat capacity flowrate CP (kW/°C)
T (°C)	429.485	163.310	
P (bar)	11.740	11.740	54.210
h (kJ/kg)	3324.630	690.170	
F (kg/s)	5.477	5.477	
	(H#7 drain)	(H#6 drain)	
T (°C)	192.080	163.310	
P (bar)	25.730	11.740	39.980
h (kJ/kg)	817.370	690.170	
F (kg/s)	9.043	9.043	

Heater #7 (cold stream)	Supply (H#7 Inlet)	Target (H#7 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	187.750	222.740	
P (bar)	181.881	181.340	584.559
h (kJ/kg)	805.860	961.010	
F (kg/s)	131.832	131.832	

Heater #7 (hot stream)	Supply (H#7 shell)	Target (H#7 drain)	Heat capacity flowrate CP (kW/°C)
T (°C)	329.548	192.080	
P (bar)	25.730	25.730	148.786
h (kJ/kg)	3079.260	817.370	
F (kg/s)	9.043	9.043	

Economiser (cold stream)	Supply (Inlet)	Target (outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	222.798	253.680	
P (bar)	173.482	173.482	609.469
h (kJ/kg)	961.010	1103.780	
F (kg/s)	131.832	131.832	

Economiser (hot stream)	Supply (Flue gas)	Target (Flue gas)	Heat capacity flowrate CP (kW/°C)
T (°C)	383.947	290.412	
P (bar)	1.013	1.013	206.558
h (kJ/kg)	674.030	563.850	
F (kg/s)	175.353	175.353	

Furnace Wall (cold stream)	Supply (Econ. out)	Target (SH#3 inlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	253.680	352.674	
P (bar)	173.482	170.856	1924.011
h (kJ/kg)	1103.780	2548.540	
F (kg/s)	131.832	131.832	

Comb. Chamber (hot stream)	Supply (Flue gas)	Target (Flue gas)	Heat capacity flowrate CP (kW/°C)
T (°C)	1915.359	1116.284	
P (bar)	1.013	1.013	244.677
h (kJ/kg)	2700.290	1585.310	
F (kg/s)	175.353	175.353	
	(Flue gas to water-wall)		
	(Chamber)	(Econ. inlet)	
T (°C)	1915.359	383.947	
P (bar)	1.013	1.013	8.054
h (kJ/kg)	2700.290	674.030	
F (kg/s)	6.087	6.087	

Secondary Air (hot stream)	Supply (flue gas)	Target (flue gas)	Heat capacity flowrate CP (kW/°C)
T (°C)	290.412	101.936	
P (bar)	1.013	1.012	104.742
h (kJ/kg)	563.850	338.690	
F (kg/s)	87.677	87.677	
T (°C)	290.412	105.988	
P (bar)	1.013	1.012	104.880
h (kJ/kg)	563.850	343.240	
F (kg/s)	87.677	87.677	

Secondary Air (cold streams)	Supply (SA inlet)	Target (SA outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	25.149	248.574	
P (bar)	1.037	1.033	81.956
h (kJ/kg)	25.350	257.580	
F (kg/s)	78.848	78.848	
T (°C)	25.149	223.443	
P (bar)	1.037	1.033	90.227
h (kJ/kg)	25.350	230.960	
F (kg/s)	87.017	87.017	
	(Air leak into flue gas)		
T (°C)	25.149	101.936	
P (bar)	1.037	1.012	18.628
h (kJ/kg)	25.350	338.690	
F (kg/s)	4.565	4.565	
T (°C)	25.149	105.988	
P (bar)	1.037	1.012	17.951
h (kJ/kg)	25.350	343.240	
F (kg/s)	4.565	4.565	

Primary SH (cold stream)	Supply (SH#3 Inlet)	Target (SH#3 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	352.674	430.000	
P (bar)	170.856	168.228	861.717
h (kJ/kg)	2548.540	3053.980	
F (kg/s)	131.832	131.832	

Primary SH (hot stream)	Supply (Flue gas)	Target (Flue gas)	Heat capacity flowrate CP (kW/°C)
T (°C)	691.963	383.947	
P (bar)	1.013	1.013	216.326
h (kJ/kg)	1041.270	674.030	
F (kg/s)	181.441	181.441	

Reheaters (cold stream)	Supply (H.P.T.Exh.)	Target (RH#2 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	327.350	527.000	
P (bar)	25.759	24.931	265.332
h (kJ/kg)	3074.020	3521.720	
F (kg/s)	118.324	118.324	

Reheaters (hot stream)	Supply (Flue gas)	Target (Flue gas)	Heat capacity flowrate CP (kW/°C)
T (°C)	922.907	691.963	
P (bar)	1.013	1.013	229.378
h (kJ/kg)	1333.230	1041.270	
F (kg/s)	181.441	181.441	

Secondary SH (cold stream)	Supply (SH#3 out)	Target (SH#5 outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	430.000	540.000	
P (bar)	168.228	167.626	415.683
h (kJ/kg)	3053.980	3403.000	
F (kg/s)	131.010	131.010	

Secondary SH (hot stream)	Supply (Flue gas)	Target (Flue gas)	Heat capacity flowrate CP (kW/°C)
T (°C)	1116.284	922.907	
P (bar)	1.013	1.013	236.520
h (kJ/kg)	1585.310	1333.230	
F (kg/s)	181.441	181.441	

BFPT condenser (cold stream)	Supply (C.W. Inlet)	Target (C.W. outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	9.545	12.840	
P (bar)	2.000	2.000	3280.290
h (kJ/kg)	40.280	54.090	
F (kg/s)	782.661	782.661	

BFPT condenser (hot streams)	Supply (Cond.shell)	Target (Cond. out)	Heat capacity flowrate CP (kW/°C)
T (°C)	20.230	20.230	
P (bar)	0.024	0.024	∞
h (kJ/kg)	2431.580	85.474	
F (kg/s)	4.819	4.819	
	(Air Ejector Stage#1 drain)		
T (°C)	58.272	20.230	
P (bar)	0.184	0.024	0.105
h (kJ/kg)	243.860	85.474	
F (kg/s)	0.025	0.025	
	(Air Ejector Stage#2 drain)		
T (°C)	99.632	20.230	
P (bar)	1.000	0.024	0.106
h (kJ/kg)	417.510	85.474	
F (kg/s)	0.025	0.025	

Main condenser (cold stream)	Supply (C.W. Inlet)	Target (C.W. outlet)	Heat capacity flowrate CP (kW/°C)
T (°C)	9.545	16.772	
P (bar)	2.000	2.000	28554.499
h (kJ/kg)	40.280	70.550	
F (kg/s)	6817.422	6817.422	

Main condenser (hot streams)	Supply (Cond.shell)	Target (Cond. out)	Heat capacity flowrate CP (kW/°C)
T (°C)	26.102	26.102	
P (bar)	0.034	0.034	∞
h (kJ/kg)	2431.750	109.720	
F (kg/s)	88.527	88.527	
	(Drain cooler drain)		
T (°C)	36.223	26.102	
P (bar)	0.302	0.034	60.178
h (kJ/kg)	151.690	109.720	
F (kg/s)	14.512	14.512	
	(Gland steam condenser drain)		
T (°C)	99.068	26.102	
P (bar)	0.980	0.034	0.912
h (kJ/kg)	415.130	109.720	
F (kg/s)	0.218	0.218	
	(Air Ejector Stage#1 drain)		
T (°C)	54.517	26.102	
P (bar)	0.154	0.034	0.433
h (kJ/kg)	228.150	109.720	
F (kg/s)	0.104	0.104	
	(Air Ejector Stage#2 drain)		
T (°C)	78.949	26.102	
P (bar)	0.454	0.034	0.420
h (kJ/kg)	330.510	109.720	
F (kg/s)	0.101	0.101	
	(Air Ejector Stage#3 drain)		
T (°C)	99.632	26.102	
P (bar)	1.000	0.034	0.393
h (kJ/kg)	417.510	109.720	
F (kg/s)	0.094	0.094	
	(BFPT Condensate:Air Ejector outlet)		
T (°C)	30.753	26.102	
P (bar)	1.971	0.034	20.001
h (kJ/kg)	128.980	109.720	
F (kg/s)	4.830	4.830	

APPENDIX A4

THE SPREADSHEET DISKETTE AND FORMULAE LISTING

1.0 DISKETTE CONTAINING THE SPREADSHEET

2.0 THE FORMULA LISTING

a) The following formulas are used for setting up the interval temperature.

```
C1: ' SETTING UP THE INTERVAL TEMPERATURES
D2: "dTmin =
E2: 10.8
F2: (F2) '(deg C)
A3: \-
B3: \-
C3: \-
D3: \-
E3: \-
F3: \-
G3: \-
H3: \-
A4: ''1' Hot
B4: ' STREAMS
C4: ^       ACTUAL
E4: ^     INTERVAL
G4: (F2) ^    RANKED
H4: ^CP
A5: ^or
C5: ^    TEMPERATURES
E5: ^   TEMPERATURES
G5: (F2) ^   ORDER
A6: ''0' Cold
C6: ^SOURCE
D6: ^TARGET
E6: ^SOURCE
F6: (F2) ^TARGET
C7: ^(deg C)
D7: ^(deg C)
E7: ^(deg C)
F7: (F2) ^(deg C)
G7: (F2) ^   (deg C)
H7: "(MW/deg C)
A8: \-
B8: \-
C8: \-
D8: \-
E8: \-
F8: \-
G8: \-
H8: \-
A10: 1
B10: 'Heater #7
C10: 335.07
D10: 250
E10: @IF($A10=1,C10-$E$2/2,C10+$E$2/2)
F10: @IF($A10=1,D10-$E$2/2,D10+$E$2/2)
G10: 1889.64
H10: -0.05555
A11: 1
```

```
B11: 'Heater #7
C11: 250
D11: 249.9
E11: @IF($A11=1,C11-$E$2/2,C11+$E$2/2)
F11: @IF($A11=1,D11-$E$2/2,D11+$E$2/2)
G11: 1310.27
H11: -311.655
A12: 1
B12: 'Heater #7
C12: 249.9
D12: 213.83
E12: @IF($A12=1,C12-$E$2/2,C12+$E$2/2)
F12: @IF($A12=1,D12-$E$2/2,D12+$E$2/2)
G12: 1120.254
H12: -0.08557
A13: 1
B13: 'Heater #6
C13: 441.75
D13: 208.4
E13: @IF($A13=1,C13-$E$2/2,C13+$E$2/2)
F13: @IF($A13=1,D13-$E$2/2,D13+$E$2/2)
G13: 845.699
H13: -0.01998
A14: 1
B14: 'Heater #6
C14: 208.4
D14: 208.3
E14: @IF($A14=1,C14-$E$2/2,C14+$E$2/2)
F14: @IF($A14=1,D14-$E$2/2,D14+$E$2/2)
G14: 545.79
H14: -162.6
A15: 1
B15: 'Heater #6
C15: 208.3
D15: 187.54
E15: @IF($A15=1,C15-$E$2/2,C15+$E$2/2)
F15: @IF($A15=1,D15-$E$2/2,D15+$E$2/2)
G15: 543.42
H15: -0.12039
A16: 1
B16: 'Heater #6
C16: 213.83
D16: 208.4
E16: @IF($A16=1,C16-$E$2/2,C16+$E$2/2)
F16: @IF($A16=1,D16-$E$2/2,D16+$E$2/2)
G16: 450.4
H16: -0.08534
A17: 1
B17: 'Heater #5
C17: 348.421
D17: 182.42
E17: @IF($A17=1,C17-$E$2/2,C17+$E$2/2)
F17: @IF($A17=1,D17-$E$2/2,D17+$E$2/2)
G17: 444.6
H17: -0.02137
A18: 1
```

```
B18: 'Heater #5
C18: 182.42
D18: 182.32
E18: @IF($A18=1,C18-$E$2/2,C18+$E$2/2)
F18: @IF($A18=1,D18-$E$2/2,D18+$E$2/2)
G18: 436.35
H18: -189.651
A19: 1
B19: 'Heater #5
C19: 182.32
D19: 156.72
E19: @IF($A19=1,C19-$E$2/2,C19+$E$2/2)
F19: @IF($A19=1,D19-$E$2/2,D19+$E$2/2)
G19: 361.897
H19: -0.1584
A20: 1
B20: 'Heater #5
C20: 187.54
D20: 182.42
E20: @IF($A20=1,C20-$E$2/2,C20+$E$2/2)
F20: @IF($A20=1,D20-$E$2/2,D20+$E$2/2)
G20: 348.4
H20: -0.12144
A21: 1
B21: 'Deareator
C21: 249.977
D21: 148.1
E21: @IF($A21=1,C21-$E$2/2,C21+$E$2/2)
F21: @IF($A21=1,D21-$E$2/2,D21+$E$2/2)
G21: 343.021
H21: -0.01532
A22: 1
B22: 'Deareator
C22: 148.1
D22: 148
E22: @IF($A22=1,C22-$E$2/2,C22+$E$2/2)
F22: @IF($A22=1,D22-$E$2/2,D22+$E$2/2)
G22: 341.71
H22: -151.59
A23: 1
B23: 'Deareator
C23: 156.72
D23: 148.1
E23: @IF($A23=1,C23-$E$2/2,C23+$E$2/2)
F23: @IF($A23=1,D23-$E$2/2,D23+$E$2/2)
G23: 332.6
H23: -0.15701
A24: 1
B24: 'Heater #3
C24: 187.74
D24: 125.54
E24: @IF($A24=1,C24-$E$2/2,C24+$E$2/2)
F24: @IF($A24=1,D24-$E$2/2,D24+$E$2/2)
G24: 329.67
H24: -0.01368
A25: 1
```

```
B25: 'Heater #3
C25: 125.54
D25: 125.44
E25: @IF($A25=1,C25-$E$2/2,C25+$E$2/2)
F25: @IF($A25=1,D25-$E$2/2,D25+$E$2/2)
G25: 307.4
H25: -143.805
A26: 1
B26: 'Heater #2
C26: 122.909
D26: 102.825
E26: @IF($A26=1,C26-$E$2/2,C26+$E$2/2)
F26: @IF($A26=1,D26-$E$2/2,D26+$E$2/2)
G26: 286.4
H26: -0.01265
A27: 1
B27: 'Heater #2
C27: 102.825
D27: 102.725
E27: @IF($A27=1,C27-$E$2/2,C27+$E$2/2)
F27: @IF($A27=1,D27-$E$2/2,D27+$E$2/2)
G27: 272.578
H27: -142.091
A28: 1
B28: 'Heater #2
C28: 125.54
D28: 102.825
E28: @IF($A28=1,C28-$E$2/2,C28+$E$2/2)
F28: @IF($A28=1,D28-$E$2/2,D28+$E$2/2)
G28: 255.44
H28: -0.02783
A29: 1
B29: 'Heater #1
C29: 86.102
D29: 80.57
E29: @IF($A29=1,C29-$E$2/2,C29+$E$2/2)
F29: @IF($A29=1,D29-$E$2/2,D29+$E$2/2)
G29: 244.6
H29: -0.0211
A30: 1
B30: 'Heater #1
C30: 80.57
D30: 80.47
E30: @IF($A30=1,C30-$E$2/2,C30+$E$2/2)
F30: @IF($A30=1,D30-$E$2/2,D30+$E$2/2)
G30: 244.577
H30: -225.556
A31: 1
B31: 'Heater #1
C31: 102.85
D31: 80.57
E31: @IF($A31=1,C31-$E$2/2,C31+$E$2/2)
F31: @IF($A31=1,D31-$E$2/2,D31+$E$2/2)
G31: 244.5
H31: -0.05413
A32: 1
```

```
B32: 'Drain Cooler
C32: 80.46
D32: 47.322
E32: @IF($A32=1,C32-$E$2/2,C32+$E$2/2)
F32: @IF($A32=1,D32-$E$2/2,D32+$E$2/2)
G32: 213.83
H32: -0.09995
A33: 1
B33: 'Furnace Wall
C33: 1895.04
D33: 1315.67
E33: @IF($A33=1,C33-$E$2/2,C33+$E$2/2)
F33: @IF($A33=1,D33-$E$2/2,D33+$E$2/2)
G33: 208.43
H33: -0.34388
A34: 1
B34: 'Furnace Wall
C34: 1895.04
D34: 450
E34: @IF($A34=1,C34-$E$2/2,C34+$E$2/2)
F34: @IF($A34=1,D34-$E$2/2,D34+$E$2/2)
G34: 203
H34: -0.04592
A35: 1
B35: 'SSH
C35: 1315.67
D35: 1125.654
E35: @IF($A35=1,C35-$E$2/2,C35+$E$2/2)
F35: @IF($A35=1,D35-$E$2/2,D35+$E$2/2)
G35: 202.9
H35: -0.32693
A36: 1
B36: 'Reheater
C36: 1125.654
D36: 851.099
E36: @IF($A36=1,C36-$E$2/2,C36+$E$2/2)
F36: @IF($A36=1,D36-$E$2/2,D36+$E$2/2)
G36: 187.35
H36: -0.31659
A37: 1
B37: (F2) 'PSH
C37: 851.099
D37: 450
E37: @IF($A37=1,C37-$E$2/2,C37+$E$2/2)
F37: @IF($A37=1,D37-$E$2/2,D37+$E$2/2)
G37: 182.34
H37: -0.29856
A38: 1
B38: 'Economiser
C38: 450
D38: 338
E38: @IF($A38=1,C38-$E$2/2,C38+$E$2/2)
F38: @IF($A38=1,D38-$E$2/2,D38+$E$2/2)
G38: 182.14
H38: -0.27569
A39: 1
```

```
B39: (F2) 'Secondary Air
C39: 338
D39: 120
E39: @IF($A39=1,C39-$E$2/2,C39+$E$2/2)
F39: @IF($A39=1,D39-$E$2/2,D39+$E$2/2)
G39: 177.02
H39: -0.27489
A40: 1
B40: 'Primary Air
C40: 450
D40: 160
E40: @IF($A40=1,C40-$E$2/2,C40+$E$2/2)
F40: @IF($A40=1,D40-$E$2/2,D40+$E$2/2)
G40: 176.92
H40: -0.05459
A41: 1
B41: 'Condenser
C41: 31.8
D41: 31.7
E41: @IF($A41=1,C41-$E$2/2,C41+$E$2/2)
F41: @IF($A41=1,D41-$E$2/2,D41+$E$2/2)
G41: 165.4
H41: -2893.45
A42: 1
B42: 'Condenser
C42: 47.322
D42: 31.8
E42: @IF($A42=1,C42-$E$2/2,C42+$E$2/2)
F42: @IF($A42=1,D42-$E$2/2,D42+$E$2/2)
G42: 156.56
H42: -0.09989
A43: 1
B43: 'Condenser
C43: 99.068
D43: 31.8
E43: @IF($A43=1,C43-$E$2/2,C43+$E$2/2)
F43: @IF($A43=1,D43-$E$2/2,D43+$E$2/2)
G43: 154.6
H43: -0.00091
A44: 1
B44: 'Condenser
C44: 56.24
D44: 31.8
E44: @IF($A44=1,C44-$E$2/2,C44+$E$2/2)
F44: @IF($A44=1,D44-$E$2/2,D44+$E$2/2)
G44: 153.4
H44: -0.00026
A45: 1
B45: 'Condenser
C45: 79.654
D45: 31.8
E45: @IF($A45=1,C45-$E$2/2,C45+$E$2/2)
F45: @IF($A45=1,D45-$E$2/2,D45+$E$2/2)
G45: 151.32
H45: -0.00025
A46: 1
```

```
B46: 'Condenser
C46: 99.632
D46: 31.8
E46: @IF($A46=1,C46-$E$2/2,C46+$E$2/2)
F46: @IF($A46=1,D46-$E$2/2,D46+$E$2/2)
G46: 142.7
H46: -0.00024
A47: 1
B47: 'Condenser
C47: 37.168
D47: 31.8
E47: @IF($A47=1,C47-$E$2/2,C47+$E$2/2)
F47: @IF($A47=1,D47-$E$2/2,D47+$E$2/2)
G47: 142.6
H47: -0.02994
A48: 1
B48: 'BFPT Condenser
C48: 31.8
D48: 31.7
E48: @IF($A48=1,C48-$E$2/2,C48+$E$2/2)
F48: @IF($A48=1,D48-$E$2/2,D48+$E$2/2)
G48: 127.492
H48: -162.272
A49: 1
B49: 'BFPT Condenser
C49: 59.76
D49: 31.8
E49: @IF($A49=1,C49-$E$2/2,C49+$E$2/2)
F49: @IF($A49=1,D49-$E$2/2,D49+$E$2/2)
G49: 125.4
H49: -0.0001
A50: 1
B50: 'BFPT Condenser
C50: 99.632
D50: 31.8
E50: @IF($A50=1,C50-$E$2/2,C50+$E$2/2)
F50: @IF($A50=1,D50-$E$2/2,D50+$E$2/2)
G50: 120.14
H50: -0.0001
A51: 0
B51: 'Drain Cooler
C51: 33.63
D51: 38.54
E51: @IF($A51=1,C51-$E$2/2,C51+$E$2/2)
F51: @IF($A51=1,D51-$E$2/2,D51+$E$2/2)
G51: 120.04
H51: 0.674325
A52: 0
B52: 'Heater #1
C52: 38.54
D52: 77.783
E52: @IF($A52=1,C52-$E$2/2,C52+$E$2/2)
F52: @IF($A52=1,D52-$E$2/2,D52+$E$2/2)
G52: 117.509
H52: 0.679393
A53: 0
```

```
B53: 'Heater #2
C53: 77.783
D53: 99.91
E53: @IF($A53=1,C53-$E$2/2,C53+$E$2/2)
F53: @IF($A53=1,D53-$E$2/2,D53+$E$2/2)
G53: 114.6
H53: 0.682275
A54: 0
B54: 'Heater #3
C54: 99.91
D54: 122.092
E54: @IF($A54=1,C54-$E$2/2,C54+$E$2/2)
F54: @IF($A54=1,D54-$E$2/2,D54+$E$2/2)
G54: 105.31
H54: 0.686739
A55: 0
B55: 'Deareator
C55: 122.092
D55: 148
E55: @IF($A55=1,C55-$E$2/2,C55+$E$2/2)
F55: @IF($A55=1,D55-$E$2/2,D55+$E$2/2)
G55: 97.45
H55: 0.69789
A56: 0
B56: 'Heater #5
C56: 151.16
D56: 181.95
E56: @IF($A56=1,C56-$E$2/2,C56+$E$2/2)
F56: @IF($A56=1,D56-$E$2/2,D56+$E$2/2)
G56: 97.425
H56: 0.883121
A57: 0
B57: 'Heater #6
C57: 181.95
D57: 208.43
E57: @IF($A57=1,C57-$E$2/2,C57+$E$2/2)
F57: @IF($A57=1,D57-$E$2/2,D57+$E$2/2)
G57: 97.325
H57: 0.902002
A58: 0
B58: 'Heater #7
C58: 208.43
D58: 250.04
E58: @IF($A58=1,C58-$E$2/2,C58+$E$2/2)
F58: @IF($A58=1,D58-$E$2/2,D58+$E$2/2)
G58: 94.232
H58: 0.93673
A59: 0
B59: 'Economiser
C59: 250.04
D59: 281
E59: @IF($A59=1,C59-$E$2/2,C59+$E$2/2)
F59: @IF($A59=1,D59-$E$2/2,D59+$E$2/2)
G59: 93.668
H59: 0.997365
A60: 0
```

```
B60: 'Furnace Wall
C60: 281
D60: 356.497
E60: @IF($A60=1,C60-$E$2/2,C60+$E$2/2)
F60: @IF($A60=1,D60-$E$2/2,D60+$E$2/2)
G60: 83.183
H60: 3.49333
A61: 0
B61: 'PSH
C61: 356.497
D61: 445
E61: @IF($A61=1,C61-$E$2/2,C61+$E$2/2)
F61: @IF($A61=1,D61-$E$2/2,D61+$E$2/2)
G61: 80.702
H61: 1.353089
A62: 0
B62: 'SSH
C62: 445
D62: 540.39
E62: @IF($A62=1,C62-$E$2/2,C62+$E$2/2)
F62: @IF($A62=1,D62-$E$2/2,D62+$E$2/2)
G62: 75.17
H62: 0.651277
A63: 0
B63: 'Reheater
C63: 336.31
D63: 538.02
E63: @IF($A63=1,C63-$E$2/2,C63+$E$2/2)
F63: @IF($A63=1,D63-$E$2/2,D63+$E$2/2)
G63: 75.07
H63: 0.43093
A64: 0
B64: 'Primary Air
C64: 21
D64: 343
E64: @IF($A64=1,C64-$E$2/2,C64+$E$2/2)
F64: @IF($A64=1,D64-$E$2/2,D64+$E$2/2)
G64: 75.06
H64: 0.047696
A65: 0
B65: 'Primary Air
C65: 21
D65: 160
E65: @IF($A65=1,C65-$E$2/2,C65+$E$2/2)
F65: @IF($A65=1,D65-$E$2/2,D65+$E$2/2)
G65: 74.254
H65: 0.010543
A66: 0
B66: (F2) 'Secondary Air
C66: 21
D66: 302
E66: @IF($A66=1,C66-$E$2/2,C66+$E$2/2)
F66: @IF($A66=1,D66-$E$2/2,D66+$E$2/2)
G66: 54.36
H66: 0.098497
A67: 0
```

```
B67: (F2) 'Secondary Air
C67: 21
D67: 267.178
E67: @IF($A67=1,C67-$E$2/2,C67+$E$2/2)
F67: @IF($A67=1,D67-$E$2/2,D67+$E$2/2)
G67: 50.84
H67: 0.111858
A68: 0
B68: (F2) 'Secondary Air
C68: 21
D68: 120
E68: @IF($A68=1,C68-$E$2/2,C68+$E$2/2)
F68: @IF($A68=1,D68-$E$2/2,D68+$E$2/2)
G68: 43.94
H68: 0.04636
G69: 41.922
G70: 39.03
G71: 31.768
G72: 26.4
```

b) The following formulas are used for constructing the heat cascade for curves plotting.

```
J1: '                        CONSTRUCTING THE HEAT CASCADE
J3: (F2) \-
K3: \-
L3: \-
M3: \-
N3: \-
O3: \-
J4: (F2) "INTERVAL
K4: ^dT
L4: "ECPc-ECPh
M4: ^dH
N4: '    HEAT
O4: "CORRECTED
J5: (F2) "  TEMPERATURE
N5: (F2) "CASCADE
O5: "HEAT
O6: " CASCADE
J7: ^ (deg C)
K7: ^(deg C)
L7: (F2) ^(MW)
M7: (F2) ^(MW)
N7: (F2) ^ (MW)
O7: (F2) '   (MW)
J8: \-
K8: \-
L8: \-
M8: \-
N8: \-
O8: \-
J10: 1889.64
N10: (F2) 0
```

```
O10: (F2) -@MIN(N10..N73)
J11: 1310.27
K11: (J10-J11)
L11: -0.3898
M11: (F2) (TRANS1*K11)
N11: (F2) (N10-M11)
O11: (F2) (O10-M11)
J12: 1120.254
K12: (J11-J12)
L12: -0.37285
M12: (F2) (L12*K12)
N12: (F2) (N11-M12)
O12: (F2) (O11-M12)
J13: 845.699
K13: (J12-J13)
L13: -0.36251
M13: (F2) (L13*K13)
N13: (F2) (N12-M13)
O13: (F2) (O12-M13)
J14: 545.79
K14: (J13-J14)
L14: -0.34448
M14: (F2) (L14*K14)
N14: (F2) (N13-M14)
O14: (F2) (O13-M14)
J15: 543.42
K15: (J14-J15)
L15: 0.306797
M15: (F2) (L15*K15)
N15: (F2) (N14-M15)
O15: (F2) (O14-M15)
J16: 450.4
K16: (J15-J16)
L16: 0.737727
M16: (F2) (L16*K16)
N16: (F2) (N15-M16)
O16: (F2) (O15-M16)
J17: 444.6
K17: (J16-J17)
L17: 1.439539
M17: (F2) (L17*K17)
N17: (F2) (N16-M17)
O17: (F2) (O16-M17)
J18: 436.35
K18: (J17-J18)
L18: 1.453739
M18: (F2) (L18*K18)
N18: (F2) (N17-M18)
O18: (F2) (O17-M18)
J19: 361.897
K19: (J18-J19)
L19: 1.433759
M19: (F2) (L19*K19)
N19: (F2) (N18-M19)
O19: (F2) (O18-M19)
J20: 348.4
```

```
K20: (J19-J20)
L20: 3.574
M20: (F2) (L20*K20)
N20: (F2) (N19-M20)
O20: (F2) (O19-M20)
J21: 343.021
K21: (J20-J21)
L21: 3.621696
M21: (F2) (L21*K21)
N21: (F2) (N20-M21)
O21: (F2) (O20-M21)
J22: 341.71
K22: (J21-J22)
L22: 3.600326
M22: (F2) (L22*K22)
N22: (F2) (N21-M22)
O22: (F2) (O21-M22)
J23: 332.6
K23: (J22-J23)
L23: 3.169396
M23: (F2) (L23*K23)
N23: (F2) (N22-M23)
O23: (F2) (O22-M23)
J24: 329.67
K24: (J23-J24)
L24: 3.170196
M24: (F2) (L24*K24)
N24: (F2) (N23-M24)
O24: (F2) (O23-M24)
J25: 307.4
K25: (J24-J25)
L25: 3.114646
M25: (F2) (L25*K25)
N25: (F2) (N24-M25)
O25: (F2) (O24-M25)
J26: 286.4
K26: (J25-J26)
L26: 3.213143
M26: (F2) (L26*K26)
N26: (F2) (N25-M26)
O26: (F2) (O25-M26)
J27: 272.578
K27: (J26-J27)
L27: 0.717178
M27: (F2) (L27*K27)
N27: (F2) (N26-M27)
O27: (F2) (O26-M27)
J28: 255.44
K28: (J27-J28)
L28: 0.829036
M28: (F2) (L28*K28)
N28: (F2) (N27-M28)
O28: (F2) (O27-M28)
J29: 244.6
K29: (J28-J29)
L29: 0.768401
```

M29: (F2) (L29*K29)
N29: (F2) (N28-M29)
O29: (F2) (O28-M29)
J30: 244.577
K30: (J29-J30)
L30: -310.831049
M30: (F2) (L30*K30)
N30: (F2) (N29-M30)
O30: (F2) (O29-M30)
J31: 244.5
K31: (J30-J31)
L31: -310.846369
M31: (F2) (L31*K31)
N31: (F2) (N30-M31)
O31: (F2) (O30-M31)
J32: 213.83
K32: (J31-J32)
L32: 0.723061
M32: (F2) (L32*K32)
N32: (F2) (N31-M32)
O32: (F2) (O31-M32)
J33: 208.43
K33: (J32-J33)
L33: 0.688333
M33: (F2) (L33*K33)
N33: (F2) (N32-M33)
O33: (F2) (O32-M33)
J34: 203
K34: (J33-J34)
L34: 0.688563
M34: (F2) (L34*K34)
N34: (F2) (N33-M34)
O34: (F2) (O33-M34)
J35: 202.9
K35: (J34-J35)
L35: -161.806117
M35: (F2) (L35*K35)
N35: (F2) (N34-M35)
O35: (F2) (O34-M35)
J36: 187.35
K36: (J35-J36)
L36: 0.673493
M36: (F2) (L36*K36)
N36: (F2) (N35-M36)
O36: (F2) (O35-M36)
J37: 182.34
K37: (J36-J37)
L37: 0.654612
M37: (F2) (L37*K37)
N37: (F2) (N36-M37)
O37: (F2) (O36-M37)
J38: 182.14
K38: (J37-J38)
L38: 0.640932
M38: (F2) (L38*K38)
N38: (F2) (N37-M38)

O38: (F2) (O37-M38)
J39: 177.02
K39: (J38-J39)
L39: 0.639882
M39: (F2) (L39*K39)
N39: (F2) (N38-M39)
O39: (F2) (O38-M39)
J40: 176.92
K40: (J39-J40)
L40: -188.868308
M40: (F2) (L40*K40)
N40: (F2) (N39-M40)
O40: (F2) (O39-M40)
J41: 165.4
K41: (J40-J41)
L41: 0.624292
M41: (F2) (L41*K41)
N41: (F2) (N40-M41)
O41: (F2) (O40-M41)
J42: 156.56
K42: (J41-J42)
L42: 0.634835
M42: (F2) (L42*K42)
N42: (F2) (N41-M42)
O42: (F2) (O41-M42)
J43: 154.6
K43: (J42-J43)
L43: -0.248286
M43: (F2) (L43*K43)
N43: (F2) (N42-M43)
O43: (F2) (O42-M43)
J44: 153.4
K44: (J43-J44)
L44: -0.193696
M44: (F2) (L44*K44)
N44: (F2) (N43-M44)
O44: (F2) (O43-M44)
J45: 151.32
K45: (J44-J45)
L45: 0.504194
M45: (F2) (L45*K45)
N45: (F2) (N44-M45)
O45: (F2) (O44-M45)
J46: 142.7
K46: (J45-J46)
L46: 0.505584
M46: (F2) (L46*K46)
N46: (F2) (N45-M46)
O46: (F2) (O45-M46)
J47: 142.6
K47: (J46-J47)
L47: -150.912086
M47: (F2) (L47*K47)
N47: (F2) (N46-M47)
O47: (F2) (O46-M47)
J48: 127.492

K48: (J47-J48)
L48: 0.677914
M48: (F2) (L48*K48)
N48: (F2) (N47-M48)
O48: (F2) (O47-M48)
J49: 125.4
K49: (J48-J49)
L49: 0.666763
M49: (F2) (L49*K49)
N49: (F2) (N48-M49)
O49: (F2) (O48-M49)
J50: 120.14
K50: (J49-J50)
L50: 0.713123
M50: (F2) (L50*K50)
N50: (F2) (N49-M50)
O50: (F2) (O49-M50)
J51: 120.04
K51: (J50-J51)
L51: -143.106027
M51: (F2) (L51*K51)
N51: (F2) (N50-M51)
O51: (F2) (O50-M51)
J52: 117.509
K52: (J51-J52)
L52: 0.698973
M52: (F2) (L52*K52)
N52: (F2) (N51-M52)
O52: (F2) (O51-M52)
J53: 114.6
K53: (J52-J53)
L53: 0.686323
M53: (F2) (L53*K53)
N53: (F2) (N52-M53)
O53: (F2) (O52-M53)
J54: 105.31
K54: (J53-J54)
L54: 0.961213
M54: (F2) (L54*K54)
N54: (F2) (N53-M54)
O54: (F2) (O53-M54)
J55: 97.45
K55: (J54-J55)
L55: 0.956749
M55: (F2) (L55*K55)
N55: (F2) (N54-M55)
O55: (F2) (O54-M55)
J56: 97.425
K56: (J55-J56)
L56: 0.902619
M56: (F2) (L56*K56)
N56: (F2) (N55-M56)
O56: (F2) (O55-M56)
J57: 97.325
K57: (J56-J57)
L57: -141.147901

M57: (F2) (L57*K57)
N57: (F2) (N56-M57)
O57: (F2) (O56-M57)
J58: 94.232
K58: (J57-J58)
L58: 0.943099
M58: (F2) (L58*K58)
N58: (F2) (N57-M58)
O58: (F2) (O57-M58)
J59: 93.668
K59: (J58-J59)
L59: 0.942759
M59: (F2) (L59*K59)
N59: (F2) (N58-M59)
O59: (F2) (O58-M59)
J60: 83.183
K60: (J59-J60)
L60: 0.941849
M60: (F2) (L60*K60)
N60: (F2) (N59-M60)
O60: (F2) (O59-M60)
J61: 80.702
K61: (J60-J61)
L61: 0.938967
M61: (F2) (L61*K61)
N61: (F2) (N60-M61)
O61: (F2) (O60-M61)
J62: 75.17
K62: (J61-J62)
L62: 0.917867
M62: (F2) (L62*K62)
N62: (F2) (N61-M62)
O62: (F2) (O61-M62)
J63: 75.07
K63: (J62-J63)
L63: -224.562903
M63: (F2) (L63*K63)
N63: (F2) (N62-M63)
O63: (F2) (O62-M63)
J64: 75.06
K64: (J63-J64)
L64: 0.993097
M64: (F2) (L64*K64)
N64: (F2) (N63-M64)
O64: (F2) (O63-M64)
J65: 74.254
K65: (J64-J65)
L65: 0.893147
M65: (F2) (L65*K65)
N65: (F2) (N64-M65)
O65: (F2) (O64-M65)
J66: 54.36
K66: (J65-J66)
L66: 0.892897
M66: (F2) (L66*K66)
N66: (F2) (N65-M66)

```
O66: (F2) (O65-M66)
J67: 50.84
K67: (J66-J67)
L67: 0.892797
M67: (F2) (L67*K67)
N67: (F2) (N66-M67)
O67: (F2) (O66-M67)
J68: 43.94
K68: (J67-J68)
L68: 0.892537
M68: (F2) (L68*K68)
N68: (F2) (N67-M68)
O68: (F2) (O67-M68)
J69: 41.922
K69: (J68-J69)
L69: 0.887469
M69: (F2) (L69*K69)
N69: (F2) (N68-M69)
O69: (F2) (O68-M69)
J70: 39.03
K70: (J69-J70)
L70: 0.887529
M70: (F2) (L70*K70)
N70: (F2) (N69-M70)
O70: (F2) (O69-M70)
J71: 31.768
K71: (J70-J71)
L71: 0.213204
M71: (F2) (L71*K71)
N71: (F2) (N70-M71)
O71: (F2) (O70-M71)
J72: 26.4
K72: (J71-J72)
L72: 0.183264
M72: (F2) (L72*K72)
N72: (F2) (N71-M72)
O72: (F2) (O71-M72)
J73: 26.3
K73: (J72-J73)
L73: -3055.722
M73: (F2) (L73*K73)
N73: (F2) (N72-M73)
O73: (F2) (O72-M73)
```

c) The listing of the macro is given below.

```
IG8108: "macro window
IG8109: '\7
IG8110: '{calc}
IG8111: "{goto}trans1~
IG8112: "{m}e{end}{down}~
IG8113: "{goto}trans2~
IG8114: "{m}e{end}{right}~
```

```
IG8115: "{goto}source~
IG8116: "{m}rndsource1~
IG8117: "{m}rncsource1~{tab}{end}{down}~
IG8118: "{goto}target~
IG8119: "{m}rndtarget1~
IG8120: "{m}rnctarget1~{tab}{end}{down}~
IG8121: "{m}eorder~{m}rvsource1~ranked~
IG8122: "{m}rvtarget1~{right}{end}{down}{down}~
IG8123: "{goto}ranked~{up}
IG8124: "{m}rndorder~
IG8125: "{m}rncorder~{tab}{down}{end}{down}~
IG8126: "{m}qsbdorder~qs1order~d~qruq
IG8127: "{m}einterval1~
IG8128: "{m}corder~interval~
IG8129: "{goto}interval~
IG8130: "{m}rndinterval1~
IG8131: "{m}rncinterval1~{tab}{end}{down}{end}{down}~
IG8132: '{calc}
IG8133: "{goto}trans~
IG8134: "{m}rv{end}{right}~trans2~
IG8135: "{goto}trans2~
IG8136: "{m}rt{end}{right}~trans1~
IG8137: '{calc}
IG8138: "{goto}ranked~
```

d) The following formulas are used to calculate the $\Sigma CP_c - \Sigma CP_h$ values for each of the temperature intervals

```
P4: "   INTERVAL
P6: 1
Q6: 2
R6: 3
S6: 4
T6: 5
U6: 6
V6: 7
W6: 8
X6: 9
Y6: 10
Z6: 11
AA6: 12
AB6: 13
AC6: 14
AD6: 15
AE6: 16
AF6: 17
AG6: 18
AH6: 19
AI6: 20
AJ6: 21
AK6: 22
AL6: 23
AM6: 24
AN6: 25
```

```
AO6: 26
AP6: 27
AQ6: 28
AR6: 29
AS6: 30
AT6: 31
AU6: 32
AV6: 33
AW6: 34
AX6: 35
AY6: 36
AZ6: 37
BA6: 38
BB6: 39
BC6: 40
BD6: 41
BE6: 42
BF6: 43
BG6: 44
BH6: 45
BI6: 46
BJ6: 47
BK6: 48
BL6: 49
BM6: 50
BN6: 51
BO6: 52
BP6: 53
BQ6: 54
BR6: 55
BS6: 56
BT6: 57
BU6: 58
BV6: 59
BW6: 60
BX6: 61
BY6: 62
BZ6: 63
P10: @IF($A10=1,$H10*($G$10<=SOURCE)*($G$11>=TARGET),$H10*($G$10<=TARGET)*($G$11>=SOURCE))
Q10: @IF($A10=1,$H10*($G$11<=SOURCE)*($G$12>=TARGET),$H10*($G$11<=TARGET)*($G$12>=SOURCE))
R10: @IF($A10=1,$H10*($G$12<=SOURCE)*($G$13>=TARGET),$H10*($G$12<=TARGET)*($G$13>=SOURCE))
S10: @IF($A10=1,$H10*($G$13<=SOURCE)*($G$14>=TARGET),$H10*($G$13<=TARGET)*($G$14>=SOURCE))
T10: @IF($A10=1,$H10*($G$14<=SOURCE)*($G$15>=TARGET),$H10*($G$14<=TARGET)*($G$15>=SOURCE))
U10: @IF($A10=1,$H10*($G$15<=SOURCE)*($G$16>=TARGET),$H10*($G$15<=TARGET)*($G$16>=SOURCE))
V10: @IF($A10=1,$H10*($G$16<=SOURCE)*($G$17>=TARGET),$H10*($G$16<=TARGET)*($G$17>=SOURCE))
W10: @IF($A10=1,$H10*($G$17<=SOURCE)*($G$18>=TARGET),$H10*($G$17<=TARGET)*($G$18>=SOURCE))
X10: @IF($A10=1,$H10*($G$18<=SOURCE)*($G$19>=TARGET),$H10*($G$18<=TARGET)*($G$19>=SOURCE))
Y10: @IF($A10=1,$H10*($G$19<=SOURCE)*($G$20>=TARGET),$H10*($G$19<=TARGET)*($G$20>=SOURCE))
Z10: @IF($A10=1,$H10*($G$20<=SOURCE)*($G$21>=TARGET),$H10*($G$20<=TARGET)*($G$21>=SOURCE))
AA10: @IF($A10=1,$H10*($G$21<=SOURCE)*($G$22>=TARGET),$H10*($G$21<=TARGET)*($G$22>=SOURCE))
AB10: @IF($A10=1,$H10*($G$22<=SOURCE)*($G$23>=TARGET),$H10*($G$22<=TARGET)*($G$23>=SOURCE))
AC10: @IF($A10=1,$H10*($G$23<=SOURCE)*($G$24>=TARGET),$H10*($G$23<=TARGET)*($G$24>=SOURCE))
AD10: @IF($A10=1,$H10*($G$24<=SOURCE)*($G$25>=TARGET),$H10*($G$24<=TARGET)*($G$25>=SOURCE))
AE10: @IF($A10=1,$H10*($G$25<=SOURCE)*($G$26>=TARGET),$H10*($G$25<=TARGET)*($G$26>=SOURCE))
AF10: @IF($A10=1,$H10*($G$26<=SOURCE)*($G$27>=TARGET),$H10*($G$26<=TARGET)*($G$27>=SOURCE))
AG10: @IF($A10=1,$H10*($G$27<=SOURCE)*($G$28>=TARGET),$H10*($G$27<=TARGET)*($G$28>=SOURCE))
```

```
AH10: @IF($A10=1,$H10*($G$28<=SOURCE)*($G$29>=TARGET),$H10*($G$28<=TARGET)*($G$29>=SOURCE))
AI10: @IF($A10=1,$H10*($G$29<=SOURCE)*($G$30>=TARGET),$H10*($G$29<=TARGET)*($G$30>=SOURCE))
AJ10: @IF($A10=1,$H10*($G$30<=SOURCE)*($G$31>=TARGET),$H10*($G$30<=TARGET)*($G$31>=SOURCE))
AK10: @IF($A10=1,$H10*($G$31<=SOURCE)*($G$32>=TARGET),$H10*($G$31<=TARGET)*($G$32>=SOURCE))
AL10: @IF($A10=1,$H10*($G$32<=SOURCE)*($G$33>=TARGET),$H10*($G$32<=TARGET)*($G$33>=SOURCE))
AM10: @IF($A10=1,$H10*($G$33<=SOURCE)*($G$34>=TARGET),$H10*($G$33<=TARGET)*($G$34>=SOURCE))
AN10: @IF($A10=1,$H10*($G$34<=SOURCE)*($G$35>=TARGET),$H10*($G$34<=TARGET)*($G$35>=SOURCE))
AO10: @IF($A10=1,$H10*($G$35<=SOURCE)*($G$36>=TARGET),$H10*($G$35<=TARGET)*($G$36>=SOURCE))
AP10: @IF($A10=1,$H10*($G$36<=SOURCE)*($G$37>=TARGET),$H10*($G$36<=TARGET)*($G$37>=SOURCE))
AQ10: @IF($A10=1,$H10*($G$37<=SOURCE)*($G$38>=TARGET),$H10*($G$37<=TARGET)*($G$38>=SOURCE))
AR10: @IF($A10=1,$H10*($G$38<=SOURCE)*($G$39>=TARGET),$H10*($G$38<=TARGET)*($G$39>=SOURCE))
AS10: @IF($A10=1,$H10*($G$39<=SOURCE)*($G$40>=TARGET),$H10*($G$39<=TARGET)*($G$40>=SOURCE))
AT10: @IF($A10=1,$H10*($G$40<=SOURCE)*($G$41>=TARGET),$H10*($G$40<=TARGET)*($G$41>=SOURCE))
AU10: @IF($A10=1,$H10*($G$41<=SOURCE)*($G$42>=TARGET),$H10*($G$41<=TARGET)*($G$42>=SOURCE))
AV10: @IF($A10=1,$H10*($G$42<=SOURCE)*($G$43>=TARGET),$H10*($G$42<=TARGET)*($G$43>=SOURCE))
AW10: @IF($A10=1,$H10*($G$43<=SOURCE)*($G$44>=TARGET),$H10*($G$43<=TARGET)*($G$44>=SOURCE))
AX10: @IF($A10=1,$H10*($G$44<=SOURCE)*($G$45>=TARGET),$H10*($G$44<=TARGET)*($G$45>=SOURCE))
AY10: @IF($A10=1,$H10*($G$45<=SOURCE)*($G$46>=TARGET),$H10*($G$45<=TARGET)*($G$46>=SOURCE))
AZ10: @IF($A10=1,$H10*($G$46<=SOURCE)*($G$47>=TARGET),$H10*($G$46<=TARGET)*($G$47>=SOURCE))
BA10: @IF($A10=1,$H10*($G$47<=SOURCE)*($G$48>=TARGET),$H10*($G$47<=TARGET)*($G$48>=SOURCE))
BB10: @IF($A10=1,$H10*($G$48<=SOURCE)*($G$49>=TARGET),$H10*($G$48<=TARGET)*($G$49>=SOURCE))
BC10: @IF($A10=1,$H10*($G$49<=SOURCE)*($G$50>=TARGET),$H10*($G$49<=TARGET)*($G$50>=SOURCE))
BD10: @IF($A10=1,$H10*($G$50<=SOURCE)*($G$51>=TARGET),$H10*($G$50<=TARGET)*($G$51>=SOURCE))
BE10: @IF($A10=1,$H10*($G$51<=SOURCE)*($G$52>=TARGET),$H10*($G$51<=TARGET)*($G$52>=SOURCE))
BF10: @IF($A10=1,$H10*($G$52<=SOURCE)*($G$53>=TARGET),$H10*($G$52<=TARGET)*($G$53>=SOURCE))
BG10: @IF($A10=1,$H10*($G$53<=SOURCE)*($G$54>=TARGET),$H10*($G$53<=TARGET)*($G$54>=SOURCE))
BH10: @IF($A10=1,$H10*($G$54<=SOURCE)*($G$55>=TARGET),$H10*($G$54<=TARGET)*($G$55>=SOURCE))
BI10: @IF($A10=1,$H10*($G$55<=SOURCE)*($G$56>=TARGET),$H10*($G$55<=TARGET)*($G$56>=SOURCE))
BJ10: @IF($A10=1,$H10*($G$56<=SOURCE)*($G$57>=TARGET),$H10*($G$56<=TARGET)*($G$57>=SOURCE))
BK10: @IF($A10=1,$H10*($G$57<=SOURCE)*($G$58>=TARGET),$H10*($G$57<=TARGET)*($G$58>=SOURCE))
BL10: @IF($A10=1,$H10*($G$58<=SOURCE)*($G$59>=TARGET),$H10*($G$58<=TARGET)*($G$59>=SOURCE))
BM10: @IF($A10=1,$H10*($G$59<=SOURCE)*($G$60>=TARGET),$H10*($G$59<=TARGET)*($G$60>=SOURCE))
BN10: @IF($A10=1,$H10*($G$60<=SOURCE)*($G$61>=TARGET),$H10*($G$60<=TARGET)*($G$61>=SOURCE))
BO10: @IF($A10=1,$H10*($G$61<=SOURCE)*($G$62>=TARGET),$H10*($G$61<=TARGET)*($G$62>=SOURCE))
BP10: @IF($A10=1,$H10*($G$62<=SOURCE)*($G$63>=TARGET),$H10*($G$62<=TARGET)*($G$63>=SOURCE))
BQ10: @IF($A10=1,$H10*($G$63<=SOURCE)*($G$64>=TARGET),$H10*($G$63<=TARGET)*($G$64>=SOURCE))
BR10: @IF($A10=1,$H10*($G$64<=SOURCE)*($G$65>=TARGET),$H10*($G$64<=TARGET)*($G$65>=SOURCE))
BS10: @IF($A10=1,$H10*($G$65<=SOURCE)*($G$66>=TARGET),$H10*($G$65<=TARGET)*($G$66>=SOURCE))
BT10: @IF($A10=1,$H10*($G$66<=SOURCE)*($G$67>=TARGET),$H10*($G$66<=TARGET)*($G$67>=SOURCE))
BU10: @IF($A10=1,$H10*($G$67<=SOURCE)*($G$68>=TARGET),$H10*($G$67<=TARGET)*($G$68>=SOURCE))
BV10: @IF($A10=1,$H10*($G$68<=SOURCE)*($G$69>=TARGET),$H10*($G$68<=TARGET)*($G$69>=SOURCE))
BW10: @IF($A10=1,$H10*($G$69<=SOURCE)*($G$70>=TARGET),$H10*($G$69<=TARGET)*($G$70>=SOURCE))
BX10: @IF($A10=1,$H10*($G$70<=SOURCE)*($G$71>=TARGET),$H10*($G$70<=TARGET)*($G$71>=SOURCE))
BY10: @IF($A10=1,$H10*($G$71<=SOURCE)*($G$72>=TARGET),$H10*($G$71<=TARGET)*($G$72>=SOURCE))
BZ10: @IF($A10=1,$H10*($G$72<=SOURCE)*($G$73>=TARGET),$H10*($G$72<=TARGET)*($G$73>=SOURCE))
P11: @IF($A11=1,$H11*($G$10<=$E11)*($G$11>=$F11),$H11*($G$10<=$F11)*($G$11>=$E11))
Q11: @IF($A11=1,$H11*($G$11<=$E11)*($G$12>=$F11),$H11*($G$11<=$F11)*($G$12>=$E11))
R11: @IF($A11=1,$H11*($G$12<=$E11)*($G$13>=$F11),$H11*($G$12<=$F11)*($G$13>=$E11))
S11: @IF($A11=1,$H11*($G$13<=$E11)*($G$14>=$F11),$H11*($G$13<=$F11)*($G$14>=$E11))
T11: @IF($A11=1,$H11*($G$14<=$E11)*($G$15>=$F11),$H11*($G$14<=$F11)*($G$15>=$E11))
U11: @IF($A11=1,$H11*($G$15<=$E11)*($G$16>=$F11),$H11*($G$15<=$F11)*($G$16>=$E11))
V11: @IF($A11=1,$H11*($G$16<=$E11)*($G$17>=$F11),$H11*($G$16<=$F11)*($G$17>=$E11))
W11: @IF($A11=1,$H11*($G$17<=$E11)*($G$18>=$F11),$H11*($G$17<=$F11)*($G$18>=$E11))
X11: @IF($A11=1,$H11*($G$18<=$E11)*($G$19>=$F11),$H11*($G$18<=$F11)*($G$19>=$E11))
Y11: @IF($A11=1,$H11*($G$19<=$E11)*($G$20>=$F11),$H11*($G$19<=$F11)*($G$20>=$E11))
Z11: @IF($A11=1,$H11*($G$20<=$E11)*($G$21>=$F11),$H11*($G$20<=$F11)*($G$21>=$E11))
```

```
AA11: @IF($A11=1,$H11*($G$21<=$E11)*($G$22>=$F11),$H11*($G$21<=$F11)*($G$22>=$E11))
AB11: @IF($A11=1,$H11*($G$22<=$E11)*($G$23>=$F11),$H11*($G$22<=$F11)*($G$23>=$E11))
AC11: @IF($A11=1,$H11*($G$23<=$E11)*($G$24>=$F11),$H11*($G$23<=$F11)*($G$24>=$E11))
AD11: @IF($A11=1,$H11*($G$24<=$E11)*($G$25>=$F11),$H11*($G$24<=$F11)*($G$25>=$E11))
AE11: @IF($A11=1,$H11*($G$25<=$E11)*($G$26>=$F11),$H11*($G$25<=$F11)*($G$26>=$E11))
AF11: @IF($A11=1,$H11*($G$26<=$E11)*($G$27>=$F11),$H11*($G$26<=$F11)*($G$27>=$E11))
AG11: @IF($A11=1,$H11*($G$27<=$E11)*($G$28>=$F11),$H11*($G$27<=$F11)*($G$28>=$E11))
AH11: @IF($A11=1,$H11*($G$28<=$E11)*($G$29>=$F11),$H11*($G$28<=$F11)*($G$29>=$E11))
AI11: @IF($A11=1,$H11*($G$29<=$E11)*($G$30>=$F11),$H11*($G$29<=$F11)*($G$30>=$E11))
AJ11: @IF($A11=1,$H11*($G$30<=$E11)*($G$31>=$F11),$H11*($G$30<=$F11)*($G$31>=$E11))
AK11: @IF($A11=1,$H11*($G$31<=$E11)*($G$32>=$F11),$H11*($G$31<=$F11)*($G$32>=$E11))
AL11: @IF($A11=1,$H11*($G$32<=$E11)*($G$33>=$F11),$H11*($G$32<=$F11)*($G$33>=$E11))
AM11: @IF($A11=1,$H11*($G$33<=$E11)*($G$34>=$F11),$H11*($G$33<=$F11)*($G$34>=$E11))
AN11: @IF($A11=1,$H11*($G$34<=$E11)*($G$35>=$F11),$H11*($G$34<=$F11)*($G$35>=$E11))
AO11: @IF($A11=1,$H11*($G$35<=$E11)*($G$36>=$F11),$H11*($G$35<=$F11)*($G$36>=$E11))
AP11: @IF($A11=1,$H11*($G$36<=$E11)*($G$37>=$F11),$H11*($G$36<=$F11)*($G$37>=$E11))
AQ11: @IF($A11=1,$H11*($G$37<=$E11)*($G$38>=$F11),$H11*($G$37<=$F11)*($G$38>=$E11))
AR11: @IF($A11=1,$H11*($G$38<=$E11)*($G$39>=$F11),$H11*($G$38<=$F11)*($G$39>=$E11))
AS11: @IF($A11=1,$H11*($G$39<=$E11)*($G$40>=$F11),$H11*($G$39<=$F11)*($G$40>=$E11))
AT11: @IF($A11=1,$H11*($G$40<=$E11)*($G$41>=$F11),$H11*($G$40<=$F11)*($G$41>=$E11))
AU11: @IF($A11=1,$H11*($G$41<=$E11)*($G$42>=$F11),$H11*($G$41<=$F11)*($G$42>=$E11))
AV11: @IF($A11=1,$H11*($G$42<=$E11)*($G$43>=$F11),$H11*($G$42<=$F11)*($G$43>=$E11))
AW11: @IF($A11=1,$H11*($G$43<=$E11)*($G$44>=$F11),$H11*($G$43<=$F11)*($G$44>=$E11))
AX11: @IF($A11=1,$H11*($G$44<=$E11)*($G$45>=$F11),$H11*($G$44<=$F11)*($G$45>=$E11))
      @IF($A11=1,$H11*($G$45<=$E11)*($G$46>=$F11),$H11*($G$45<=$F11)*($G$46>=$E11))
AZ11: @IF($A11=1,$H11*($G$46<=$E11)*($G$47>=$F11),$H11*($G$46<=$F11)*($G$47>=$E11))
BA11: @IF($A11=1,$H11*($G$47<=$E11)*($G$48>=$F11),$H11*($G$47<=$F11)*($G$48>=$E11))
BB11: @IF($A11=1,$H11*($G$48<=$E11)*($G$49>=$F11),$H11*($G$48<=$F11)*($G$49>=$E11))
BC11: @IF($A11=1,$H11*($G$49<=$E11)*($G$50>=$F11),$H11*($G$49<=$F11)*($G$50>=$E11))
BD11: @IF($A11=1,$H11*($G$50<=$E11)*($G$51>=$F11),$H11*($G$50<=$F11)*($G$51>=$E11))
BE11: @IF($A11=1,$H11*($G$51<=$E11)*($G$52>=$F11),$H11*($G$51<=$F11)*($G$52>=$E11))
BF11: @IF($A11=1,$H11*($G$52<=$E11)*($G$53>=$F11),$H11*($G$52<=$F11)*($G$53>=$E11))
BG11: @IF($A11=1,$H11*($G$53<=$E11)*($G$54>=$F11),$H11*($G$53<=$F11)*($G$54>=$E11))
BH11: @IF($A11=1,$H11*($G$54<=$E11)*($G$55>=$F11),$H11*($G$54<=$F11)*($G$55>=$E11))
BI11: @IF($A11=1,$H11*($G$55<=$E11)*($G$56>=$F11),$H11*($G$55<=$F11)*($G$56>=$E11))
BJ11: @IF($A11=1,$H11*($G$56<=$E11)*($G$57>=$F11),$H11*($G$56<=$F11)*($G$57>=$E11))
BK11: @IF($A11=1,$H11*($G$57<=$E11)*($G$58>=$F11),$H11*($G$57<=$F11)*($G$58>=$E11))
BL11: @IF($A11=1,$H11*($G$58<=$E11)*($G$59>=$F11),$H11*($G$58<=$F11)*($G$59>=$E11))
BM11: @IF($A11=1,$H11*($G$59<=$E11)*($G$60>=$F11),$H11*($G$59<=$F11)*($G$60>=$E11))
BN11: @IF($A11=1,$H11*($G$60<=$E11)*($G$61>=$F11),$H11*($G$60<=$F11)*($G$61>=$E11))
BO11: @IF($A11=1,$H11*($G$61<=$E11)*($G$62>=$F11),$H11*($G$61<=$F11)*($G$62>=$E11))
BP11: @IF($A11=1,$H11*($G$62<=$E11)*($G$63>=$F11),$H11*($G$62<=$F11)*($G$63>=$E11))
BQ11: @IF($A11=1,$H11*($G$63<=$E11)*($G$64>=$F11),$H11*($G$63<=$F11)*($G$64>=$E11))
BR11: @IF($A11=1,$H11*($G$64<=$E11)*($G$65>=$F11),$H11*($G$64<=$F11)*($G$65>=$E11))
BS11: @IF($A11=1,$H11*($G$65<=$E11)*($G$66>=$F11),$H11*($G$65<=$F11)*($G$66>=$E11))
BT11: @IF($A11=1,$H11*($G$66<=$E11)*($G$67>=$F11),$H11*($G$66<=$F11)*($G$67>=$E11))
BU11: @IF($A11=1,$H11*($G$67<=$E11)*($G$68>=$F11),$H11*($G$67<=$F11)*($G$68>=$E11))
BV11: @IF($A11=1,$H11*($G$68<=$E11)*($G$69>=$F11),$H11*($G$68<=$F11)*($G$69>=$E11))
BW11: @IF($A11=1,$H11*($G$69<=$E11)*($G$70>=$F11),$H11*($G$69<=$F11)*($G$70>=$E11))
BX11: @IF($A11=1,$H11*($G$70<=$E11)*($G$71>=$F11),$H11*($G$70<=$F11)*($G$71>=$E11))
BY11: @IF($A11=1,$H11*($G$71<=$E11)*($G$72>=$F11),$H11*($G$71<=$F11)*($G$72>=$E11))
BZ11: @IF($A11=1,$H11*($G$72<=$E11)*($G$73>=$F11),$H11*($G$72<=$F11)*($G$73>=$E11))
P12: @IF($A12=1,$H12*($G$10<=$E12)*($G$11>=$F12),$H12*($G$10<=$F12)*($G$11>=$E12))
Q12: @IF($A12=1,$H12*($G$11<=$E12)*($G$12>=$F12),$H12*($G$11<=$F12)*($G$12>=$E12))
R12: @IF($A12=1,$H12*($G$12<=$E12)*($G$13>=$F12),$H12*($G$12<=$F12)*($G$13>=$E12))
S12: @IF($A12=1,$H12*($G$13<=$E12)*($G$14>=$F12),$H12*($G$13<=$F12)*($G$14>=$E12))
```

```
T12: @IF($A12=1,$H12*($G$14<=$E12)*($G$15>=$F12),$H12*($G$14<=$F12)*($G$15>=$E12))
U12: @IF($A12=1,$H12*($G$15<=$E12)*($G$16>=$F12),$H12*($G$15<=$F12)*($G$16>=$E12))
V12: @IF($A12=1,$H12*($G$16<=$E12)*($G$17>=$F12),$H12*($G$16<=$F12)*($G$17>=$E12))
W12: @IF($A12=1,$H12*($G$17<=$E12)*($G$18>=$F12),$H12*($G$17<=$F12)*($G$18>=$E12))
X12: @IF($A12=1,$H12*($G$18<=$E12)*($G$19>=$F12),$H12*($G$18<=$F12)*($G$19>=$E12))
Y12: @IF($A12=1,$H12*($G$19<=$E12)*($G$20>=$F12),$H12*($G$19<=$F12)*($G$20>=$E12))
Z12: @IF($A12=1,$H12*($G$20<=$E12)*($G$21>=$F12),$H12*($G$20<=$F12)*($G$21>=$E12))
AA12: @IF($A12=1,$H12*($G$21<=$E12)*($G$22>=$F12),$H12*($G$21<=$F12)*($G$22>=$E12))
AB12: @IF($A12=1,$H12*($G$22<=$E12)*($G$23>=$F12),$H12*($G$22<=$F12)*($G$23>=$E12))
AC12: @IF($A12=1,$H12*($G$23<=$E12)*($G$24>=$F12),$H12*($G$23<=$F12)*($G$24>=$E12))
AD12: @IF($A12=1,$H12*($G$24<=$E12)*($G$25>=$F12),$H12*($G$24<=$F12)*($G$25>=$E12))
AE12: @IF($A12=1,$H12*($G$25<=$E12)*($G$26>=$F12),$H12*($G$25<=$F12)*($G$26>=$E12))
AF12: @IF($A12=1,$H12*($G$26<=$E12)*($G$27>=$F12),$H12*($G$26<=$F12)*($G$27>=$E12))
AG12: @IF($A12=1,$H12*($G$27<=$E12)*($G$28>=$F12),$H12*($G$27<=$F12)*($G$28>=$E12))
AH12: @IF($A12=1,$H12*($G$28<=$E12)*($G$29>=$F12),$H12*($G$28<=$F12)*($G$29>=$E12))
AI12: @IF($A12=1,$H12*($G$29<=$E12)*($G$30>=$F12),$H12*($G$29<=$F12)*($G$30>=$E12))
AJ12: @IF($A12=1,$H12*($G$30<=$E12)*($G$31>=$F12),$H12*($G$30<=$F12)*($G$31>=$E12))
AK12: @IF($A12=1,$H12*($G$31<=$E12)*($G$32>=$F12),$H12*($G$31<=$F12)*($G$32>=$E12))
AL12: @IF($A12=1,$H12*($G$32<=$E12)*($G$33>=$F12),$H12*($G$32<=$F12)*($G$33>=$E12))
AM12: @IF($A12=1,$H12*($G$33<=$E12)*($G$34>=$F12),$H12*($G$33<=$F12)*($G$34>=$E12))
AN12: @IF($A12=1,$H12*($G$34<=$E12)*($G$35>=$F12),$H12*($G$34<=$F12)*($G$35>=$E12))
AO12: @IF($A12=1,$H12*($G$35<=$E12)*($G$36>=$F12),$H12*($G$35<=$F12)*($G$36>=$E12))
AP12: @IF($A12=1,$H12*($G$36<=$E12)*($G$37>=$F12),$H12*($G$36<=$F12)*($G$37>=$E12))
AQ12: @IF($A12=1,$H12*($G$37<=$E12)*($G$38>=$F12),$H12*($G$37<=$F12)*($G$38>=$E12))
AR12: @IF($A12=1,$H12*($G$38<=$E12)*($G$39>=$F12),$H12*($G$38<=$F12)*($G$39>=$E12))
AS12: @IF($A12=1,$H12*($G$39<=$E12)*($G$40>=$F12),$H12*($G$39<=$F12)*($G$40>=$E12))
AT12: @IF($A12=1,$H12*($G$40<=$E12)*($G$41>=$F12),$H12*($G$40<=$F12)*($G$41>=$E12))
AU12: @IF($A12=1,$H12*($G$41<=$E12)*($G$42>=$F12),$H12*($G$41<=$F12)*($G$42>=$E12))
AV12: @IF($A12=1,$H12*($G$42<=$E12)*($G$43>=$F12),$H12*($G$42<=$F12)*($G$43>=$E12))
AW12: @IF($A12=1,$H12*($G$43<=$E12)*($G$44>=$F12),$H12*($G$43<=$F12)*($G$44>=$E12))
AX12: @IF($A12=1,$H12*($G$44<=$E12)*($G$45>=$F12),$H12*($G$44<=$F12)*($G$45>=$E12))
AY12: @IF($A12=1,$H12*($G$45<=$E12)*($G$46>=$F12),$H12*($G$45<=$F12)*($G$46>=$E12))
AZ12: @IF($A12=1,$H12*($G$46<=$E12)*($G$47>=$F12),$H12*($G$46<=$F12)*($G$47>=$E12))
BA12: @IF($A12=1,$H12*($G$47<=$E12)*($G$48>=$F12),$H12*($G$47<=$F12)*($G$48>=$E12))
BB12: @IF($A12=1,$H12*($G$48<=$E12)*($G$49>=$F12),$H12*($G$48<=$F12)*($G$49>=$E12))
BC12: @IF($A12=1,$H12*($G$49<=$E12)*($G$50>=$F12),$H12*($G$49<=$F12)*($G$50>=$E12))
BD12: @IF($A12=1,$H12*($G$50<=$E12)*($G$51>=$F12),$H12*($G$50<=$F12)*($G$51>=$E12))
BE12: @IF($A12=1,$H12*($G$51<=$E12)*($G$52>=$F12),$H12*($G$51<=$F12)*($G$52>=$E12))
BF12: @IF($A12=1,$H12*($G$52<=$E12)*($G$53>=$F12),$H12*($G$52<=$F12)*($G$53>=$E12))
BG12: @IF($A12=1,$H12*($G$53<=$E12)*($G$54>=$F12),$H12*($G$53<=$F12)*($G$54>=$E12))
BH12: @IF($A12=1,$H12*($G$54<=$E12)*($G$55>=$F12),$H12*($G$54<=$F12)*($G$55>=$E12))
BI12: @IF($A12=1,$H12*($G$55<=$E12)*($G$56>=$F12),$H12*($G$55<=$F12)*($G$56>=$E12))
BJ12: @IF($A12=1,$H12*($G$56<=$E12)*($G$57>=$F12),$H12*($G$56<=$F12)*($G$57>=$E12))
BK12: @IF($A12=1,$H12*($G$57<=$E12)*($G$58>=$F12),$H12*($G$57<=$F12)*($G$58>=$E12))
BL12: @IF($A12=1,$H12*($G$58<=$E12)*($G$59>=$F12),$H12*($G$58<=$F12)*($G$59>=$E12))
BM12: @IF($A12=1,$H12*($G$59<=$E12)*($G$60>=$F12),$H12*($G$59<=$F12)*($G$60>=$E12))
BN12: @IF($A12=1,$H12*($G$60<=$E12)*($G$61>=$F12),$H12*($G$60<=$F12)*($G$61>=$E12))
BO12: @IF($A12=1,$H12*($G$61<=$E12)*($G$62>=$F12),$H12*($G$61<=$F12)*($G$62>=$E12))
BP12: @IF($A12=1,$H12*($G$62<=$E12)*($G$63>=$F12),$H12*($G$62<=$F12)*($G$63>=$E12))
BQ12: @IF($A12=1,$H12*($G$63<=$E12)*($G$64>=$F12),$H12*($G$63<=$F12)*($G$64>=$E12))
BR12: @IF($A12=1,$H12*($G$64<=$E12)*($G$65>=$F12),$H12*($G$64<=$F12)*($G$65>=$E12))
BS12: @IF($A12=1,$H12*($G$65<=$E12)*($G$66>=$F12),$H12*($G$65<=$F12)*($G$66>=$E12))
BT12: @IF($A12=1,$H12*($G$66<=$E12)*($G$67>=$F12),$H12*($G$66<=$F12)*($G$67>=$E12))
BU12: @IF($A12=1,$H12*($G$67<=$E12)*($G$68>=$F12),$H12*($G$67<=$F12)*($G$68>=$E12))
BV12: @IF($A12=1,$H12*($G$68<=$E12)*($G$69>=$F12),$H12*($G$68<=$F12)*($G$69>=$E12))
BW12: @IF($A12=1,$H12*($G$69<=$E12)*($G$70>=$F12),$H12*($G$69<=$F12)*($G$70>=$E12))
```

```
BX12: @IF($A12=1,$H12*($G$70<=$E12)*($G$71>=$F12),$H12*($G$70<=$F12)*($G$71>=$E12))
BY12: @IF($A12=1,$H12*($G$71<=$E12)*($G$72>=$F12),$H12*($G$71<=$F12)*($G$72>=$E12))
BZ12: @IF($A12=1,$H12*($G$72<=$E12)*($G$73>=$F12),$H12*($G$72<=$F12)*($G$73>=$E12))
P13: @IF($A13=1,$H13*($G$10<=$E13)*($G$11>=$F13),$H13*($G$10<=$F13)*($G$11>=$E13))
Q13: @IF($A13=1,$H13*($G$11<=$E13)*($G$12>=$F13),$H13*($G$11<=$F13)*($G$12>=$E13))
R13: @IF($A13=1,$H13*($G$12<=$E13)*($G$13>=$F13),$H13*($G$12<=$F13)*($G$13>=$E13))
S13: @IF($A13=1,$H13*($G$13<=$E13)*($G$14>=$F13),$H13*($G$13<=$F13)*($G$14>=$E13))
T13: @IF($A13=1,$H13*($G$14<=$E13)*($G$15>=$F13),$H13*($G$14<=$F13)*($G$15>=$E13))
U13: @IF($A13=1,$H13*($G$15<=$E13)*($G$16>=$F13),$H13*($G$15<=$F13)*($G$16>=$E13))
V13: @IF($A13=1,$H13*($G$16<=$E13)*($G$17>=$F13),$H13*($G$16<=$F13)*($G$17>=$E13))
W13: @IF($A13=1,$H13*($G$17<=$E13)*($G$18>=$F13),$H13*($G$17<=$F13)*($G$18>=$E13))
X13: @IF($A13=1,$H13*($G$18<=$E13)*($G$19>=$F13),$H13*($G$18<=$F13)*($G$19>=$E13))
Y13: @IF($A13=1,$H13*($G$19<=$E13)*($G$20>=$F13),$H13*($G$19<=$F13)*($G$20>=$E13))
Z13: @IF($A13=1,$H13*($G$20<=$E13)*($G$21>=$F13),$H13*($G$20<=$F13)*($G$21>=$E13))
AA13: @IF($A13=1,$H13*($G$21<=$E13)*($G$22>=$F13),$H13*($G$21<=$F13)*($G$22>=$E13))
AB13: @IF($A13=1,$H13*($G$22<=$E13)*($G$23>=$F13),$H13*($G$22<=$F13)*($G$23>=$E13))
AC13: @IF($A13=1,$H13*($G$23<=$E13)*($G$24>=$F13),$H13*($G$23<=$F13)*($G$24>=$E13))
AD13: @IF($A13=1,$H13*($G$24<=$E13)*($G$25>=$F13),$H13*($G$24<=$F13)*($G$25>=$E13))
AE13: @IF($A13=1,$H13*($G$25<=$E13)*($G$26>=$F13),$H13*($G$25<=$F13)*($G$26>=$E13))
AF13: @IF($A13=1,$H13*($G$26<=$E13)*($G$27>=$F13),$H13*($G$26<=$F13)*($G$27>=$E13))
AG13: @IF($A13=1,$H13*($G$27<=$E13)*($G$28>=$F13),$H13*($G$27<=$F13)*($G$28>=$E13))
AH13: @IF($A13=1,$H13*($G$28<=$E13)*($G$29>=$F13),$H13*($G$28<=$F13)*($G$29>=$E13))
AI13: @IF($A13=1,$H13*($G$29<=$E13)*($G$30>=$F13),$H13*($G$29<=$F13)*($G$30>=$E13))
AJ13: @IF($A13=1,$H13*($G$30<=$E13)*($G$31>=$F13),$H13*($G$30<=$F13)*($G$31>=$E13))
AK13: @IF($A13=1,$H13*($G$31<=$E13)*($G$32>=$F13),$H13*($G$31<=$F13)*($G$32>=$E13))
AL13: @IF($A13=1,$H13*($G$32<=$E13)*($G$33>=$F13),$H13*($G$32<=$F13)*($G$33>=$E13))
AM13: @IF($A13=1,$H13*($G$33<=$E13)*($G$34>=$F13),$H13*($G$33<=$F13)*($G$34>=$E13))
AN13: @IF($A13=1,$H13*($G$34<=$E13)*($G$35>=$F13),$H13*($G$34<=$F13)*($G$35>=$E13))
AO13: @IF($A13=1,$H13*($G$35<=$E13)*($G$36>=$F13),$H13*($G$35<=$F13)*($G$36>=$E13))
AP13: @IF($A13=1,$H13*($G$36<=$E13)*($G$37>=$F13),$H13*($G$36<=$F13)*($G$37>=$E13))
AQ13: @IF($A13=1,$H13*($G$37<=$E13)*($G$38>=$F13),$H13*($G$37<=$F13)*($G$38>=$E13))
AR13: @IF($A13=1,$H13*($G$38<=$E13)*($G$39>=$F13),$H13*($G$38<=$F13)*($G$39>=$E13))
AS13: @IF($A13=1,$H13*($G$39<=$E13)*($G$40>=$F13),$H13*($G$39<=$F13)*($G$40>=$E13))
AT13: @IF($A13=1,$H13*($G$40<=$E13)*($G$41>=$F13),$H13*($G$40<=$F13)*($G$41>=$E13))
AU13: @IF($A13=1,$H13*($G$41<=$E13)*($G$42>=$F13),$H13*($G$41<=$F13)*($G$42>=$E13))
AV13: @IF($A13=1,$H13*($G$42<=$E13)*($G$43>=$F13),$H13*($G$42<=$F13)*($G$43>=$E13))
AW13: @IF($A13=1,$H13*($G$43<=$E13)*($G$44>=$F13),$H13*($G$43<=$F13)*($G$44>=$E13))
AX13: @IF($A13=1,$H13*($G$44<=$E13)*($G$45>=$F13),$H13*($G$44<=$F13)*($G$45>=$E13))
AY13: @IF($A13=1,$H13*($G$45<=$E13)*($G$46>=$F13),$H13*($G$45<=$F13)*($G$46>=$E13))
AZ13: @IF($A13=1,$H13*($G$46<=$E13)*($G$47>=$F13),$H13*($G$46<=$F13)*($G$47>=$E13))
BA13: @IF($A13=1,$H13*($G$47<=$E13)*($G$48>=$F13),$H13*($G$47<=$F13)*($G$48>=$E13))
BB13: @IF($A13=1,$H13*($G$48<=$E13)*($G$49>=$F13),$H13*($G$48<=$F13)*($G$49>=$E13))
BC13: @IF($A13=1,$H13*($G$49<=$E13)*($G$50>=$F13),$H13*($G$49<=$F13)*($G$50>=$E13))
BD13: @IF($A13=1,$H13*($G$50<=$E13)*($G$51>=$F13),$H13*($G$50<=$F13)*($G$51>=$E13))
BE13: @IF($A13=1,$H13*($G$51<=$E13)*($G$52>=$F13),$H13*($G$51<=$F13)*($G$52>=$E13))
BF13: @IF($A13=1,$H13*($G$52<=$E13)*($G$53>=$F13),$H13*($G$52<=$F13)*($G$53>=$E13))
BG13: @IF($A13=1,$H13*($G$53<=$E13)*($G$54>=$F13),$H13*($G$53<=$F13)*($G$54>=$E13))
BH13: @IF($A13=1,$H13*($G$54<=$E13)*($G$55>=$F13),$H13*($G$54<=$F13)*($G$55>=$E13))
BI13: @IF($A13=1,$H13*($G$55<=$E13)*($G$56>=$F13),$H13*($G$55<=$F13)*($G$56>=$E13))
BJ13: @IF($A13=1,$H13*($G$56<=$E13)*($G$57>=$F13),$H13*($G$56<=$F13)*($G$57>=$E13))
BK13: @IF($A13=1,$H13*($G$57<=$E13)*($G$58>=$F13),$H13*($G$57<=$F13)*($G$58>=$E13))
BL13: @IF($A13=1,$H13*($G$58<=$E13)*($G$59>=$F13),$H13*($G$58<=$F13)*($G$59>=$E13))
BM13: @IF($A13=1,$H13*($G$59<=$E13)*($G$60>=$F13),$H13*($G$59<=$F13)*($G$60>=$E13))
BN13: @IF($A13=1,$H13*($G$60<=$E13)*($G$61>=$F13),$H13*($G$60<=$F13)*($G$61>=$E13))
BO13: @IF($A13=1,$H13*($G$61<=$E13)*($G$62>=$F13),$H13*($G$61<=$F13)*($G$62>=$E13))
BP13: @IF($A13=1,$H13*($G$62<=$E13)*($G$63>=$F13),$H13*($G$62<=$F13)*($G$63>=$E13))
```

```
BQ13: @IF($A13=1,$H13*($G$63<=$E13)*($G$64>=$F13),$H13*($G$63<=$F13)*($G$64>=$E13))
BR13: @IF($A13=1,$H13*($G$64<=$E13)*($G$65>=$F13),$H13*($G$64<=$F13)*($G$65>=$E13))
BS13: @IF($A13=1,$H13*($G$65<=$E13)*($G$66>=$F13),$H13*($G$65<=$F13)*($G$66>=$E13))
BT13: @IF($A13=1,$H13*($G$66<=$E13)*($G$67>=$F13),$H13*($G$66<=$F13)*($G$67>=$E13))
BU13: @IF($A13=1,$H13*($G$67<=$E13)*($G$68>=$F13),$H13*($G$67<=$F13)*($G$68>=$E13))
BV13: @IF($A13=1,$H13*($G$68<=$E13)*($G$69>=$F13),$H13*($G$68<=$F13)*($G$69>=$E13))
BW13: @IF($A13=1,$H13*($G$69<=$E13)*($G$70>=$F13),$H13*($G$69<=$F13)*($G$70>=$E13))
BX13: @IF($A13=1,$H13*($G$70<=$E13)*($G$71>=$F13),$H13*($G$70<=$F13)*($G$71>=$E13))
BY13: @IF($A13=1,$H13*($G$71<=$E13)*($G$72>=$F13),$H13*($G$71<=$F13)*($G$72>=$E13))
BZ13: @IF($A13=1,$H13*($G$72<=$E13)*($G$73>=$F13),$H13*($G$72<=$F13)*($G$73>=$E13))
P14: @IF($A14=1,$H14*($G$10<=$E14)*($G$11>=$F14),$H14*($G$10<=$F14)*($G$11>=$E14))
Q14: @IF($A14=1,$H14*($G$11<=$E14)*($G$12>=$F14),$H14*($G$11<=$F14)*($G$12>=$E14))
R14: @IF($A14=1,$H14*($G$12<=$E14)*($G$13>=$F14),$H14*($G$12<=$F14)*($G$13>=$E14))
S14: @IF($A14=1,$H14*($G$13<=$E14)*($G$14>=$F14),$H14*($G$13<=$F14)*($G$14>=$E14))
T14: @IF($A14=1,$H14*($G$14<=$E14)*($G$15>=$F14),$H14*($G$14<=$F14)*($G$15>=$E14))
U14: @IF($A14=1,$H14*($G$15<=$E14)*($G$16>=$F14),$H14*($G$15<=$F14)*($G$16>=$E14))
V14: @IF($A14=1,$H14*($G$16<=$E14)*($G$17>=$F14),$H14*($G$16<=$F14)*($G$17>=$E14))
W14: @IF($A14=1,$H14*($G$17<=$E14)*($G$18>=$F14),$H14*($G$17<=$F14)*($G$18>=$E14))
X14: @IF($A14=1,$H14*($G$18<=$E14)*($G$19>=$F14),$H14*($G$18<=$F14)*($G$19>=$E14))
Y14: @IF($A14=1,$H14*($G$19<=$E14)*($G$20>=$F14),$H14*($G$19<=$F14)*($G$20>=$E14))
Z14: @IF($A14=1,$H14*($G$20<=$E14)*($G$21>=$F14),$H14*($G$20<=$F14)*($G$21>=$E14))
AA14: @IF($A14=1,$H14*($G$21<=$E14)*($G$22>=$F14),$H14*($G$21<=$F14)*($G$22>=$E14))
AB14: @IF($A14=1,$H14*($G$22<=$E14)*($G$23>=$F14),$H14*($G$22<=$F14)*($G$23>=$E14))
AC14: @IF($A14=1,$H14*($G$23<=$E14)*($G$24>=$F14),$H14*($G$23<=$F14)*($G$24>=$E14))
AD14: @IF($A14=1,$H14*($G$24<=$E14)*($G$25>=$F14),$H14*($G$24<=$F14)*($G$25>=$E14))
AE14: @IF($A14=1,$H14*($G$25<=$E14)*($G$26>=$F14),$H14*($G$25<=$F14)*($G$26>=$E14))
AF14: @IF($A14=1,$H14*($G$26<=$E14)*($G$27>=$F14),$H14*($G$26<=$F14)*($G$27>=$E14))
AG14: @IF($A14=1,$H14*($G$27<=$E14)*($G$28>=$F14),$H14*($G$27<=$F14)*($G$28>=$E14))
AH14: @IF($A14=1,$H14*($G$28<=$E14)*($G$29>=$F14),$H14*($G$28<=$F14)*($G$29>=$E14))
AI14: @IF($A14=1,$H14*($G$29<=$E14)*($G$30>=$F14),$H14*($G$29<=$F14)*($G$30>=$E14))
AJ14: @IF($A14=1,$H14*($G$30<=$E14)*($G$31>=$F14),$H14*($G$30<=$F14)*($G$31>=$E14))
AK14: @IF($A14=1,$H14*($G$31<=$E14)*($G$32>=$F14),$H14*($G$31<=$F14)*($G$32>=$E14))
AL14: @IF($A14=1,$H14*($G$32<=$E14)*($G$33>=$F14),$H14*($G$32<=$F14)*($G$33>=$E14))
AM14: @IF($A14=1,$H14*($G$33<=$E14)*($G$34>=$F14),$H14*($G$33<=$F14)*($G$34>=$E14))
AN14: @IF($A14=1,$H14*($G$34<=$E14)*($G$35>=$F14),$H14*($G$34<=$F14)*($G$35>=$E14))
AO14: @IF($A14=1,$H14*($G$35<=$E14)*($G$36>=$F14),$H14*($G$35<=$F14)*($G$36>=$E14))
AP14: @IF($A14=1,$H14*($G$36<=$E14)*($G$37>=$F14),$H14*($G$36<=$F14)*($G$37>=$E14))
AQ14: @IF($A14=1,$H14*($G$37<=$E14)*($G$38>=$F14),$H14*($G$37<=$F14)*($G$38>=$E14))
AR14: @IF($A14=1,$H14*($G$38<=$E14)*($G$39>=$F14),$H14*($G$38<=$F14)*($G$39>=$E14))
AS14: @IF($A14=1,$H14*($G$39<=$E14)*($G$40>=$F14),$H14*($G$39<=$F14)*($G$40>=$E14))
AT14: @IF($A14=1,$H14*($G$40<=$E14)*($G$41>=$F14),$H14*($G$40<=$F14)*($G$41>=$E14))
AU14: @IF($A14=1,$H14*($G$41<=$E14)*($G$42>=$F14),$H14*($G$41<=$F14)*($G$42>=$E14))
AV14: @IF($A14=1,$H14*($G$42<=$E14)*($G$43>=$F14),$H14*($G$42<=$F14)*($G$43>=$E14))
AW14: @IF($A14=1,$H14*($G$43<=$E14)*($G$44>=$F14),$H14*($G$43<=$F14)*($G$44>=$E14))
AX14: @IF($A14=1,$H14*($G$44<=$E14)*($G$45>=$F14),$H14*($G$44<=$F14)*($G$45>=$E14))
AY14: @IF($A14=1,$H14*($G$45<=$E14)*($G$46>=$F14),$H14*($G$45<=$F14)*($G$46>=$E14))
AZ14: @IF($A14=1,$H14*($G$46<=$E14)*($G$47>=$F14),$H14*($G$46<=$F14)*($G$47>=$E14))
BA14: @IF($A14=1,$H14*($G$47<=$E14)*($G$48>=$F14),$H14*($G$47<=$F14)*($G$48>=$E14))
BB14: @IF($A14=1,$H14*($G$48<=$E14)*($G$49>=$F14),$H14*($G$48<=$F14)*($G$49>=$E14))
BC14: @IF($A14=1,$H14*($G$49<=$E14)*($G$50>=$F14),$H14*($G$49<=$F14)*($G$50>=$E14))
BD14: @IF($A14=1,$H14*($G$50<=$E14)*($G$51>=$F14),$H14*($G$50<=$F14)*($G$51>=$E14))
BE14: @IF($A14=1,$H14*($G$51<=$E14)*($G$52>=$F14),$H14*($G$51<=$F14)*($G$52>=$E14))
BF14: @IF($A14=1,$H14*($G$52<=$E14)*($G$53>=$F14),$H14*($G$52<=$F14)*($G$53>=$E14))
BG14: @IF($A14=1,$H14*($G$53<=$E14)*($G$54>=$F14),$H14*($G$53<=$F14)*($G$54>=$E14))
BH14: @IF($A14=1,$H14*($G$54<=$E14)*($G$55>=$F14),$H14*($G$54<=$F14)*($G$55>=$E14))
BI14: @IF($A14=1,$H14*($G$55<=$E14)*($G$56>=$F14),$H14*($G$55<=$F14)*($G$56>=$E14))
```

```
BJ14: @IF($A14=1,$H14*($G$56<=$E14)*($G$57>=$F14),$H14*($G$56<=$F14)*($G$57>=$E14))
BK14: @IF($A14=1,$H14*($G$57<=$E14)*($G$58>=$F14),$H14*($G$57<=$F14)*($G$58>=$E14))
BL14: @IF($A14=1,$H14*($G$58<=$E14)*($G$59>=$F14),$H14*($G$58<=$F14)*($G$59>=$E14))
BM14: @IF($A14=1,$H14*($G$59<=$E14)*($G$60>=$F14),$H14*($G$59<=$F14)*($G$60>=$E14))
BN14: @IF($A14=1,$H14*($G$60<=$E14)*($G$61>=$F14),$H14*($G$60<=$F14)*($G$61>=$E14))
BO14: @IF($A14=1,$H14*($G$61<=$E14)*($G$62>=$F14),$H14*($G$61<=$F14)*($G$62>=$E14))
BP14: @IF($A14=1,$H14*($G$62<=$E14)*($G$63>=$F14),$H14*($G$62<=$F14)*($G$63>=$E14))
BQ14: @IF($A14=1,$H14*($G$63<=$E14)*($G$64>=$F14),$H14*($G$63<=$F14)*($G$64>=$E14))
BR14: @IF($A14=1,$H14*($G$64<=$E14)*($G$65>=$F14),$H14*($G$64<=$F14)*($G$65>=$E14))
BS14: @IF($A14=1,$H14*($G$65<=$E14)*($G$66>=$F14),$H14*($G$65<=$F14)*($G$66>=$E14))
BT14: @IF($A14=1,$H14*($G$66<=$E14)*($G$67>=$F14),$H14*($G$66<=$F14)*($G$67>=$E14))
BU14: @IF($A14=1,$H14*($G$67<=$E14)*($G$68>=$F14),$H14*($G$67<=$F14)*($G$68>=$E14))
BV14: @IF($A14=1,$H14*($G$68<=$E14)*($G$69>=$F14),$H14*($G$68<=$F14)*($G$69>=$E14))
BW14: @IF($A14=1,$H14*($G$69<=$E14)*($G$70>=$F14),$H14*($G$69<=$F14)*($G$70>=$E14))
BX14: @IF($A14=1,$H14*($G$70<=$E14)*($G$71>=$F14),$H14*($G$70<=$F14)*($G$71>=$E14))
BY14: @IF($A14=1,$H14*($G$71<=$E14)*($G$72>=$F14),$H14*($G$71<=$F14)*($G$72>=$E14))
BZ14: @IF($A14=1,$H14*($G$72<=$E14)*($G$73>=$F14),$H14*($G$72<=$F14)*($G$73>=$E14))
P15: @IF($A15=1,$H15*($G$10<=$E15)*($G$11>=$F15),$H15*($G$10<=$F15)*($G$11>=$E15))
Q15: @IF($A15=1,$H15*($G$11<=$E15)*($G$12>=$F15),$H15*($G$11<=$F15)*($G$12>=$E15))
R15: @IF($A15=1,$H15*($G$12<=$E15)*($G$13>=$F15),$H15*($G$12<=$F15)*($G$13>=$E15))
S15: @IF($A15=1,$H15*($G$13<=$E15)*($G$14>=$F15),$H15*($G$13<=$F15)*($G$14>=$E15))
T15: @IF($A15=1,$H15*($G$14<=$E15)*($G$15>=$F15),$H15*($G$14<=$F15)*($G$15>=$E15))
U15: @IF($A15=1,$H15*($G$15<=$E15)*($G$16>=$F15),$H15*($G$15<=$F15)*($G$16>=$E15))
V15: @IF($A15=1,$H15*($G$16<=$E15)*($G$17>=$F15),$H15*($G$16<=$F15)*($G$17>=$E15))
W15: @IF($A15=1,$H15*($G$17<=$E15)*($G$18>=$F15),$H15*($G$17<=$F15)*($G$18>=$E15))
X15: @IF($A15=1,$H15*($G$18<=$E15)*($G$19>=$F15),$H15*($G$18<=$F15)*($G$19>=$E15))
Y15: @IF($A15=1,$H15*($G$19<=$E15)*($G$20>=$F15),$H15*($G$19<=$F15)*($G$20>=$E15))
Z15: @IF($A15=1,$H15*($G$20<=$E15)*($G$21>=$F15),$H15*($G$20<=$F15)*($G$21>=$E15))
AA15: @IF($A15=1,$H15*($G$21<=$E15)*($G$22>=$F15),$H15*($G$21<=$F15)*($G$22>=$E15))
AB15: @IF($A15=1,$H15*($G$22<=$E15)*($G$23>=$F15),$H15*($G$22<=$F15)*($G$23>=$E15))
AC15: @IF($A15=1,$H15*($G$23<=$E15)*($G$24>=$F15),$H15*($G$23<=$F15)*($G$24>=$E15))
AD15: @IF($A15=1,$H15*($G$24<=$E15)*($G$25>=$F15),$H15*($G$24<=$F15)*($G$25>=$E15))
AE15: @IF($A15=1,$H15*($G$25<=$E15)*($G$26>=$F15),$H15*($G$25<=$F15)*($G$26>=$E15))
AF15: @IF($A15=1,$H15*($G$26<=$E15)*($G$27>=$F15),$H15*($G$26<=$F15)*($G$27>=$E15))
AG15: @IF($A15=1,$H15*($G$27<=$E15)*($G$28>=$F15),$H15*($G$27<=$F15)*($G$28>=$E15))
AH15: @IF($A15=1,$H15*($G$28<=$E15)*($G$29>=$F15),$H15*($G$28<=$F15)*($G$29>=$E15))
AI15: @IF($A15=1,$H15*($G$29<=$E15)*($G$30>=$F15),$H15*($G$29<=$F15)*($G$30>=$E15))
AJ15: @IF($A15=1,$H15*($G$30<=$E15)*($G$31>=$F15),$H15*($G$30<=$F15)*($G$31>=$E15))
AK15: @IF($A15=1,$H15*($G$31<=$E15)*($G$32>=$F15),$H15*($G$31<=$F15)*($G$32>=$E15))
AL15: @IF($A15=1,$H15*($G$32<=$E15)*($G$33>=$F15),$H15*($G$32<=$F15)*($G$33>=$E15))
AM15: @IF($A15=1,$H15*($G$33<=$E15)*($G$34>=$F15),$H15*($G$33<=$F15)*($G$34>=$E15))
AN15: @IF($A15=1,$H15*($G$34<=$E15)*($G$35>=$F15),$H15*($G$34<=$F15)*($G$35>=$E15))
AO15: @IF($A15=1,$H15*($G$35<=$E15)*($G$36>=$F15),$H15*($G$35<=$F15)*($G$36>=$E15))
AP15: @IF($A15=1,$H15*($G$36<=$E15)*($G$37>=$F15),$H15*($G$36<=$F15)*($G$37>=$E15))
AQ15: @IF($A15=1,$H15*($G$37<=$E15)*($G$38>=$F15),$H15*($G$37<=$F15)*($G$38>=$E15))
AR15: @IF($A15=1,$H15*($G$38<=$E15)*($G$39>=$F15),$H15*($G$38<=$F15)*($G$39>=$E15))
AS15: @IF($A15=1,$H15*($G$39<=$E15)*($G$40>=$F15),$H15*($G$39<=$F15)*($G$40>=$E15))
AT15: @IF($A15=1,$H15*($G$40<=$E15)*($G$41>=$F15),$H15*($G$40<=$F15)*($G$41>=$E15))
AU15: @IF($A15=1,$H15*($G$41<=$E15)*($G$42>=$F15),$H15*($G$41<=$F15)*($G$42>=$E15))
AV15: @IF($A15=1,$H15*($G$42<=$E15)*($G$43>=$F15),$H15*($G$42<=$F15)*($G$43>=$E15))
AW15: @IF($A15=1,$H15*($G$43<=$E15)*($G$44>=$F15),$H15*($G$43<=$F15)*($G$44>=$E15))
AX15: @IF($A15=1,$H15*($G$44<=$E15)*($G$45>=$F15),$H15*($G$44<=$F15)*($G$45>=$E15))
AY15: @IF($A15=1,$H15*($G$45<=$E15)*($G$46>=$F15),$H15*($G$45<=$F15)*($G$46>=$E15))
AZ15: @IF($A15=1,$H15*($G$46<=$E15)*($G$47>=$F15),$H15*($G$46<=$F15)*($G$47>=$E15))
BA15: @IF($A15=1,$H15*($G$47<=$E15)*($G$48>=$F15),$H15*($G$47<=$F15)*($G$48>=$E15))
BB15: @IF($A15=1,$H15*($G$48<=$E15)*($G$49>=$F15),$H15*($G$48<=$F15)*($G$49>=$E15))
```

```
BC15: @IF($A15=1,$H15*($G$49<=$E15)*($G$50>=$F15),$H15*($G$49<=$F15)*($G$50>=$E15))
BD15: @IF($A15=1,$H15*($G$50<=$E15)*($G$51>=$F15),$H15*($G$50<=$F15)*($G$51>=$E15))
BE15: @IF($A15=1,$H15*($G$51<=$E15)*($G$52>=$F15),$H15*($G$51<=$F15)*($G$52>=$E15))
BF15: @IF($A15=1,$H15*($G$52<=$E15)*($G$53>=$F15),$H15*($G$52<=$F15)*($G$53>=$E15))
BG15: @IF($A15=1,$H15*($G$53<=$E15)*($G$54>=$F15),$H15*($G$53<=$F15)*($G$54>=$E15))
BH15: @IF($A15=1,$H15*($G$54<=$E15)*($G$55>=$F15),$H15*($G$54<=$F15)*($G$55>=$E15))
BI15: @IF($A15=1,$H15*($G$55<=$E15)*($G$56>=$F15),$H15*($G$55<=$F15)*($G$56>=$E15))
BJ15: @IF($A15=1,$H15*($G$56<=$E15)*($G$57>=$F15),$H15*($G$56<=$F15)*($G$57>=$E15))
BK15: @IF($A15=1,$H15*($G$57<=$E15)*($G$58>=$F15),$H15*($G$57<=$F15)*($G$58>=$E15))
BL15: @IF($A15=1,$H15*($G$58<=$E15)*($G$59>=$F15),$H15*($G$58<=$F15)*($G$59>=$E15))
BM15: @IF($A15=1,$H15*($G$59<=$E15)*($G$60>=$F15),$H15*($G$59<=$F15)*($G$60>=$E15))
BN15: @IF($A15=1,$H15*($G$60<=$E15)*($G$61>=$F15),$H15*($G$60<=$F15)*($G$61>=$E15))
BO15: @IF($A15=1,$H15*($G$61<=$E15)*($G$62>=$F15),$H15*($G$61<=$F15)*($G$62>=$E15))
BP15: @IF($A15=1,$H15*($G$62<=$E15)*($G$63>=$F15),$H15*($G$62<=$F15)*($G$63>=$E15))
BQ15: @IF($A15=1,$H15*($G$63<=$E15)*($G$64>=$F15),$H15*($G$63<=$F15)*($G$64>=$E15))
BR15: @IF($A15=1,$H15*($G$64<=$E15)*($G$65>=$F15),$H15*($G$64<=$F15)*($G$65>=$E15))
BS15: @IF($A15=1,$H15*($G$65<=$E15)*($G$66>=$F15),$H15*($G$65<=$F15)*($G$66>=$E15))
BT15: @IF($A15=1,$H15*($G$66<=$E15)*($G$67>=$F15),$H15*($G$66<=$F15)*($G$67>=$E15))
BU15: @IF($A15=1,$H15*($G$67<=$E15)*($G$68>=$F15),$H15*($G$67<=$F15)*($G$68>=$E15))
BV15: @IF($A15=1,$H15*($G$68<=$E15)*($G$69>=$F15),$H15*($G$68<=$F15)*($G$69>=$E15))
BW15: @IF($A15=1,$H15*($G$69<=$E15)*($G$70>=$F15),$H15*($G$69<=$F15)*($G$70>=$E15))
BX15: @IF($A15=1,$H15*($G$70<=$E15)*($G$71>=$F15),$H15*($G$70<=$F15)*($G$71>=$E15))
BY15: @IF($A15=1,$H15*($G$71<=$E15)*($G$72>=$F15),$H15*($G$71<=$F15)*($G$72>=$E15))
BZ15: @IF($A15=1,$H15*($G$72<=$E15)*($G$73>=$F15),$H15*($G$72<=$F15)*($G$73>=$E15))
P16: @IF($A16=1,$H16*($G$10<=$E16)*($G$11>=$F16),$H16*($G$10<=$F16)*($G$11>=$E16))
Q16: @IF($A16=1,$H16*($G$11<=$E16)*($G$12>=$F16),$H16*($G$11<=$F16)*($G$12>=$E16))
R16: @IF($A16=1,$H16*($G$12<=$E16)*($G$13>=$F16),$H16*($G$12<=$F16)*($G$13>=$E16))
S16: @IF($A16=1,$H16*($G$13<=$E16)*($G$14>=$F16),$H16*($G$13<=$F16)*($G$14>=$E16))
T16: @IF($A16=1,$H16*($G$14<=$E16)*($G$15>=$F16),$H16*($G$14<=$F16)*($G$15>=$E16))
U16: @IF($A16=1,$H16*($G$15<=$E16)*($G$16>=$F16),$H16*($G$15<=$F16)*($G$16>=$E16))
V16: @IF($A16=1,$H16*($G$16<=$E16)*($G$17>=$F16),$H16*($G$16<=$F16)*($G$17>=$E16))
W16: @IF($A16=1,$H16*($G$17<=$E16)*($G$18>=$F16),$H16*($G$17<=$F16)*($G$18>=$E16))
X16: @IF($A16=1,$H16*($G$18<=$E16)*($G$19>=$F16),$H16*($G$18<=$F16)*($G$19>=$E16))
Y16: @IF($A16=1,$H16*($G$19<=$E16)*($G$20>=$F16),$H16*($G$19<=$F16)*($G$20>=$E16))
Z16: @IF($A16=1,$H16*($G$20<=$E16)*($G$21>=$F16),$H16*($G$20<=$F16)*($G$21>=$E16))
AA16: @IF($A16=1,$H16*($G$21<=$E16)*($G$22>=$F16),$H16*($G$21<=$F16)*($G$22>=$E16))
AB16: @IF($A16=1,$H16*($G$22<=$E16)*($G$23>=$F16),$H16*($G$22<=$F16)*($G$23>=$E16))
AC16: @IF($A16=1,$H16*($G$23<=$E16)*($G$24>=$F16),$H16*($G$23<=$F16)*($G$24>=$E16))
AD16: @IF($A16=1,$H16*($G$24<=$E16)*($G$25>=$F16),$H16*($G$24<=$F16)*($G$25>=$E16))
AE16: @IF($A16=1,$H16*($G$25<=$E16)*($G$26>=$F16),$H16*($G$25<=$F16)*($G$26>=$E16))
AF16: @IF($A16=1,$H16*($G$26<=$E16)*($G$27>=$F16),$H16*($G$26<=$F16)*($G$27>=$E16))
AG16: @IF($A16=1,$H16*($G$27<=$E16)*($G$28>=$F16),$H16*($G$27<=$F16)*($G$28>=$E16))
AH16: @IF($A16=1,$H16*($G$28<=$E16)*($G$29>=$F16),$H16*($G$28<=$F16)*($G$29>=$E16))
AI16: @IF($A16=1,$H16*($G$29<=$E16)*($G$30>=$F16),$H16*($G$29<=$F16)*($G$30>=$E16))
AJ16: @IF($A16=1,$H16*($G$30<=$E16)*($G$31>=$F16),$H16*($G$30<=$F16)*($G$31>=$E16))
AK16: @IF($A16=1,$H16*($G$31<=$E16)*($G$32>=$F16),$H16*($G$31<=$F16)*($G$32>=$E16))
AL16: @IF($A16=1,$H16*($G$32<=$E16)*($G$33>=$F16),$H16*($G$32<=$F16)*($G$33>=$E16))
AM16: @IF($A16=1,$H16*($G$33<=$E16)*($G$34>=$F16),$H16*($G$33<=$F16)*($G$34>=$E16))
AN16: @IF($A16=1,$H16*($G$34<=$E16)*($G$35>=$F16),$H16*($G$34<=$F16)*($G$35>=$E16))
AO16: @IF($A16=1,$H16*($G$35<=$E16)*($G$36>=$F16),$H16*($G$35<=$F16)*($G$36>=$E16))
AP16: @IF($A16=1,$H16*($G$36<=$E16)*($G$37>=$F16),$H16*($G$36<=$F16)*($G$37>=$E16))
AQ16: @IF($A16=1,$H16*($G$37<=$E16)*($G$38>=$F16),$H16*($G$37<=$F16)*($G$38>=$E16))
AR16: @IF($A16=1,$H16*($G$38<=$E16)*($G$39>=$F16),$H16*($G$38<=$F16)*($G$39>=$E16))
AS16: @IF($A16=1,$H16*($G$39<=$E16)*($G$40>=$F16),$H16*($G$39<=$F16)*($G$40>=$E16))
AT16: @IF($A16=1,$H16*($G$40<=$E16)*($G$41>=$F16),$H16*($G$40<=$F16)*($G$41>=$E16))
AU16: @IF($A16=1,$H16*($G$41<=$E16)*($G$42>=$F16),$H16*($G$41<=$F16)*($G$42>=$E16))
```

```
AV16: @IF($A16=1,$H16*($G$42<=$E16)*($G$43>=$F16),$H16*($G$42<=$F16)*($G$43>=$E16))
AW16: @IF($A16=1,$H16*($G$43<=$E16)*($G$44>=$F16),$H16*($G$43<=$F16)*($G$44>=$E16))
AX16: @IF($A16=1,$H16*($G$44<=$E16)*($G$45>=$F16),$H16*($G$44<=$F16)*($G$45>=$E16))
AY16: @IF($A16=1,$H16*($G$45<=$E16)*($G$46>=$F16),$H16*($G$45<=$F16)*($G$46>=$E16))
AZ16: @IF($A16=1,$H16*($G$46<=$E16)*($G$47>=$F16),$H16*($G$46<=$F16)*($G$47>=$E16))
BA16: @IF($A16=1,$H16*($G$47<=$E16)*($G$48>=$F16),$H16*($G$47<=$F16)*($G$48>=$E16))
BB16: @IF($A16=1,$H16*($G$48<=$E16)*($G$49>=$F16),$H16*($G$48<=$F16)*($G$49>=$E16))
BC16: @IF($A16=1,$H16*($G$49<=$E16)*($G$50>=$F16),$H16*($G$49<=$F16)*($G$50>=$E16))
BD16: @IF($A16=1,$H16*($G$50<=$E16)*($G$51>=$F16),$H16*($G$50<=$F16)*($G$51>=$E16))
BE16: @IF($A16=1,$H16*($G$51<=$E16)*($G$52>=$F16),$H16*($G$51<=$F16)*($G$52>=$E16))
BF16: @IF($A16=1,$H16*($G$52<=$E16)*($G$53>=$F16),$H16*($G$52<=$F16)*($G$53>=$E16))
BG16: @IF($A16=1,$H16*($G$53<=$E16)*($G$54>=$F16),$H16*($G$53<=$F16)*($G$54>=$E16))
BH16: @IF($A16=1,$H16*($G$54<=$E16)*($G$55>=$F16),$H16*($G$54<=$F16)*($G$55>=$E16))
BI16: @IF($A16=1,$H16*($G$55<=$E16)*($G$56>=$F16),$H16*($G$55<=$F16)*($G$56>=$E16))
BJ16: @IF($A16=1,$H16*($G$56<=$E16)*($G$57>=$F16),$H16*($G$56<=$F16)*($G$57>=$E16))
BK16: @IF($A16=1,$H16*($G$57<=$E16)*($G$58>=$F16),$H16*($G$57<=$F16)*($G$58>=$E16))
BL16: @IF($A16=1,$H16*($G$58<=$E16)*($G$59>=$F16),$H16*($G$58<=$F16)*($G$59>=$E16))
BM16: @IF($A16=1,$H16*($G$59<=$E16)*($G$60>=$F16),$H16*($G$59<=$F16)*($G$60>=$E16))
BN16: @IF($A16=1,$H16*($G$60<=$E16)*($G$61>=$F16),$H16*($G$60<=$F16)*($G$61>=$E16))
BO16: @IF($A16=1,$H16*($G$61<=$E16)*($G$62>=$F16),$H16*($G$61<=$F16)*($G$62>=$E16))
BP16: @IF($A16=1,$H16*($G$62<=$E16)*($G$63>=$F16),$H16*($G$62<=$F16)*($G$63>=$E16))
BQ16: @IF($A16=1,$H16*($G$63<=$E16)*($G$64>=$F16),$H16*($G$63<=$F16)*($G$64>=$E16))
BR16: @IF($A16=1,$H16*($G$64<=$E16)*($G$65>=$F16),$H16*($G$64<=$F16)*($G$65>=$E16))
BS16: @IF($A16=1,$H16*($G$65<=$E16)*($G$66>=$F16),$H16*($G$65<=$F16)*($G$66>=$E16))
BT16: @IF($A16=1,$H16*($G$66<=$E16)*($G$67>=$F16),$H16*($G$66<=$F16)*($G$67>=$E16))
BU16: @IF($A16=1,$H16*($G$67<=$E16)*($G$68>=$F16),$H16*($G$67<=$F16)*($G$68>=$E16))
BV16: @IF($A16=1,$H16*($G$68<=$E16)*($G$69>=$F16),$H16*($G$68<=$F16)*($G$69>=$E16))
BW16: @IF($A16=1,$H16*($G$69<=$E16)*($G$70>=$F16),$H16*($G$69<=$F16)*($G$70>=$E16))
BX16: @IF($A16=1,$H16*($G$70<=$E16)*($G$71>=$F16),$H16*($G$70<=$F16)*($G$71>=$E16))
BY16: @IF($A16=1,$H16*($G$71<=$E16)*($G$72>=$F16),$H16*($G$71<=$F16)*($G$72>=$E16))
BZ16: @IF($A16=1,$H16*($G$72<=$E16)*($G$73>=$F16),$H16*($G$72<=$F16)*($G$73>=$E16))
P17: @IF($A17=1,$H17*($G$10<=$E17)*($G$11>=$F17),$H17*($G$10<=$F17)*($G$11>=$E17))
Q17: @IF($A17=1,$H17*($G$11<=$E17)*($G$12>=$F17),$H17*($G$11<=$F17)*($G$12>=$E17))
R17: @IF($A17=1,$H17*($G$12<=$E17)*($G$13>=$F17),$H17*($G$12<=$F17)*($G$13>=$E17))
S17: @IF($A17=1,$H17*($G$13<=$E17)*($G$14>=$F17),$H17*($G$13<=$F17)*($G$14>=$E17))
T17: @IF($A17=1,$H17*($G$14<=$E17)*($G$15>=$F17),$H17*($G$14<=$F17)*($G$15>=$E17))
U17: @IF($A17=1,$H17*($G$15<=$E17)*($G$16>=$F17),$H17*($G$15<=$F17)*($G$16>=$E17))
V17: @IF($A17=1,$H17*($G$16<=$E17)*($G$17>=$F17),$H17*($G$16<=$F17)*($G$17>=$E17))
W17: @IF($A17=1,$H17*($G$17<=$E17)*($G$18>=$F17),$H17*($G$17<=$F17)*($G$18>=$E17))
X17: @IF($A17=1,$H17*($G$18<=$E17)*($G$19>=$F17),$H17*($G$18<=$F17)*($G$19>=$E17))
Y17: @IF($A17=1,$H17*($G$19<=$E17)*($G$20>=$F17),$H17*($G$19<=$F17)*($G$20>=$E17))
Z17: @IF($A17=1,$H17*($G$20<=$E17)*($G$21>=$F17),$H17*($G$20<=$F17)*($G$21>=$E17))
AA17: @IF($A17=1,$H17*($G$21<=$E17)*($G$22>=$F17),$H17*($G$21<=$F17)*($G$22>=$E17))
AB17: @IF($A17=1,$H17*($G$22<=$E17)*($G$23>=$F17),$H17*($G$22<=$F17)*($G$23>=$E17))
AC17: @IF($A17=1,$H17*($G$23<=$E17)*($G$24>=$F17),$H17*($G$23<=$F17)*($G$24>=$E17))
AD17: @IF($A17=1,$H17*($G$24<=$E17)*($G$25>=$F17),$H17*($G$24<=$F17)*($G$25>=$E17))
AE17: @IF($A17=1,$H17*($G$25<=$E17)*($G$26>=$F17),$H17*($G$25<=$F17)*($G$26>=$E17))
AF17: @IF($A17=1,$H17*($G$26<=$E17)*($G$27>=$F17),$H17*($G$26<=$F17)*($G$27>=$E17))
AG17: @IF($A17=1,$H17*($G$27<=$E17)*($G$28>=$F17),$H17*($G$27<=$F17)*($G$28>=$E17))
AH17: @IF($A17=1,$H17*($G$28<=$E17)*($G$29>=$F17),$H17*($G$28<=$F17)*($G$29>=$E17))
AI17: @IF($A17=1,$H17*($G$29<=$E17)*($G$30>=$F17),$H17*($G$29<=$F17)*($G$30>=$E17))
AJ17: @IF($A17=1,$H17*($G$30<=$E17)*($G$31>=$F17),$H17*($G$30<=$F17)*($G$31>=$E17))
AK17: @IF($A17=1,$H17*($G$31<=$E17)*($G$32>=$F17),$H17*($G$31<=$F17)*($G$32>=$E17))
AL17: @IF($A17=1,$H17*($G$32<=$E17)*($G$33>=$F17),$H17*($G$32<=$F17)*($G$33>=$E17))
AM17: @IF($A17=1,$H17*($G$33<=$E17)*($G$34>=$F17),$H17*($G$33<=$F17)*($G$34>=$E17))
AN17: @IF($A17=1,$H17*($G$34<=$E17)*($G$35>=$F17),$H17*($G$34<=$F17)*($G$35>=$E17))
```

```
AO17: @IF($A17=1,$H17*($G$35<=$E17)*($G$36>=$F17),$H17*($G$35<=$F17)*($G$36>=$E17))
AP17: @IF($A17=1,$H17*($G$36<=$E17)*($G$37>=$F17),$H17*($G$36<=$F17)*($G$37>=$E17))
AQ17: @IF($A17=1,$H17*($G$37<=$E17)*($G$38>=$F17),$H17*($G$37<=$F17)*($G$38>=$E17))
AR17: @IF($A17=1,$H17*($G$38<=$E17)*($G$39>=$F17),$H17*($G$38<=$F17)*($G$39>=$E17))
AS17: @IF($A17=1,$H17*($G$39<=$E17)*($G$40>=$F17),$H17*($G$39<=$F17)*($G$40>=$E17))
AT17: @IF($A17=1,$H17*($G$40<=$E17)*($G$41>=$F17),$H17*($G$40<=$F17)*($G$41>=$E17))
AU17: @IF($A17=1,$H17*($G$41<=$E17)*($G$42>=$F17),$H17*($G$41<=$F17)*($G$42>=$E17))
AV17: @IF($A17=1,$H17*($G$42<=$E17)*($G$43>=$F17),$H17*($G$42<=$F17)*($G$43>=$E17))
AW17: @IF($A17=1,$H17*($G$43<=$E17)*($G$44>=$F17),$H17*($G$43<=$F17)*($G$44>=$E17))
AX17: @IF($A17=1,$H17*($G$44<=$E17)*($G$45>=$F17),$H17*($G$44<=$F17)*($G$45>=$E17))
AY17: @IF($A17=1,$H17*($G$45<=$E17)*($G$46>=$F17),$H17*($G$45<=$F17)*($G$46>=$E17))
AZ17: @IF($A17=1,$H17*($G$46<=$E17)*($G$47>=$F17),$H17*($G$46<=$F17)*($G$47>=$E17))
BA17: @IF($A17=1,$H17*($G$47<=$E17)*($G$48>=$F17),$H17*($G$47<=$F17)*($G$48>=$E17))
BB17: @IF($A17=1,$H17*($G$48<=$E17)*($G$49>=$F17),$H17*($G$48<=$F17)*($G$49>=$E17))
BC17: @IF($A17=1,$H17*($G$49<=$E17)*($G$50>=$F17),$H17*($G$49<=$F17)*($G$50>=$E17))
BD17: @IF($A17=1,$H17*($G$50<=$E17)*($G$51>=$F17),$H17*($G$50<=$F17)*($G$51>=$E17))
BE17: @IF($A17=1,$H17*($G$51<=$E17)*($G$52>=$F17),$H17*($G$51<=$F17)*($G$52>=$E17))
BF17: @IF($A17=1,$H17*($G$52<=$E17)*($G$53>=$F17),$H17*($G$52<=$F17)*($G$53>=$E17))
BG17: @IF($A17=1,$H17*($G$53<=$E17)*($G$54>=$F17),$H17*($G$53<=$F17)*($G$54>=$E17))
BH17: @IF($A17=1,$H17*($G$54<=$E17)*($G$55>=$F17),$H17*($G$54<=$F17)*($G$55>=$E17))
BI17: @IF($A17=1,$H17*($G$55<=$E17)*($G$56>=$F17),$H17*($G$55<=$F17)*($G$56>=$E17))
BJ17: @IF($A17=1,$H17*($G$56<=$E17)*($G$57>=$F17),$H17*($G$56<=$F17)*($G$57>=$E17))
BK17: @IF($A17=1,$H17*($G$57<=$E17)*($G$58>=$F17),$H17*($G$57<=$F17)*($G$58>=$E17))
BL17: @IF($A17=1,$H17*($G$58<=$E17)*($G$59>=$F17),$H17*($G$58<=$F17)*($G$59>=$E17))
BM17: @IF($A17=1,$H17*($G$59<=$E17)*($G$60>=$F17),$H17*($G$59<=$F17)*($G$60>=$E17))
BN17: @IF($A17=1,$H17*($G$60<=$E17)*($G$61>=$F17),$H17*($G$60<=$F17)*($G$61>=$E17))
BO17: @IF($A17=1,$H17*($G$61<=$E17)*($G$62>=$F17),$H17*($G$61<=$F17)*($G$62>=$E17))
BP17: @IF($A17=1,$H17*($G$62<=$E17)*($G$63>=$F17),$H17*($G$62<=$F17)*($G$63>=$E17))
BQ17: @IF($A17=1,$H17*($G$63<=$E17)*($G$64>=$F17),$H17*($G$63<=$F17)*($G$64>=$E17))
BR17: @IF($A17=1,$H17*($G$64<=$E17)*($G$65>=$F17),$H17*($G$64<=$F17)*($G$65>=$E17))
BS17: @IF($A17=1,$H17*($G$65<=$E17)*($G$66>=$F17),$H17*($G$65<=$F17)*($G$66>=$E17))
BT17: @IF($A17=1,$H17*($G$66<=$E17)*($G$67>=$F17),$H17*($G$66<=$F17)*($G$67>=$E17))
BU17: @IF($A17=1,$H17*($G$67<=$E17)*($G$68>=$F17),$H17*($G$67<=$F17)*($G$68>=$E17))
BV17: @IF($A17=1,$H17*($G$68<=$E17)*($G$69>=$F17),$H17*($G$68<=$F17)*($G$69>=$E17))
BW17: @IF($A17=1,$H17*($G$69<=$E17)*($G$70>=$F17),$H17*($G$69<=$F17)*($G$70>=$E17))
BX17: @IF($A17=1,$H17*($G$70<=$E17)*($G$71>=$F17),$H17*($G$70<=$F17)*($G$71>=$E17))
BY17: @IF($A17=1,$H17*($G$71<=$E17)*($G$72>=$F17),$H17*($G$71<=$F17)*($G$72>=$E17))
BZ17: @IF($A17=1,$H17*($G$72<=$E17)*($G$73>=$F17),$H17*($G$72<=$F17)*($G$73>=$E17))
P18: @IF($A18=1,$H18*($G$10<=$E18)*($G$11>=$F18),$H18*($G$10<=$F18)*($G$11>=$E18))
Q18: @IF($A18=1,$H18*($G$11<=$E18)*($G$12>=$F18),$H18*($G$11<=$F18)*($G$12>=$E18))
R18: @IF($A18=1,$H18*($G$12<=$E18)*($G$13>=$F18),$H18*($G$12<=$F18)*($G$13>=$E18))
S18: @IF($A18=1,$H18*($G$13<=$E18)*($G$14>=$F18),$H18*($G$13<=$F18)*($G$14>=$E18))
T18: @IF($A18=1,$H18*($G$14<=$E18)*($G$15>=$F18),$H18*($G$14<=$F18)*($G$15>=$E18))
U18: @IF($A18=1,$H18*($G$15<=$E18)*($G$16>=$F18),$H18*($G$15<=$F18)*($G$16>=$E18))
V18: @IF($A18=1,$H18*($G$16<=$E18)*($G$17>=$F18),$H18*($G$16<=$F18)*($G$17>=$E18))
W18: @IF($A18=1,$H18*($G$17<=$E18)*($G$18>=$F18),$H18*($G$17<=$F18)*($G$18>=$E18))
X18: @IF($A18=1,$H18*($G$18<=$E18)*($G$19>=$F18),$H18*($G$18<=$F18)*($G$19>=$E18))
Y18: @IF($A18=1,$H18*($G$19<=$E18)*($G$20>=$F18),$H18*($G$19<=$F18)*($G$20>=$E18))
Z18: @IF($A18=1,$H18*($G$20<=$E18)*($G$21>=$F18),$H18*($G$20<=$F18)*($G$21>=$E18))
AA18: @IF($A18=1,$H18*($G$21<=$E18)*($G$22>=$F18),$H18*($G$21<=$F18)*($G$22>=$E18))
AB18: @IF($A18=1,$H18*($G$22<=$E18)*($G$23>=$F18),$H18*($G$22<=$F18)*($G$23>=$E18))
AC18: @IF($A18=1,$H18*($G$23<=$E18)*($G$24>=$F18),$H18*($G$23<=$F18)*($G$24>=$E18))
AD18: @IF($A18=1,$H18*($G$24<=$E18)*($G$25>=$F18),$H18*($G$24<=$F18)*($G$25>=$E18))
AE18: @IF($A18=1,$H18*($G$25<=$E18)*($G$26>=$F18),$H18*($G$25<=$F18)*($G$26>=$E18))
AF18: @IF($A18=1,$H18*($G$26<=$E18)*($G$27>=$F18),$H18*($G$26<=$F18)*($G$27>=$E18))
AG18: @IF($A18=1,$H18*($G$27<=$E18)*($G$28>=$F18),$H18*($G$27<=$F18)*($G$28>=$E18))
```

```
AH18: @IF($A18=1,$H18*($G$28<=$E18)*($G$29>=$F18),$H18*($G$28<=$F18)*($G$29>=$E18))
AI18: @IF($A18=1,$H18*($G$29<=$E18)*($G$30>=$F18),$H18*($G$29<=$F18)*($G$30>=$E18))
AJ18: @IF($A18=1,$H18*($G$30<=$E18)*($G$31>=$F18),$H18*($G$30<=$F18)*($G$31>=$E18))
AK18: @IF($A18=1,$H18*($G$31<=$E18)*($G$32>=$F18),$H18*($G$31<=$F18)*($G$32>=$E18))
AL18: @IF($A18=1,$H18*($G$32<=$E18)*($G$33>=$F18),$H18*($G$32<=$F18)*($G$33>=$E18))
AM18: @IF($A18=1,$H18*($G$33<=$E18)*($G$34>=$F18),$H18*($G$33<=$F18)*($G$34>=$E18))
AN18: @IF($A18=1,$H18*($G$34<=$E18)*($G$35>=$F18),$H18*($G$34<=$F18)*($G$35>=$E18))
AO18: @IF($A18=1,$H18*($G$35<=$E18)*($G$36>=$F18),$H18*($G$35<=$F18)*($G$36>=$E18))
AP18: @IF($A18=1,$H18*($G$36<=$E18)*($G$37>=$F18),$H18*($G$36<=$F18)*($G$37>=$E18))
AQ18: @IF($A18=1,$H18*($G$37<=$E18)*($G$38>=$F18),$H18*($G$37<=$F18)*($G$38>=$E18))
AR18: @IF($A18=1,$H18*($G$38<=$E18)*($G$39>=$F18),$H18*($G$38<=$F18)*($G$39>=$E18))
AS18: @IF($A18=1,$H18*($G$39<=$E18)*($G$40>=$F18),$H18*($G$39<=$F18)*($G$40>=$E18))
AT18: @IF($A18=1,$H18*($G$40<=$E18)*($G$41>=$F18),$H18*($G$40<=$F18)*($G$41>=$E18))
AU18: @IF($A18=1,$H18*($G$41<=$E18)*($G$42>=$F18),$H18*($G$41<=$F18)*($G$42>=$E18))
AV18: @IF($A18=1,$H18*($G$42<=$E18)*($G$43>=$F18),$H18*($G$42<=$F18)*($G$43>=$E18))
AW18: @IF($A18=1,$H18*($G$43<=$E18)*($G$44>=$F18),$H18*($G$43<=$F18)*($G$44>=$E18))
AX18: @IF($A18=1,$H18*($G$44<=$E18)*($G$45>=$F18),$H18*($G$44<=$F18)*($G$45>=$E18))
AY18: @IF($A18=1,$H18*($G$45<=$E18)*($G$46>=$F18),$H18*($G$45<=$F18)*($G$46>=$E18))
AZ18: @IF($A18=1,$H18*($G$46<=$E18)*($G$47>=$F18),$H18*($G$46<=$F18)*($G$47>=$E18))
BA18: @IF($A18=1,$H18*($G$47<=$E18)*($G$48>=$F18),$H18*($G$47<=$F18)*($G$48>=$E18))
BB18: @IF($A18=1,$H18*($G$48<=$E18)*($G$49>=$F18),$H18*($G$48<=$F18)*($G$49>=$E18))
BC18: @IF($A18=1,$H18*($G$49<=$E18)*($G$50>=$F18),$H18*($G$49<=$F18)*($G$50>=$E18))
BD18: @IF($A18=1,$H18*($G$50<=$E18)*($G$51>=$F18),$H18*($G$50<=$F18)*($G$51>=$E18))
BE18: @IF($A18=1,$H18*($G$51<=$E18)*($G$52>=$F18),$H18*($G$51<=$F18)*($G$52>=$E18))
BF18: @IF($A18=1,$H18*($G$52<=$E18)*($G$53>=$F18),$H18*($G$52<=$F18)*($G$53>=$E18))
BG18: @IF($A18=1,$H18*($G$53<=$E18)*($G$54>=$F18),$H18*($G$53<=$F18)*($G$54>=$E18))
BH18: @IF($A18=1,$H18*($G$54<=$E18)*($G$55>=$F18),$H18*($G$54<=$F18)*($G$55>=$E18))
BI18: @IF($A18=1,$H18*($G$55<=$E18)*($G$56>=$F18),$H18*($G$55<=$F18)*($G$56>=$E18))
BJ18: @IF($A18=1,$H18*($G$56<=$E18)*($G$57>=$F18),$H18*($G$56<=$F18)*($G$57>=$E18))
BK18: @IF($A18=1,$H18*($G$57<=$E18)*($G$58>=$F18),$H18*($G$57<=$F18)*($G$58>=$E18))
BL18: @IF($A18=1,$H18*($G$58<=$E18)*($G$59>=$F18),$H18*($G$58<=$F18)*($G$59>=$E18))
BM18: @IF($A18=1,$H18*($G$59<=$E18)*($G$60>=$F18),$H18*($G$59<=$F18)*($G$60>=$E18))
BN18: @IF($A18=1,$H18*($G$60<=$E18)*($G$61>=$F18),$H18*($G$60<=$F18)*($G$61>=$E18))
BO18: @IF($A18=1,$H18*($G$61<=$E18)*($G$62>=$F18),$H18*($G$61<=$F18)*($G$62>=$E18))
BP18: @IF($A18=1,$H18*($G$62<=$E18)*($G$63>=$F18),$H18*($G$62<=$F18)*($G$63>=$E18))
BQ18: @IF($A18=1,$H18*($G$63<=$E18)*($G$64>=$F18),$H18*($G$63<=$F18)*($G$64>=$E18))
BR18: @IF($A18=1,$H18*($G$64<=$E18)*($G$65>=$F18),$H18*($G$64<=$F18)*($G$65>=$E18))
BS18: @IF($A18=1,$H18*($G$65<=$E18)*($G$66>=$F18),$H18*($G$65<=$F18)*($G$66>=$E18))
BT18: @IF($A18=1,$H18*($G$66<=$E18)*($G$67>=$F18),$H18*($G$66<=$F18)*($G$67>=$E18))
BU18: @IF($A18=1,$H18*($G$67<=$E18)*($G$68>=$F18),$H18*($G$67<=$F18)*($G$68>=$E18))
BV18: @IF($A18=1,$H18*($G$68<=$E18)*($G$69>=$F18),$H18*($G$68<=$F18)*($G$69>=$E18))
BW18: @IF($A18=1,$H18*($G$69<=$E18)*($G$70>=$F18),$H18*($G$69<=$F18)*($G$70>=$E18))
BX18: @IF($A18=1,$H18*($G$70<=$E18)*($G$71>=$F18),$H18*($G$70<=$F18)*($G$71>=$E18))
BY18: @IF($A18=1,$H18*($G$71<=$E18)*($G$72>=$F18),$H18*($G$71<=$F18)*($G$72>=$E18))
BZ18: @IF($A18=1,$H18*($G$72<=$E18)*($G$73>=$F18),$H18*($G$72<=$F18)*($G$73>=$E18))
P19: @IF($A19=1,$H19*($G$10<=$E19)*($G$11>=$F19),$H19*($G$10<=$F19)*($G$11>=$E19))
Q19: @IF($A19=1,$H19*($G$11<=$E19)*($G$12>=$F19),$H19*($G$11<=$F19)*($G$12>=$E19))
R19: @IF($A19=1,$H19*($G$12<=$E19)*($G$13>=$F19),$H19*($G$12<=$F19)*($G$13>=$E19))
S19: @IF($A19=1,$H19*($G$13<=$E19)*($G$14>=$F19),$H19*($G$13<=$F19)*($G$14>=$E19))
T19: @IF($A19=1,$H19*($G$14<=$E19)*($G$15>=$F19),$H19*($G$14<=$F19)*($G$15>=$E19))
U19: @IF($A19=1,$H19*($G$15<=$E19)*($G$16>=$F19),$H19*($G$15<=$F19)*($G$16>=$E19))
V19: @IF($A19=1,$H19*($G$16<=$E19)*($G$17>=$F19),$H19*($G$16<=$F19)*($G$17>=$E19))
W19: @IF($A19=1,$H19*($G$17<=$E19)*($G$18>=$F19),$H19*($G$17<=$F19)*($G$18>=$E19))
X19: @IF($A19=1,$H19*($G$18<=$E19)*($G$19>=$F19),$H19*($G$18<=$F19)*($G$19>=$E19))
Y19: @IF($A19=1,$H19*($G$19<=$E19)*($G$20>=$F19),$H19*($G$19<=$F19)*($G$20>=$E19))
Z19: @IF($A19=1,$H19*($G$20<=$E19)*($G$21>=$F19),$H19*($G$20<=$F19)*($G$21>=$E19))
```

```
AA19: @IF($A19=1,$H19*($G$21<=$E19)*($G$22>=$F19),$H19*($G$21<=$F19)*($G$22>=$E19))
AB19: @IF($A19=1,$H19*($G$22<=$E19)*($G$23>=$F19),$H19*($G$22<=$F19)*($G$23>=$E19))
AC19: @IF($A19=1,$H19*($G$23<=$E19)*($G$24>=$F19),$H19*($G$23<=$F19)*($G$24>=$E19))
AD19: @IF($A19=1,$H19*($G$24<=$E19)*($G$25>=$F19),$H19*($G$24<=$F19)*($G$25>=$E19))
AE19: @IF($A19=1,$H19*($G$25<=$E19)*($G$26>=$F19),$H19*($G$25<=$F19)*($G$26>=$E19))
AF19: @IF($A19=1,$H19*($G$26<=$E19)*($G$27>=$F19),$H19*($G$26<=$F19)*($G$27>=$E19))
AG19: @IF($A19=1,$H19*($G$27<=$E19)*($G$28>=$F19),$H19*($G$27<=$F19)*($G$28>=$E19))
AH19: @IF($A19=1,$H19*($G$28<=$E19)*($G$29>=$F19),$H19*($G$28<=$F19)*($G$29>=$E19))
AI19: @IF($A19=1,$H19*($G$29<=$E19)*($G$30>=$F19),$H19*($G$29<=$F19)*($G$30>=$E19))
AJ19: @IF($A19=1,$H19*($G$30<=$E19)*($G$31>=$F19),$H19*($G$30<=$F19)*($G$31>=$E19))
AK19: @IF($A19=1,$H19*($G$31<=$E19)*($G$32>=$F19),$H19*($G$31<=$F19)*($G$32>=$E19))
AL19: @IF($A19=1,$H19*($G$32<=$E19)*($G$33>=$F19),$H19*($G$32<=$F19)*($G$33>=$E19))
AM19: @IF($A19=1,$H19*($G$33<=$E19)*($G$34>=$F19),$H19*($G$33<=$F19)*($G$34>=$E19))
AN19: @IF($A19=1,$H19*($G$34<=$E19)*($G$35>=$F19),$H19*($G$34<=$F19)*($G$35>=$E19))
AO19: @IF($A19=1,$H19*($G$35<=$E19)*($G$36>=$F19),$H19*($G$35<=$F19)*($G$36>=$E19))
AP19: @IF($A19=1,$H19*($G$36<=$E19)*($G$37>=$F19),$H19*($G$36<=$F19)*($G$37>=$E19))
AQ19: @IF($A19=1,$H19*($G$37<=$E19)*($G$38>=$F19),$H19*($G$37<=$F19)*($G$38>=$E19))
AR19: @IF($A19=1,$H19*($G$38<=$E19)*($G$39>=$F19),$H19*($G$38<=$F19)*($G$39>=$E19))
AS19: @IF($A19=1,$H19*($G$39<=$E19)*($G$40>=$F19),$H19*($G$39<=$F19)*($G$40>=$E19))
AT19: @IF($A19=1,$H19*($G$40<=$E19)*($G$41>=$F19),$H19*($G$40<=$F19)*($G$41>=$E19))
AU19: @IF($A19=1,$H19*($G$41<=$E19)*($G$42>=$F19),$H19*($G$41<=$F19)*($G$42>=$E19))
AV19: @IF($A19=1,$H19*($G$42<=$E19)*($G$43>=$F19),$H19*($G$42<=$F19)*($G$43>=$E19))
AW19: @IF($A19=1,$H19*($G$43<=$E19)*($G$44>=$F19),$H19*($G$43<=$F19)*($G$44>=$E19))
AX19: @IF($A19=1,$H19*($G$44<=$E19)*($G$45>=$F19),$H19*($G$44<=$F19)*($G$45>=$E19))
AY19: @IF($A19=1,$H19*($G$45<=$E19)*($G$46>=$F19),$H19*($G$45<=$F19)*($G$46>=$E19))
AZ19: @IF($A19=1,$H19*($G$46<=$E19)*($G$47>=$F19),$H19*($G$46<=$F19)*($G$47>=$E19))
BA19: @IF($A19=1,$H19*($G$47<=$E19)*($G$48>=$F19),$H19*($G$47<=$F19)*($G$48>=$E19))
BB19: @IF($A19=1,$H19*($G$48<=$E19)*($G$49>=$F19),$H19*($G$48<=$F19)*($G$49>=$E19))
BC19: @IF($A19=1,$H19*($G$49<=$E19)*($G$50>=$F19),$H19*($G$49<=$F19)*($G$50>=$E19))
BD19: @IF($A19=1,$H19*($G$50<=$E19)*($G$51>=$F19),$H19*($G$50<=$F19)*($G$51>=$E19))
BE19: @IF($A19=1,$H19*($G$51<=$E19)*($G$52>=$F19),$H19*($G$51<=$F19)*($G$52>=$E19))
BF19: @IF($A19=1,$H19*($G$52<=$E19)*($G$53>=$F19),$H19*($G$52<=$F19)*($G$53>=$E19))
BG19: @IF($A19=1,$H19*($G$53<=$E19)*($G$54>=$F19),$H19*($G$53<=$F19)*($G$54>=$E19))
BH19: @IF($A19=1,$H19*($G$54<=$E19)*($G$55>=$F19),$H19*($G$54<=$F19)*($G$55>=$E19))
BI19: @IF($A19=1,$H19*($G$55<=$E19)*($G$56>=$F19),$H19*($G$55<=$F19)*($G$56>=$E19))
BJ19: @IF($A19=1,$H19*($G$56<=$E19)*($G$57>=$F19),$H19*($G$56<=$F19)*($G$57>=$E19))
BK19: @IF($A19=1,$H19*($G$57<=$E19)*($G$58>=$F19),$H19*($G$57<=$F19)*($G$58>=$E19))
BL19: @IF($A19=1,$H19*($G$58<=$E19)*($G$59>=$F19),$H19*($G$58<=$F19)*($G$59>=$E19))
BM19: @IF($A19=1,$H19*($G$59<=$E19)*($G$60>=$F19),$H19*($G$59<=$F19)*($G$60>=$E19))
BN19: @IF($A19=1,$H19*($G$60<=$E19)*($G$61>=$F19),$H19*($G$60<=$F19)*($G$61>=$E19))
BO19: @IF($A19=1,$H19*($G$61<=$E19)*($G$62>=$F19),$H19*($G$61<=$F19)*($G$62>=$E19))
BP19: @IF($A19=1,$H19*($G$62<=$E19)*($G$63>=$F19),$H19*($G$62<=$F19)*($G$63>=$E19))
BQ19: @IF($A19=1,$H19*($G$63<=$E19)*($G$64>=$F19),$H19*($G$63<=$F19)*($G$64>=$E19))
BR19: @IF($A19=1,$H19*($G$64<=$E19)*($G$65>=$F19),$H19*($G$64<=$F19)*($G$65>=$E19))
BS19: @IF($A19=1,$H19*($G$65<=$E19)*($G$66>=$F19),$H19*($G$65<=$F19)*($G$66>=$E19))
BT19: @IF($A19=1,$H19*($G$66<=$E19)*($G$67>=$F19),$H19*($G$66<=$F19)*($G$67>=$E19))
BU19: @IF($A19=1,$H19*($G$67<=$E19)*($G$68>=$F19),$H19*($G$67<=$F19)*($G$68>=$E19))
BV19: @IF($A19=1,$H19*($G$68<=$E19)*($G$69>=$F19),$H19*($G$68<=$F19)*($G$69>=$E19))
BW19: @IF($A19=1,$H19*($G$69<=$E19)*($G$70>=$F19),$H19*($G$69<=$F19)*($G$70>=$E19))
BX19: @IF($A19=1,$H19*($G$70<=$E19)*($G$71>=$F19),$H19*($G$70<=$F19)*($G$71>=$E19))
BY19: @IF($A19=1,$H19*($G$71<=$E19)*($G$72>=$F19),$H19*($G$71<=$F19)*($G$72>=$E19))
BZ19: @IF($A19=1,$H19*($G$72<=$E19)*($G$73>=$F19),$H19*($G$72<=$F19)*($G$73>=$E19))
P20: @IF($A20=1,$H20*($G$10<=$E20)*($G$11>=$F20),$H20*($G$10<=$F20)*($G$11>=$E20))
Q20: @IF($A20=1,$H20*($G$11<=$E20)*($G$12>=$F20),$H20*($G$11<=$F20)*($G$12>=$E20))
R20: @IF($A20=1,$H20*($G$12<=$E20)*($G$13>=$F20),$H20*($G$12<=$F20)*($G$13>=$E20))
S20: @IF($A20=1,$H20*($G$13<=$E20)*($G$14>=$F20),$H20*($G$13<=$F20)*($G$14>=$E20))
```

```
T20: @IF($A20=1,$H20*($G$14<=$E20)*($G$15>=$F20),$H20*($G$14<=$F20)*($G$15>=$E20))
U20: @IF($A20=1,$H20*($G$15<=$E20)*($G$16>=$F20),$H20*($G$15<=$F20)*($G$16>=$E20))
V20: @IF($A20=1,$H20*($G$16<=$E20)*($G$17>=$F20),$H20*($G$16<=$F20)*($G$17>=$E20))
W20: @IF($A20=1,$H20*($G$17<=$E20)*($G$18>=$F20),$H20*($G$17<=$F20)*($G$18>=$E20))
X20: @IF($A20=1,$H20*($G$18<=$E20)*($G$19>=$F20),$H20*($G$18<=$F20)*($G$19>=$E20))
Y20: @IF($A20=1,$H20*($G$19<=$E20)*($G$20>=$F20),$H20*($G$19<=$F20)*($G$20>=$E20))
Z20: @IF($A20=1,$H20*($G$20<=$E20)*($G$21>=$F20),$H20*($G$20<=$F20)*($G$21>=$E20))
AA20: @IF($A20=1,$H20*($G$21<=$E20)*($G$22>=$F20),$H20*($G$21<=$F20)*($G$22>=$E20))
AB20: @IF($A20=1,$H20*($G$22<=$E20)*($G$23>=$F20),$H20*($G$22<=$F20)*($G$23>=$E20))
AC20: @IF($A20=1,$H20*($G$23<=$E20)*($G$24>=$F20),$H20*($G$23<=$F20)*($G$24>=$E20))
AD20: @IF($A20=1,$H20*($G$24<=$E20)*($G$25>=$F20),$H20*($G$24<=$F20)*($G$25>=$E20))
AE20: @IF($A20=1,$H20*($G$25<=$E20)*($G$26>=$F20),$H20*($G$25<=$F20)*($G$26>=$E20))
AF20: @IF($A20=1,$H20*($G$26<=$E20)*($G$27>=$F20),$H20*($G$26<=$F20)*($G$27>=$E20))
AG20: @IF($A20=1,$H20*($G$27<=$E20)*($G$28>=$F20),$H20*($G$27<=$F20)*($G$28>=$E20))
AH20: @IF($A20=1,$H20*($G$28<=$E20)*($G$29>=$F20),$H20*($G$28<=$F20)*($G$29>=$E20))
AI20: @IF($A20=1,$H20*($G$29<=$E20)*($G$30>=$F20),$H20*($G$29<=$F20)*($G$30>=$E20))
AJ20: @IF($A20=1,$H20*($G$30<=$E20)*($G$31>=$F20),$H20*($G$30<=$F20)*($G$31>=$E20))
AK20: @IF($A20=1,$H20*($G$31<=$E20)*($G$32>=$F20),$H20*($G$31<=$F20)*($G$32>=$E20))
AL20: @IF($A20=1,$H20*($G$32<=$E20)*($G$33>=$F20),$H20*($G$32<=$F20)*($G$33>=$E20))
AM20: @IF($A20=1,$H20*($G$33<=$E20)*($G$34>=$F20),$H20*($G$33<=$F20)*($G$34>=$E20))
AN20: @IF($A20=1,$H20*($G$34<=$E20)*($G$35>=$F20),$H20*($G$34<=$F20)*($G$35>=$E20))
AO20: @IF($A20=1,$H20*($G$35<=$E20)*($G$36>=$F20),$H20*($G$35<=$F20)*($G$36>=$E20))
AP20: @IF($A20=1,$H20*($G$36<=$E20)*($G$37>=$F20),$H20*($G$36<=$F20)*($G$37>=$E20))
AQ20: @IF($A20=1,$H20*($G$37<=$E20)*($G$38>=$F20),$H20*($G$37<=$F20)*($G$38>=$E20))
AR20: @IF($A20=1,$H20*($G$38<=$E20)*($G$39>=$F20),$H20*($G$38<=$F20)*($G$39>=$E20))
AS20: @IF($A20=1,$H20*($G$39<=$E20)*($G$40>=$F20),$H20*($G$39<=$F20)*($G$40>=$E20))
AT20: @IF($A20=1,$H20*($G$40<=$E20)*($G$41>=$F20),$H20*($G$40<=$F20)*($G$41>=$E20))
AU20: @IF($A20=1,$H20*($G$41<=$E20)*($G$42>=$F20),$H20*($G$41<=$F20)*($G$42>=$E20))
AV20: @IF($A20=1,$H20*($G$42<=$E20)*($G$43>=$F20),$H20*($G$42<=$F20)*($G$43>=$E20))
AW20: @IF($A20=1,$H20*($G$43<=$E20)*($G$44>=$F20),$H20*($G$43<=$F20)*($G$44>=$E20))
AX20: @IF($A20=1,$H20*($G$44<=$E20)*($G$45>=$F20),$H20*($G$44<=$F20)*($G$45>=$E20))
AY20: @IF($A20=1,$H20*($G$45<=$E20)*($G$46>=$F20),$H20*($G$45<=$F20)*($G$46>=$E20))
AZ20: @IF($A20=1,$H20*($G$46<=$E20)*($G$47>=$F20),$H20*($G$46<=$F20)*($G$47>=$E20))
BA20: @IF($A20=1,$H20*($G$47<=$E20)*($G$48>=$F20),$H20*($G$47<=$F20)*($G$48>=$E20))
BB20: @IF($A20=1,$H20*($G$48<=$E20)*($G$49>=$F20),$H20*($G$48<=$F20)*($G$49>=$E20))
BC20: @IF($A20=1,$H20*($G$49<=$E20)*($G$50>=$F20),$H20*($G$49<=$F20)*($G$50>=$E20))
BD20: @IF($A20=1,$H20*($G$50<=$E20)*($G$51>=$F20),$H20*($G$50<=$F20)*($G$51>=$E20))
BE20: @IF($A20=1,$H20*($G$51<=$E20)*($G$52>=$F20),$H20*($G$51<=$F20)*($G$52>=$E20))
BF20: @IF($A20=1,$H20*($G$52<=$E20)*($G$53>=$F20),$H20*($G$52<=$F20)*($G$53>=$E20))
BG20: @IF($A20=1,$H20*($G$53<=$E20)*($G$54>=$F20),$H20*($G$53<=$F20)*($G$54>=$E20))
BH20: @IF($A20=1,$H20*($G$54<=$E20)*($G$55>=$F20),$H20*($G$54<=$F20)*($G$55>=$E20))
BI20: @IF($A20=1,$H20*($G$55<=$E20)*($G$56>=$F20),$H20*($G$55<=$F20)*($G$56>=$E20))
BJ20: @IF($A20=1,$H20*($G$56<=$E20)*($G$57>=$F20),$H20*($G$56<=$F20)*($G$57>=$E20))
BK20: @IF($A20=1,$H20*($G$57<=$E20)*($G$58>=$F20),$H20*($G$57<=$F20)*($G$58>=$E20))
BL20: @IF($A20=1,$H20*($G$58<=$E20)*($G$59>=$F20),$H20*($G$58<=$F20)*($G$59>=$E20))
BM20: @IF($A20=1,$H20*($G$59<=$E20)*($G$60>=$F20),$H20*($G$59<=$F20)*($G$60>=$E20))
BN20: @IF($A20=1,$H20*($G$60<=$E20)*($G$61>=$F20),$H20*($G$60<=$F20)*($G$61>=$E20))
BO20: @IF($A20=1,$H20*($G$61<=$E20)*($G$62>=$F20),$H20*($G$61<=$F20)*($G$62>=$E20))
BP20: @IF($A20=1,$H20*($G$62<=$E20)*($G$63>=$F20),$H20*($G$62<=$F20)*($G$63>=$E20))
BQ20: @IF($A20=1,$H20*($G$63<=$E20)*($G$64>=$F20),$H20*($G$63<=$F20)*($G$64>=$E20))
BR20: @IF($A20=1,$H20*($G$64<=$E20)*($G$65>=$F20),$H20*($G$64<=$F20)*($G$65>=$E20))
BS20: @IF($A20=1,$H20*($G$65<=$E20)*($G$66>=$F20),$H20*($G$65<=$F20)*($G$66>=$E20))
BT20: @IF($A20=1,$H20*($G$66<=$E20)*($G$67>=$F20),$H20*($G$66<=$F20)*($G$67>=$E20))
BU20: @IF($A20=1,$H20*($G$67<=$E20)*($G$68>=$F20),$H20*($G$67<=$F20)*($G$68>=$E20))
BV20: @IF($A20=1,$H20*($G$68<=$E20)*($G$69>=$F20),$H20*($G$68<=$F20)*($G$69>=$E20))
BW20: @IF($A20=1,$H20*($G$69<=$E20)*($G$70>=$F20),$H20*($G$69<=$F20)*($G$70>=$E20))
```

BX20: @IF($A20=1,$H20*($G$70<=$E20)*($G$71>=$F20),$H20*($G$70<=$F20)*($G$71>=$E20))
BY20: @IF($A20=1,$H20*($G$71<=$E20)*($G$72>=$F20),$H20*($G$71<=$F20)*($G$72>=$E20))
BZ20: @IF($A20=1,$H20*($G$72<=$E20)*($G$73>=$F20),$H20*($G$72<=$F20)*($G$73>=$E20))
P21: @IF($A21=1,$H21*($G$10<=$E21)*($G$11>=$F21),$H21*($G$10<=$F21)*($G$11>=$E21))
Q21: @IF($A21=1,$H21*($G$11<=$E21)*($G$12>=$F21),$H21*($G$11<=$F21)*($G$12>=$E21))
R21: @IF($A21=1,$H21*($G$12<=$E21)*($G$13>=$F21),$H21*($G$12<=$F21)*($G$13>=$E21))
S21: @IF($A21=1,$H21*($G$13<=$E21)*($G$14>=$F21),$H21*($G$13<=$F21)*($G$14>=$E21))
T21: @IF($A21=1,$H21*($G$14<=$E21)*($G$15>=$F21),$H21*($G$14<=$F21)*($G$15>=$E21))
U21: @IF($A21=1,$H21*($G$15<=$E21)*($G$16>=$F21),$H21*($G$15<=$F21)*($G$16>=$E21))
V21: @IF($A21=1,$H21*($G$16<=$E21)*($G$17>=$F21),$H21*($G$16<=$F21)*($G$17>=$E21))
W21: @IF($A21=1,$H21*($G$17<=$E21)*($G$18>=$F21),$H21*($G$17<=$F21)*($G$18>=$E21))
X21: @IF($A21=1,$H21*($G$18<=$E21)*($G$19>=$F21),$H21*($G$18<=$F21)*($G$19>=$E21))
Y21: @IF($A21=1,$H21*($G$19<=$E21)*($G$20>=$F21),$H21*($G$19<=$F21)*($G$20>=$E21))
Z21: @IF($A21=1,$H21*($G$20<=$E21)*($G$21>=$F21),$H21*($G$20<=$F21)*($G$21>=$E21))
AA21: @IF($A21=1,$H21*($G$21<=$E21)*($G$22>=$F21),$H21*($G$21<=$F21)*($G$22>=$E21))
AB21: @IF($A21=1,$H21*($G$22<=$E21)*($G$23>=$F21),$H21*($G$22<=$F21)*($G$23>=$E21))
AC21: @IF($A21=1,$H21*($G$23<=$E21)*($G$24>=$F21),$H21*($G$23<=$F21)*($G$24>=$E21))
AD21: @IF($A21=1,$H21*($G$24<=$E21)*($G$25>=$F21),$H21*($G$24<=$F21)*($G$25>=$E21))
AE21: @IF($A21=1,$H21*($G$25<=$E21)*($G$26>=$F21),$H21*($G$25<=$F21)*($G$26>=$E21))
AF21: @IF($A21=1,$H21*($G$26<=$E21)*($G$27>=$F21),$H21*($G$26<=$F21)*($G$27>=$E21))
AG21: @IF($A21=1,$H21*($G$27<=$E21)*($G$28>=$F21),$H21*($G$27<=$F21)*($G$28>=$E21))
AH21: @IF($A21=1,$H21*($G$28<=$E21)*($G$29>=$F21),$H21*($G$28<=$F21)*($G$29>=$E21))
AI21: @IF($A21=1,$H21*($G$29<=$E21)*($G$30>=$F21),$H21*($G$29<=$F21)*($G$30>=$E21))
AJ21: @IF($A21=1,$H21*($G$30<=$E21)*($G$31>=$F21),$H21*($G$30<=$F21)*($G$31>=$E21))
AK21: @IF($A21=1,$H21*($G$31<=$E21)*($G$32>=$F21),$H21*($G$31<=$F21)*($G$32>=$E21))
AL21: @IF($A21=1,$H21*($G$32<=$E21)*($G$33>=$F21),$H21*($G$32<=$F21)*($G$33>=$E21))
AM21: @IF($A21=1,$H21*($G$33<=$E21)*($G$34>=$F21),$H21*($G$33<=$F21)*($G$34>=$E21))
AN21: @IF($A21=1,$H21*($G$34<=$E21)*($G$35>=$F21),$H21*($G$34<=$F21)*($G$35>=$E21))
AO21: @IF($A21=1,$H21*($G$35<=$E21)*($G$36>=$F21),$H21*($G$35<=$F21)*($G$36>=$E21))
AP21: @IF($A21=1,$H21*($G$36<=$E21)*($G$37>=$F21),$H21*($G$36<=$F21)*($G$37>=$E21))
AQ21: @IF($A21=1,$H21*($G$37<=$E21)*($G$38>=$F21),$H21*($G$37<=$F21)*($G$38>=$E21))
AR21: @IF($A21=1,$H21*($G$38<=$E21)*($G$39>=$F21),$H21*($G$38<=$F21)*($G$39>=$E21))
AS21: @IF($A21=1,$H21*($G$39<=$E21)*($G$40>=$F21),$H21*($G$39<=$F21)*($G$40>=$E21))
AT21: @IF($A21=1,$H21*($G$40<=$E21)*($G$41>=$F21),$H21*($G$40<=$F21)*($G$41>=$E21))
AU21: @IF($A21=1,$H21*($G$41<=$E21)*($G$42>=$F21),$H21*($G$41<=$F21)*($G$42>=$E21))
AV21: @IF($A21=1,$H21*($G$42<=$E21)*($G$43>=$F21),$H21*($G$42<=$F21)*($G$43>=$E21))
AW21: @IF($A21=1,$H21*($G$43<=$E21)*($G$44>=$F21),$H21*($G$43<=$F21)*($G$44>=$E21))
AX21: @IF($A21=1,$H21*($G$44<=$E21)*($G$45>=$F21),$H21*($G$44<=$F21)*($G$45>=$E21))
AY21: @IF($A21=1,$H21*($G$45<=$E21)*($G$46>=$F21),$H21*($G$45<=$F21)*($G$46>=$E21))
AZ21: @IF($A21=1,$H21*($G$46<=$E21)*($G$47>=$F21),$H21*($G$46<=$F21)*($G$47>=$E21))
BA21: @IF($A21=1,$H21*($G$47<=$E21)*($G$48>=$F21),$H21*($G$47<=$F21)*($G$48>=$E21))
BB21: @IF($A21=1,$H21*($G$48<=$E21)*($G$49>=$F21),$H21*($G$48<=$F21)*($G$49>=$E21))
BC21: @IF($A21=1,$H21*($G$49<=$E21)*($G$50>=$F21),$H21*($G$49<=$F21)*($G$50>=$E21))
BD21: @IF($A21=1,$H21*($G$50<=$E21)*($G$51>=$F21),$H21*($G$50<=$F21)*($G$51>=$E21))
BE21: @IF($A21=1,$H21*($G$51<=$E21)*($G$52>=$F21),$H21*($G$51<=$F21)*($G$52>=$E21))
BF21: @IF($A21=1,$H21*($G$52<=$E21)*($G$53>=$F21),$H21*($G$52<=$F21)*($G$53>=$E21))
BG21: @IF($A21=1,$H21*($G$53<=$E21)*($G$54>=$F21),$H21*($G$53<=$F21)*($G$54>=$E21))
BH21: @IF($A21=1,$H21*($G$54<=$E21)*($G$55>=$F21),$H21*($G$54<=$F21)*($G$55>=$E21))
BI21: @IF($A21=1,$H21*($G$55<=$E21)*($G$56>=$F21),$H21*($G$55<=$F21)*($G$56>=$E21))
BJ21: @IF($A21=1,$H21*($G$56<=$E21)*($G$57>=$F21),$H21*($G$56<=$F21)*($G$57>=$E21))
BK21: @IF($A21=1,$H21*($G$57<=$E21)*($G$58>=$F21),$H21*($G$57<=$F21)*($G$58>=$E21))
BL21: @IF($A21=1,$H21*($G$58<=$E21)*($G$59>=$F21),$H21*($G$58<=$F21)*($G$59>=$E21))
BM21: @IF($A21=1,$H21*($G$59<=$E21)*($G$60>=$F21),$H21*($G$59<=$F21)*($G$60>=$E21))
BN21: @IF($A21=1,$H21*($G$60<=$E21)*($G$61>=$F21),$H21*($G$60<=$F21)*($G$61>=$E21))
BO21: @IF($A21=1,$H21*($G$61<=$E21)*($G$62>=$F21),$H21*($G$61<=$F21)*($G$62>=$E21))
BP21: @IF($A21=1,$H21*($G$62<=$E21)*($G$63>=$F21),$H21*($G$62<=$F21)*($G$63>=$E21))

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BQ21: @IF($A21=1,$H21*($G$63<=$E21)*($G$64>=$F21),$H21*($G$63<=$F21)*($G$64>=$E21))
BR21: @IF($A21=1,$H21*($G$64<=$E21)*($G$65>=$F21),$H21*($G$64<=$F21)*($G$65>=$E21))
BS21: @IF($A21=1,$H21*($G$65<=$E21)*($G$66>=$F21),$H21*($G$65<=$F21)*($G$66>=$E21))
BT21: @IF($A21=1,$H21*($G$66<=$E21)*($G$67>=$F21),$H21*($G$66<=$F21)*($G$67>=$E21))
BU21: @IF($A21=1,$H21*($G$67<=$E21)*($G$68>=$F21),$H21*($G$67<=$F21)*($G$68>=$E21))
BV21: @IF($A21=1,$H21*($G$68<=$E21)*($G$69>=$F21),$H21*($G$68<=$F21)*($G$69>=$E21))
BW21: @IF($A21=1,$H21*($G$69<=$E21)*($G$70>=$F21),$H21*($G$69<=$F21)*($G$70>=$E21))
BX21: @IF($A21=1,$H21*($G$70<=$E21)*($G$71>=$F21),$H21*($G$70<=$F21)*($G$71>=$E21))
BY21: @IF($A21=1,$H21*($G$71<=$E21)*($G$72>=$F21),$H21*($G$71<=$F21)*($G$72>=$E21))
BZ21: @IF($A21=1,$H21*($G$72<=$E21)*($G$73>=$F21),$H21*($G$72<=$F21)*($G$73>=$E21))
P22: @IF($A22=1,$H22*($G$10<=$E22)*($G$11>=$F22),$H22*($G$10<=$F22)*($G$11>=$E22))
Q22: @IF($A22=1,$H22*($G$11<=$E22)*($G$12>=$F22),$H22*($G$11<=$F22)*($G$12>=$E22))
R22: @IF($A22=1,$H22*($G$12<=$E22)*($G$13>=$F22),$H22*($G$12<=$F22)*($G$13>=$E22))
S22: @IF($A22=1,$H22*($G$13<=$E22)*($G$14>=$F22),$H22*($G$13<=$F22)*($G$14>=$E22))
T22: @IF($A22=1,$H22*($G$14<=$E22)*($G$15>=$F22),$H22*($G$14<=$F22)*($G$15>=$E22))
U22: @IF($A22=1,$H22*($G$15<=$E22)*($G$16>=$F22),$H22*($G$15<=$F22)*($G$16>=$E22))
V22: @IF($A22=1,$H22*($G$16<=$E22)*($G$17>=$F22),$H22*($G$16<=$F22)*($G$17>=$E22))
W22: @IF($A22=1,$H22*($G$17<=$E22)*($G$18>=$F22),$H22*($G$17<=$F22)*($G$18>=$E22))
X22: @IF($A22=1,$H22*($G$18<=$E22)*($G$19>=$F22),$H22*($G$18<=$F22)*($G$19>=$E22))
Y22: @IF($A22=1,$H22*($G$19<=$E22)*($G$20>=$F22),$H22*($G$19<=$F22)*($G$20>=$E22))
Z22: @IF($A22=1,$H22*($G$20<=$E22)*($G$21>=$F22),$H22*($G$20<=$F22)*($G$21>=$E22))
AA22: @IF($A22=1,$H22*($G$21<=$E22)*($G$22>=$F22),$H22*($G$21<=$F22)*($G$22>=$E22))
AB22: @IF($A22=1,$H22*($G$22<=$E22)*($G$23>=$F22),$H22*($G$22<=$F22)*($G$23>=$E22))
AC22: @IF($A22=1,$H22*($G$23<=$E22)*($G$24>=$F22),$H22*($G$23<=$F22)*($G$24>=$E22))
AD22: @IF($A22=1,$H22*($G$24<=$E22)*($G$25>=$F22),$H22*($G$24<=$F22)*($G$25>=$E22))
AE22: @IF($A22=1,$H22*($G$25<=$E22)*($G$26>=$F22),$H22*($G$25<=$F22)*($G$26>=$E22))
AF22: @IF($A22=1,$H22*($G$26<=$E22)*($G$27>=$F22),$H22*($G$26<=$F22)*($G$27>=$E22))
AG22: @IF($A22=1,$H22*($G$27<=$E22)*($G$28>=$F22),$H22*($G$27<=$F22)*($G$28>=$E22))
AH22: @IF($A22=1,$H22*($G$28<=$E22)*($G$29>=$F22),$H22*($G$28<=$F22)*($G$29>=$E22))
AI22: @IF($A22=1,$H22*($G$29<=$E22)*($G$30>=$F22),$H22*($G$29<=$F22)*($G$30>=$E22))
AJ22: @IF($A22=1,$H22*($G$30<=$E22)*($G$31>=$F22),$H22*($G$30<=$F22)*($G$31>=$E22))
AK22: @IF($A22=1,$H22*($G$31<=$E22)*($G$32>=$F22),$H22*($G$31<=$F22)*($G$32>=$E22))
AL22: @IF($A22=1,$H22*($G$32<=$E22)*($G$33>=$F22),$H22*($G$32<=$F22)*($G$33>=$E22))
AM22: @IF($A22=1,$H22*($G$33<=$E22)*($G$34>=$F22),$H22*($G$33<=$F22)*($G$34>=$E22))
AN22: @IF($A22=1,$H22*($G$34<=$E22)*($G$35>=$F22),$H22*($G$34<=$F22)*($G$35>=$E22))
AO22: @IF($A22=1,$H22*($G$35<=$E22)*($G$36>=$F22),$H22*($G$35<=$F22)*($G$36>=$E22))
AP22: @IF($A22=1,$H22*($G$36<=$E22)*($G$37>=$F22),$H22*($G$36<=$F22)*($G$37>=$E22))
AQ22: @IF($A22=1,$H22*($G$37<=$E22)*($G$38>=$F22),$H22*($G$37<=$F22)*($G$38>=$E22))
AR22: @IF($A22=1,$H22*($G$38<=$E22)*($G$39>=$F22),$H22*($G$38<=$F22)*($G$39>=$E22))
AS22: @IF($A22=1,$H22*($G$39<=$E22)*($G$40>=$F22),$H22*($G$39<=$F22)*($G$40>=$E22))
AT22: @IF($A22=1,$H22*($G$40<=$E22)*($G$41>=$F22),$H22*($G$40<=$F22)*($G$41>=$E22))
AU22: @IF($A22=1,$H22*($G$41<=$E22)*($G$42>=$F22),$H22*($G$41<=$F22)*($G$42>=$E22))
AV22: @IF($A22=1,$H22*($G$42<=$E22)*($G$43>=$F22),$H22*($G$42<=$F22)*($G$43>=$E22))
AW22: @IF($A22=1,$H22*($G$43<=$E22)*($G$44>=$F22),$H22*($G$43<=$F22)*($G$44>=$E22))
AX22: @IF($A22=1,$H22*($G$44<=$E22)*($G$45>=$F22),$H22*($G$44<=$F22)*($G$45>=$E22))
AY22: @IF($A22=1,$H22*($G$45<=$E22)*($G$46>=$F22),$H22*($G$45<=$F22)*($G$46>=$E22))
AZ22: @IF($A22=1,$H22*($G$46<=$E22)*($G$47>=$F22),$H22*($G$46<=$F22)*($G$47>=$E22))
BA22: @IF($A22=1,$H22*($G$47<=$E22)*($G$48>=$F22),$H22*($G$47<=$F22)*($G$48>=$E22))
BB22: @IF($A22=1,$H22*($G$48<=$E22)*($G$49>=$F22),$H22*($G$48<=$F22)*($G$49>=$E22))
BC22: @IF($A22=1,$H22*($G$49<=$E22)*($G$50>=$F22),$H22*($G$49<=$F22)*($G$50>=$E22))
BD22: @IF($A22=1,$H22*($G$50<=$E22)*($G$51>=$F22),$H22*($G$50<=$F22)*($G$51>=$E22))
BE22: @IF($A22=1,$H22*($G$51<=$E22)*($G$52>=$F22),$H22*($G$51<=$F22)*($G$52>=$E22))
BF22: @IF($A22=1,$H22*($G$52<=$E22)*($G$53>=$F22),$H22*($G$52<=$F22)*($G$53>=$E22))
BG22: @IF($A22=1,$H22*($G$53<=$E22)*($G$54>=$F22),$H22*($G$53<=$F22)*($G$54>=$E22))
BH22: @IF($A22=1,$H22*($G$54<=$E22)*($G$55>=$F22),$H22*($G$54<=$F22)*($G$55>=$E22))
BI22: @IF($A22=1,$H22*($G$55<=$E22)*($G$56>=$F22),$H22*($G$55<=$F22)*($G$56>=$E22))
```

```
BJ22: @IF($A22=1,$H22*($G$56<=$E22)*($G$57>=$F22),$H22*($G$56<=$F22)*($G$57>=$E22))
BK22: @IF($A22=1,$H22*($G$57<=$E22)*($G$58>=$F22),$H22*($G$57<=$F22)*($G$58>=$E22))
BL22: @IF($A22=1,$H22*($G$58<=$E22)*($G$59>=$F22),$H22*($G$58<=$F22)*($G$59>=$E22))
BM22: @IF($A22=1,$H22*($G$59<=$E22)*($G$60>=$F22),$H22*($G$59<=$F22)*($G$60>=$E22))
BN22: @IF($A22=1,$H22*($G$60<=$E22)*($G$61>=$F22),$H22*($G$60<=$F22)*($G$61>=$E22))
BO22: @IF($A22=1,$H22*($G$61<=$E22)*($G$62>=$F22),$H22*($G$61<=$F22)*($G$62>=$E22))
BP22: @IF($A22=1,$H22*($G$62<=$E22)*($G$63>=$F22),$H22*($G$62<=$F22)*($G$63>=$E22))
BQ22: @IF($A22=1,$H22*($G$63<=$E22)*($G$64>=$F22),$H22*($G$63<=$F22)*($G$64>=$E22))
BR22: @IF($A22=1,$H22*($G$64<=$E22)*($G$65>=$F22),$H22*($G$64<=$F22)*($G$65>=$E22))
BS22: @IF($A22=1,$H22*($G$65<=$E22)*($G$66>=$F22),$H22*($G$65<=$F22)*($G$66>=$E22))
BT22: @IF($A22=1,$H22*($G$66<=$E22)*($G$67>=$F22),$H22*($G$66<=$F22)*($G$67>=$E22))
BU22: @IF($A22=1,$H22*($G$67<=$E22)*($G$68>=$F22),$H22*($G$67<=$F22)*($G$68>=$E22))
BV22: @IF($A22=1,$H22*($G$68<=$E22)*($G$69>=$F22),$H22*($G$68<=$F22)*($G$69>=$E22))
BW22: @IF($A22=1,$H22*($G$69<=$E22)*($G$70>=$F22),$H22*($G$69<=$F22)*($G$70>=$E22))
BX22: @IF($A22=1,$H22*($G$70<=$E22)*($G$71>=$F22),$H22*($G$70<=$F22)*($G$71>=$E22))
BY22: @IF($A22=1,$H22*($G$71<=$E22)*($G$72>=$F22),$H22*($G$71<=$F22)*($G$72>=$E22))
BZ22: @IF($A22=1,$H22*($G$72<=$E22)*($G$73>=$F22),$H22*($G$72<=$F22)*($G$73>=$E22))
P23: @IF($A23=1,$H23*($G$10<=$E23)*($G$11>=$F23),$H23*($G$10<=$F23)*($G$11>=$E23))
Q23: @IF($A23=1,$H23*($G$11<=$E23)*($G$12>=$F23),$H23*($G$11<=$F23)*($G$12>=$E23))
R23: @IF($A23=1,$H23*($G$12<=$E23)*($G$13>=$F23),$H23*($G$12<=$F23)*($G$13>=$E23))
S23: @IF($A23=1,$H23*($G$13<=$E23)*($G$14>=$F23),$H23*($G$13<=$F23)*($G$14>=$E23))
T23: @IF($A23=1,$H23*($G$14<=$E23)*($G$15>=$F23),$H23*($G$14<=$F23)*($G$15>=$E23))
U23: @IF($A23=1,$H23*($G$15<=$E23)*($G$16>=$F23),$H23*($G$15<=$F23)*($G$16>=$E23))
V23: @IF($A23=1,$H23*($G$16<=$E23)*($G$17>=$F23),$H23*($G$16<=$F23)*($G$17>=$E23))
W23: @IF($A23=1,$H23*($G$17<=$E23)*($G$18>=$F23),$H23*($G$17<=$F23)*($G$18>=$E23))
X23: @IF($A23=1,$H23*($G$18<=$E23)*($G$19>=$F23),$H23*($G$18<=$F23)*($G$19>=$E23))
Y23: @IF($A23=1,$H23*($G$19<=$E23)*($G$20>=$F23),$H23*($G$19<=$F23)*($G$20>=$E23))
Z23: @IF($A23=1,$H23*($G$20<=$E23)*($G$21>=$F23),$H23*($G$20<=$F23)*($G$21>=$E23))
AA23: @IF($A23=1,$H23*($G$21<=$E23)*($G$22>=$F23),$H23*($G$21<=$F23)*($G$22>=$E23))
AB23: @IF($A23=1,$H23*($G$22<=$E23)*($G$23>=$F23),$H23*($G$22<=$F23)*($G$23>=$E23))
AC23: @IF($A23=1,$H23*($G$23<=$E23)*($G$24>=$F23),$H23*($G$23<=$F23)*($G$24>=$E23))
AD23: @IF($A23=1,$H23*($G$24<=$E23)*($G$25>=$F23),$H23*($G$24<=$F23)*($G$25>=$E23))
AE23: @IF($A23=1,$H23*($G$25<=$E23)*($G$26>=$F23),$H23*($G$25<=$F23)*($G$26>=$E23))
AF23: @IF($A23=1,$H23*($G$26<=$E23)*($G$27>=$F23),$H23*($G$26<=$F23)*($G$27>=$E23))
AG23: @IF($A23=1,$H23*($G$27<=$E23)*($G$28>=$F23),$H23*($G$27<=$F23)*($G$28>=$E23))
AH23: @IF($A23=1,$H23*($G$28<=$E23)*($G$29>=$F23),$H23*($G$28<=$F23)*($G$29>=$E23))
AI23: @IF($A23=1,$H23*($G$29<=$E23)*($G$30>=$F23),$H23*($G$29<=$F23)*($G$30>=$E23))
AJ23: @IF($A23=1,$H23*($G$30<=$E23)*($G$31>=$F23),$H23*($G$30<=$F23)*($G$31>=$E23))
AK23: @IF($A23=1,$H23*($G$31<=$E23)*($G$32>=$F23),$H23*($G$31<=$F23)*($G$32>=$E23))
AL23: @IF($A23=1,$H23*($G$32<=$E23)*($G$33>=$F23),$H23*($G$32<=$F23)*($G$33>=$E23))
AM23: @IF($A23=1,$H23*($G$33<=$E23)*($G$34>=$F23),$H23*($G$33<=$F23)*($G$34>=$E23))
AN23: @IF($A23=1,$H23*($G$34<=$E23)*($G$35>=$F23),$H23*($G$34<=$F23)*($G$35>=$E23))
AO23: @IF($A23=1,$H23*($G$35<=$E23)*($G$36>=$F23),$H23*($G$35<=$F23)*($G$36>=$E23))
AP23: @IF($A23=1,$H23*($G$36<=$E23)*($G$37>=$F23),$H23*($G$36<=$F23)*($G$37>=$E23))
AQ23: @IF($A23=1,$H23*($G$37<=$E23)*($G$38>=$F23),$H23*($G$37<=$F23)*($G$38>=$E23))
AR23: @IF($A23=1,$H23*($G$38<=$E23)*($G$39>=$F23),$H23*($G$38<=$F23)*($G$39>=$E23))
AS23: @IF($A23=1,$H23*($G$39<=$E23)*($G$40>=$F23),$H23*($G$39<=$F23)*($G$40>=$E23))
AT23: @IF($A23=1,$H23*($G$40<=$E23)*($G$41>=$F23),$H23*($G$40<=$F23)*($G$41>=$E23))
AU23: @IF($A23=1,$H23*($G$41<=$E23)*($G$42>=$F23),$H23*($G$41<=$F23)*($G$42>=$E23))
AV23: @IF($A23=1,$H23*($G$42<=$E23)*($G$43>=$F23),$H23*($G$42<=$F23)*($G$43>=$E23))
AW23: @IF($A23=1,$H23*($G$43<=$E23)*($G$44>=$F23),$H23*($G$43<=$F23)*($G$44>=$E23))
AX23: @IF($A23=1,$H23*($G$44<=$E23)*($G$45>=$F23),$H23*($G$44<=$F23)*($G$45>=$E23))
AY23: @IF($A23=1,$H23*($G$45<=$E23)*($G$46>=$F23),$H23*($G$45<=$F23)*($G$46>=$E23))
AZ23: @IF($A23=1,$H23*($G$46<=$E23)*($G$47>=$F23),$H23*($G$46<=$F23)*($G$47>=$E23))
BA23: @IF($A23=1,$H23*($G$47<=$E23)*($G$48>=$F23),$H23*($G$47<=$F23)*($G$48>=$E23))
BB23: @IF($A23=1,$H23*($G$48<=$E23)*($G$49>=$F23),$H23*($G$48<=$F23)*($G$49>=$E23))
```

```
BC23: @IF($A23=1,$H23*($G$49<=$E23)*($G$50>=$F23),$H23*($G$49<=$F23)*($G$50>=$E23))
BD23: @IF($A23=1,$H23*($G$50<=$E23)*($G$51>=$F23),$H23*($G$50<=$F23)*($G$51>=$E23))
BE23: @IF($A23=1,$H23*($G$51<=$E23)*($G$52>=$F23),$H23*($G$51<=$F23)*($G$52>=$E23))
BF23: @IF($A23=1,$H23*($G$52<=$E23)*($G$53>=$F23),$H23*($G$52<=$F23)*($G$53>=$E23))
BG23: @IF($A23=1,$H23*($G$53<=$E23)*($G$54>=$F23),$H23*($G$53<=$F23)*($G$54>=$E23))
BH23: @IF($A23=1,$H23*($G$54<=$E23)*($G$55>=$F23),$H23*($G$54<=$F23)*($G$55>=$E23))
BI23: @IF($A23=1,$H23*($G$55<=$E23)*($G$56>=$F23),$H23*($G$55<=$F23)*($G$56>=$E23))
BJ23: @IF($A23=1,$H23*($G$56<=$E23)*($G$57>=$F23),$H23*($G$56<=$F23)*($G$57>=$E23))
BK23: @IF($A23=1,$H23*($G$57<=$E23)*($G$58>=$F23),$H23*($G$57<=$F23)*($G$58>=$E23))
BL23: @IF($A23=1,$H23*($G$58<=$E23)*($G$59>=$F23),$H23*($G$58<=$F23)*($G$59>=$E23))
BM23: @IF($A23=1,$H23*($G$59<=$E23)*($G$60>=$F23),$H23*($G$59<=$F23)*($G$60>=$E23))
BN23: @IF($A23=1,$H23*($G$60<=$E23)*($G$61>=$F23),$H23*($G$60<=$F23)*($G$61>=$E23))
BO23: @IF($A23=1,$H23*($G$61<=$E23)*($G$62>=$F23),$H23*($G$61<=$F23)*($G$62>=$E23))
BP23: @IF($A23=1,$H23*($G$62<=$E23)*($G$63>=$F23),$H23*($G$62<=$F23)*($G$63>=$E23))
BQ23: @IF($A23=1,$H23*($G$63<=$E23)*($G$64>=$F23),$H23*($G$63<=$F23)*($G$64>=$E23))
BR23: @IF($A23=1,$H23*($G$64<=$E23)*($G$65>=$F23),$H23*($G$64<=$F23)*($G$65>=$E23))
BS23: @IF($A23=1,$H23*($G$65<=$E23)*($G$66>=$F23),$H23*($G$65<=$F23)*($G$66>=$E23))
BT23: @IF($A23=1,$H23*($G$66<=$E23)*($G$67>=$F23),$H23*($G$66<=$F23)*($G$67>=$E23))
BU23: @IF($A23=1,$H23*($G$67<=$E23)*($G$68>=$F23),$H23*($G$67<=$F23)*($G$68>=$E23))
BV23: @IF($A23=1,$H23*($G$68<=$E23)*($G$69>=$F23),$H23*($G$68<=$F23)*($G$69>=$E23))
BW23: @IF($A23=1,$H23*($G$69<=$E23)*($G$70>=$F23),$H23*($G$69<=$F23)*($G$70>=$E23))
BX23: @IF($A23=1,$H23*($G$70<=$E23)*($G$71>=$F23),$H23*($G$70<=$F23)*($G$71>=$E23))
BY23: @IF($A23=1,$H23*($G$71<=$E23)*($G$72>=$F23),$H23*($G$71<=$F23)*($G$72>=$E23))
BZ23: @IF($A23=1,$H23*($G$72<=$E23)*($G$73>=$F23),$H23*($G$72<=$F23)*($G$73>=$E23))
P24: @IF($A24=1,$H24*($G$10<=$E24)*($G$11>=$F24),$H24*($G$10<=$F24)*($G$11>=$E24))
Q24: @IF($A24=1,$H24*($G$11<=$E24)*($G$12>=$F24),$H24*($G$11<=$F24)*($G$12>=$E24))
R24: @IF($A24=1,$H24*($G$12<=$E24)*($G$13>=$F24),$H24*($G$12<=$F24)*($G$13>=$E24))
S24: @IF($A24=1,$H24*($G$13<=$E24)*($G$14>=$F24),$H24*($G$13<=$F24)*($G$14>=$E24))
T24: @IF($A24=1,$H24*($G$14<=$E24)*($G$15>=$F24),$H24*($G$14<=$F24)*($G$15>=$E24))
U24: @IF($A24=1,$H24*($G$15<=$E24)*($G$16>=$F24),$H24*($G$15<=$F24)*($G$16>=$E24))
V24: @IF($A24=1,$H24*($G$16<=$E24)*($G$17>=$F24),$H24*($G$16<=$F24)*($G$17>=$E24))
W24: @IF($A24=1,$H24*($G$17<=$E24)*($G$18>=$F24),$H24*($G$17<=$F24)*($G$18>=$E24))
X24: @IF($A24=1,$H24*($G$18<=$E24)*($G$19>=$F24),$H24*($G$18<=$F24)*($G$19>=$E24))
Y24: @IF($A24=1,$H24*($G$19<=$E24)*($G$20>=$F24),$H24*($G$19<=$F24)*($G$20>=$E24))
Z24: @IF($A24=1,$H24*($G$20<=$E24)*($G$21>=$F24),$H24*($G$20<=$F24)*($G$21>=$E24))
AA24: @IF($A24=1,$H24*($G$21<=$E24)*($G$22>=$F24),$H24*($G$21<=$F24)*($G$22>=$E24))
AB24: @IF($A24=1,$H24*($G$22<=$E24)*($G$23>=$F24),$H24*($G$22<=$F24)*($G$23>=$E24))
AC24: @IF($A24=1,$H24*($G$23<=$E24)*($G$24>=$F24),$H24*($G$23<=$F24)*($G$24>=$E24))
AD24: @IF($A24=1,$H24*($G$24<=$E24)*($G$25>=$F24),$H24*($G$24<=$F24)*($G$25>=$E24))
AE24: @IF($A24=1,$H24*($G$25<=$E24)*($G$26>=$F24),$H24*($G$25<=$F24)*($G$26>=$E24))
AF24: @IF($A24=1,$H24*($G$26<=$E24)*($G$27>=$F24),$H24*($G$26<=$F24)*($G$27>=$E24))
AG24: @IF($A24=1,$H24*($G$27<=$E24)*($G$28>=$F24),$H24*($G$27<=$F24)*($G$28>=$E24))
AH24: @IF($A24=1,$H24*($G$28<=$E24)*($G$29>=$F24),$H24*($G$28<=$F24)*($G$29>=$E24))
AI24: @IF($A24=1,$H24*($G$29<=$E24)*($G$30>=$F24),$H24*($G$29<=$F24)*($G$30>=$E24))
AJ24: @IF($A24=1,$H24*($G$30<=$E24)*($G$31>=$F24),$H24*($G$30<=$F24)*($G$31>=$E24))
AK24: @IF($A24=1,$H24*($G$31<=$E24)*($G$32>=$F24),$H24*($G$31<=$F24)*($G$32>=$E24))
AL24: @IF($A24=1,$H24*($G$32<=$E24)*($G$33>=$F24),$H24*($G$32<=$F24)*($G$33>=$E24))
AM24: @IF($A24=1,$H24*($G$33<=$E24)*($G$34>=$F24),$H24*($G$33<=$F24)*($G$34>=$E24))
AN24: @IF($A24=1,$H24*($G$34<=$E24)*($G$35>=$F24),$H24*($G$34<=$F24)*($G$35>=$E24))
AO24: @IF($A24=1,$H24*($G$35<=$E24)*($G$36>=$F24),$H24*($G$35<=$F24)*($G$36>=$E24))
AP24: @IF($A24=1,$H24*($G$36<=$E24)*($G$37>=$F24),$H24*($G$36<=$F24)*($G$37>=$E24))
AQ24: @IF($A24=1,$H24*($G$37<=$E24)*($G$38>=$F24),$H24*($G$37<=$F24)*($G$38>=$E24))
AR24: @IF($A24=1,$H24*($G$38<=$E24)*($G$39>=$F24),$H24*($G$38<=$F24)*($G$39>=$E24))
AS24: @IF($A24=1,$H24*($G$39<=$E24)*($G$40>=$F24),$H24*($G$39<=$F24)*($G$40>=$E24))
AT24: @IF($A24=1,$H24*($G$40<=$E24)*($G$41>=$F24),$H24*($G$40<=$F24)*($G$41>=$E24))
AU24: @IF($A24=1,$H24*($G$41<=$E24)*($G$42>=$F24),$H24*($G$41<=$F24)*($G$42>=$E24))
```

```
AV24: @IF($A24=1,$H24*($G$42<=$E24)*($G$43>=$F24),$H24*($G$42<=$F24)*($G$43>=$E24))
AW24: @IF($A24=1,$H24*($G$43<=$E24)*($G$44>=$F24),$H24*($G$43<=$F24)*($G$44>=$E24))
AX24: @IF($A24=1,$H24*($G$44<=$E24)*($G$45>=$F24),$H24*($G$44<=$F24)*($G$45>=$E24))
AY24: @IF($A24=1,$H24*($G$45<=$E24)*($G$46>=$F24),$H24*($G$45<=$F24)*($G$46>=$E24))
AZ24: @IF($A24=1,$H24*($G$46<=$E24)*($G$47>=$F24),$H24*($G$46<=$F24)*($G$47>=$E24))
BA24: @IF($A24=1,$H24*($G$47<=$E24)*($G$48>=$F24),$H24*($G$47<=$F24)*($G$48>=$E24))
BB24: @IF($A24=1,$H24*($G$48<=$E24)*($G$49>=$F24),$H24*($G$48<=$F24)*($G$49>=$E24))
BC24: @IF($A24=1,$H24*($G$49<=$E24)*($G$50>=$F24),$H24*($G$49<=$F24)*($G$50>=$E24))
BD24: @IF($A24=1,$H24*($G$50<=$E24)*($G$51>=$F24),$H24*($G$50<=$F24)*($G$51>=$E24))
BE24: @IF($A24=1,$H24*($G$51<=$E24)*($G$52>=$F24),$H24*($G$51<=$F24)*($G$52>=$E24))
BF24: @IF($A24=1,$H24*($G$52<=$E24)*($G$53>=$F24),$H24*($G$52<=$F24)*($G$53>=$E24))
BG24: @IF($A24=1,$H24*($G$53<=$E24)*($G$54>=$F24),$H24*($G$53<=$F24)*($G$54>=$E24))
BH24: @IF($A24=1,$H24*($G$54<=$E24)*($G$55>=$F24),$H24*($G$54<=$F24)*($G$55>=$E24))
BI24: @IF($A24=1,$H24*($G$55<=$E24)*($G$56>=$F24),$H24*($G$55<=$F24)*($G$56>=$E24))
BJ24: @IF($A24=1,$H24*($G$56<=$E24)*($G$57>=$F24),$H24*($G$56<=$F24)*($G$57>=$E24))
BK24: @IF($A24=1,$H24*($G$57<=$E24)*($G$58>=$F24),$H24*($G$57<=$F24)*($G$58>=$E24))
BL24: @IF($A24=1,$H24*($G$58<=$E24)*($G$59>=$F24),$H24*($G$58<=$F24)*($G$59>=$E24))
BM24: @IF($A24=1,$H24*($G$59<=$E24)*($G$60>=$F24),$H24*($G$59<=$F24)*($G$60>=$E24))
BN24: @IF($A24=1,$H24*($G$60<=$E24)*($G$61>=$F24),$H24*($G$60<=$F24)*($G$61>=$E24))
BO24: @IF($A24=1,$H24*($G$61<=$E24)*($G$62>=$F24),$H24*($G$61<=$F24)*($G$62>=$E24))
BP24: @IF($A24=1,$H24*($G$62<=$E24)*($G$63>=$F24),$H24*($G$62<=$F24)*($G$63>=$E24))
BQ24: @IF($A24=1,$H24*($G$63<=$E24)*($G$64>=$F24),$H24*($G$63<=$F24)*($G$64>=$E24))
BR24: @IF($A24=1,$H24*($G$64<=$E24)*($G$65>=$F24),$H24*($G$64<=$F24)*($G$65>=$E24))
BS24: @IF($A24=1,$H24*($G$65<=$E24)*($G$66>=$F24),$H24*($G$65<=$F24)*($G$66>=$E24))
BT24: @IF($A24=1,$H24*($G$66<=$E24)*($G$67>=$F24),$H24*($G$66<=$F24)*($G$67>=$E24))
BU24: @IF($A24=1,$H24*($G$67<=$E24)*($G$68>=$F24),$H24*($G$67<=$F24)*($G$68>=$E24))
BV24: @IF($A24=1,$H24*($G$68<=$E24)*($G$69>=$F24),$H24*($G$68<=$F24)*($G$69>=$E24))
BW24: @IF($A24=1,$H24*($G$69<=$E24)*($G$70>=$F24),$H24*($G$69<=$F24)*($G$70>=$E24))
BX24: @IF($A24=1,$H24*($G$70<=$E24)*($G$71>=$F24),$H24*($G$70<=$F24)*($G$71>=$E24))
BY24: @IF($A24=1,$H24*($G$71<=$E24)*($G$72>=$F24),$H24*($G$71<=$F24)*($G$72>=$E24))
BZ24: @IF($A24=1,$H24*($G$72<=$E24)*($G$73>=$F24),$H24*($G$72<=$F24)*($G$73>=$E24))
P25: @IF($A25=1,$H25*($G$10<=$E25)*($G$11>=$F25),$H25*($G$10<=$F25)*($G$11>=$E25))
Q25: @IF($A25=1,$H25*($G$11<=$E25)*($G$12>=$F25),$H25*($G$11<=$F25)*($G$12>=$E25))
R25: @IF($A25=1,$H25*($G$12<=$E25)*($G$13>=$F25),$H25*($G$12<=$F25)*($G$13>=$E25))
S25: @IF($A25=1,$H25*($G$13<=$E25)*($G$14>=$F25),$H25*($G$13<=$F25)*($G$14>=$E25))
T25: @IF($A25=1,$H25*($G$14<=$E25)*($G$15>=$F25),$H25*($G$14<=$F25)*($G$15>=$E25))
U25: @IF($A25=1,$H25*($G$15<=$E25)*($G$16>=$F25),$H25*($G$15<=$F25)*($G$16>=$E25))
V25: @IF($A25=1,$H25*($G$16<=$E25)*($G$17>=$F25),$H25*($G$16<=$F25)*($G$17>=$E25))
W25: @IF($A25=1,$H25*($G$17<=$E25)*($G$18>=$F25),$H25*($G$17<=$F25)*($G$18>=$E25))
X25: @IF($A25=1,$H25*($G$18<=$E25)*($G$19>=$F25),$H25*($G$18<=$F25)*($G$19>=$E25))
Y25: @IF($A25=1,$H25*($G$19<=$E25)*($G$20>=$F25),$H25*($G$19<=$F25)*($G$20>=$E25))
Z25: @IF($A25=1,$H25*($G$20<=$E25)*($G$21>=$F25),$H25*($G$20<=$F25)*($G$21>=$E25))
AA25: @IF($A25=1,$H25*($G$21<=$E25)*($G$22>=$F25),$H25*($G$21<=$F25)*($G$22>=$E25))
AB25: @IF($A25=1,$H25*($G$22<=$E25)*($G$23>=$F25),$H25*($G$22<=$F25)*($G$23>=$E25))
AC25: @IF($A25=1,$H25*($G$23<=$E25)*($G$24>=$F25),$H25*($G$23<=$F25)*($G$24>=$E25))
AD25: @IF($A25=1,$H25*($G$24<=$E25)*($G$25>=$F25),$H25*($G$24<=$F25)*($G$25>=$E25))
AE25: @IF($A25=1,$H25*($G$25<=$E25)*($G$26>=$F25),$H25*($G$25<=$F25)*($G$26>=$E25))
AF25: @IF($A25=1,$H25*($G$26<=$E25)*($G$27>=$F25),$H25*($G$26<=$F25)*($G$27>=$E25))
AG25: @IF($A25=1,$H25*($G$27<=$E25)*($G$28>=$F25),$H25*($G$27<=$F25)*($G$28>=$E25))
AH25: @IF($A25=1,$H25*($G$28<=$E25)*($G$29>=$F25),$H25*($G$28<=$F25)*($G$29>=$E25))
AI25: @IF($A25=1,$H25*($G$29<=$E25)*($G$30>=$F25),$H25*($G$29<=$F25)*($G$30>=$E25))
AJ25: @IF($A25=1,$H25*($G$30<=$E25)*($G$31>=$F25),$H25*($G$30<=$F25)*($G$31>=$E25))
AK25: @IF($A25=1,$H25*($G$31<=$E25)*($G$32>=$F25),$H25*($G$31<=$F25)*($G$32>=$E25))
AL25: @IF($A25=1,$H25*($G$32<=$E25)*($G$33>=$F25),$H25*($G$32<=$F25)*($G$33>=$E25))
AM25: @IF($A25=1,$H25*($G$33<=$E25)*($G$34>=$F25),$H25*($G$33<=$F25)*($G$34>=$E25))
AN25: @IF($A25=1,$H25*($G$34<=$E25)*($G$35>=$F25),$H25*($G$34<=$F25)*($G$35>=$E25))
```

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AO25: @IF($A25=1,$H25*($G$35<=$E25)*($G$36>=$F25),$H25*($G$35<=$F25)*($G$36>=$E25))
AP25: @IF($A25=1,$H25*($G$36<=$E25)*($G$37>=$F25),$H25*($G$36<=$F25)*($G$37>=$E25))
AQ25: @IF($A25=1,$H25*($G$37<=$E25)*($G$38>=$F25),$H25*($G$37<=$F25)*($G$38>=$E25))
AR25: @IF($A25=1,$H25*($G$38<=$E25)*($G$39>=$F25),$H25*($G$38<=$F25)*($G$39>=$E25))
AS25: @IF($A25=1,$H25*($G$39<=$E25)*($G$40>=$F25),$H25*($G$39<=$F25)*($G$40>=$E25))
AT25: @IF($A25=1,$H25*($G$40<=$E25)*($G$41>=$F25),$H25*($G$40<=$F25)*($G$41>=$E25))
AU25: @IF($A25=1,$H25*($G$41<=$E25)*($G$42>=$F25),$H25*($G$41<=$F25)*($G$42>=$E25))
AV25: @IF($A25=1,$H25*($G$42<=$E25)*($G$43>=$F25),$H25*($G$42<=$F25)*($G$43>=$E25))
AW25: @IF($A25=1,$H25*($G$43<=$E25)*($G$44>=$F25),$H25*($G$43<=$F25)*($G$44>=$E25))
AX25: @IF($A25=1,$H25*($G$44<=$E25)*($G$45>=$F25),$H25*($G$44<=$F25)*($G$45>=$E25))
AY25: @IF($A25=1,$H25*($G$45<=$E25)*($G$46>=$F25),$H25*($G$45<=$F25)*($G$46>=$E25))
AZ25: @IF($A25=1,$H25*($G$46<=$E25)*($G$47>=$F25),$H25*($G$46<=$F25)*($G$47>=$E25))
BA25: @IF($A25=1,$H25*($G$47<=$E25)*($G$48>=$F25),$H25*($G$47<=$F25)*($G$48>=$E25))
BB25: @IF($A25=1,$H25*($G$48<=$E25)*($G$49>=$F25),$H25*($G$48<=$F25)*($G$49>=$E25))
BC25: @IF($A25=1,$H25*($G$49<=$E25)*($G$50>=$F25),$H25*($G$49<=$F25)*($G$50>=$E25))
BD25: @IF($A25=1,$H25*($G$50<=$E25)*($G$51>=$F25),$H25*($G$50<=$F25)*($G$51>=$E25))
BE25: @IF($A25=1,$H25*($G$51<=$E25)*($G$52>=$F25),$H25*($G$51<=$F25)*($G$52>=$E25))
BF25: @IF($A25=1,$H25*($G$52<=$E25)*($G$53>=$F25),$H25*($G$52<=$F25)*($G$53>=$E25))
BG25: @IF($A25=1,$H25*($G$53<=$E25)*($G$54>=$F25),$H25*($G$53<=$F25)*($G$54>=$E25))
BH25: @IF($A25=1,$H25*($G$54<=$E25)*($G$55>=$F25),$H25*($G$54<=$F25)*($G$55>=$E25))
BI25: @IF($A25=1,$H25*($G$55<=$E25)*($G$56>=$F25),$H25*($G$55<=$F25)*($G$56>=$E25))
BJ25: @IF($A25=1,$H25*($G$56<=$E25)*($G$57>=$F25),$H25*($G$56<=$F25)*($G$57>=$E25))
BK25: @IF($A25=1,$H25*($G$57<=$E25)*($G$58>=$F25),$H25*($G$57<=$F25)*($G$58>=$E25))
BL25: @IF($A25=1,$H25*($G$58<=$E25)*($G$59>=$F25),$H25*($G$58<=$F25)*($G$59>=$E25))
BM25: @IF($A25=1,$H25*($G$59<=$E25)*($G$60>=$F25),$H25*($G$59<=$F25)*($G$60>=$E25))
BN25: @IF($A25=1,$H25*($G$60<=$E25)*($G$61>=$F25),$H25*($G$60<=$F25)*($G$61>=$E25))
BO25: @IF($A25=1,$H25*($G$61<=$E25)*($G$62>=$F25),$H25*($G$61<=$F25)*($G$62>=$E25))
BP25: @IF($A25=1,$H25*($G$62<=$E25)*($G$63>=$F25),$H25*($G$62<=$F25)*($G$63>=$E25))
BQ25: @IF($A25=1,$H25*($G$63<=$E25)*($G$64>=$F25),$H25*($G$63<=$F25)*($G$64>=$E25))
BR25: @IF($A25=1,$H25*($G$64<=$E25)*($G$65>=$F25),$H25*($G$64<=$F25)*($G$65>=$E25))
BS25: @IF($A25=1,$H25*($G$65<=$E25)*($G$66>=$F25),$H25*($G$65<=$F25)*($G$66>=$E25))
BT25: @IF($A25=1,$H25*($G$66<=$E25)*($G$67>=$F25),$H25*($G$66<=$F25)*($G$67>=$E25))
BU25: @IF($A25=1,$H25*($G$67<=$E25)*($G$68>=$F25),$H25*($G$67<=$F25)*($G$68>=$E25))
BV25: @IF($A25=1,$H25*($G$68<=$E25)*($G$69>=$F25),$H25*($G$68<=$F25)*($G$69>=$E25))
BW25: @IF($A25=1,$H25*($G$69<=$E25)*($G$70>=$F25),$H25*($G$69<=$F25)*($G$70>=$E25))
BX25: @IF($A25=1,$H25*($G$70<=$E25)*($G$71>=$F25),$H25*($G$70<=$F25)*($G$71>=$E25))
BY25: @IF($A25=1,$H25*($G$71<=$E25)*($G$72>=$F25),$H25*($G$71<=$F25)*($G$72>=$E25))
BZ25: @IF($A25=1,$H25*($G$72<=$E25)*($G$73>=$F25),$H25*($G$72<=$F25)*($G$73>=$E25))
P26: @IF($A26=1,$H26*($G$10<=$E26)*($G$11>=$F26),$H26*($G$10<=$F26)*($G$11>=$E26))
Q26: @IF($A26=1,$H26*($G$11<=$E26)*($G$12>=$F26),$H26*($G$11<=$F26)*($G$12>=$E26))
R26: @IF($A26=1,$H26*($G$12<=$E26)*($G$13>=$F26),$H26*($G$12<=$F26)*($G$13>=$E26))
S26: @IF($A26=1,$H26*($G$13<=$E26)*($G$14>=$F26),$H26*($G$13<=$F26)*($G$14>=$E26))
T26: @IF($A26=1,$H26*($G$14<=$E26)*($G$15>=$F26),$H26*($G$14<=$F26)*($G$15>=$E26))
U26: @IF($A26=1,$H26*($G$15<=$E26)*($G$16>=$F26),$H26*($G$15<=$F26)*($G$16>=$E26))
V26: @IF($A26=1,$H26*($G$16<=$E26)*($G$17>=$F26),$H26*($G$16<=$F26)*($G$17>=$E26))
W26: @IF($A26=1,$H26*($G$17<=$E26)*($G$18>=$F26),$H26*($G$17<=$F26)*($G$18>=$E26))
X26: @IF($A26=1,$H26*($G$18<=$E26)*($G$19>=$F26),$H26*($G$18<=$F26)*($G$19>=$E26))
Y26: @IF($A26=1,$H26*($G$19<=$E26)*($G$20>=$F26),$H26*($G$19<=$F26)*($G$20>=$E26))
Z26: @IF($A26=1,$H26*($G$20<=$E26)*($G$21>=$F26),$H26*($G$20<=$F26)*($G$21>=$E26))
AA26: @IF($A26=1,$H26*($G$21<=$E26)*($G$22>=$F26),$H26*($G$21<=$F26)*($G$22>=$E26))
AB26: @IF($A26=1,$H26*($G$22<=$E26)*($G$23>=$F26),$H26*($G$22<=$F26)*($G$23>=$E26))
AC26: @IF($A26=1,$H26*($G$23<=$E26)*($G$24>=$F26),$H26*($G$23<=$F26)*($G$24>=$E26))
AD26: @IF($A26=1,$H26*($G$24<=$E26)*($G$25>=$F26),$H26*($G$24<=$F26)*($G$25>=$E26))
AE26: @IF($A26=1,$H26*($G$25<=$E26)*($G$26>=$F26),$H26*($G$25<=$F26)*($G$26>=$E26))
AF26: @IF($A26=1,$H26*($G$26<=$E26)*($G$27>=$F26),$H26*($G$26<=$F26)*($G$27>=$E26))
AG26: @IF($A26=1,$H26*($G$27<=$E26)*($G$28>=$F26),$H26*($G$27<=$F26)*($G$28>=$E26))
```

```
AH26: @IF($A26=1,$H26*($G$28<=$E26)*($G$29>=$F26),$H26*($G$28<=$F26)*($G$29>=$E26))
AI26: @IF($A26=1,$H26*($G$29<=$E26)*($G$30>=$F26),$H26*($G$29<=$F26)*($G$30>=$E26))
AJ26: @IF($A26=1,$H26*($G$30<=$E26)*($G$31>=$F26),$H26*($G$30<=$F26)*($G$31>=$E26))
AK26: @IF($A26=1,$H26*($G$31<=$E26)*($G$32>=$F26),$H26*($G$31<=$F26)*($G$32>=$E26))
AL26: @IF($A26=1,$H26*($G$32<=$E26)*($G$33>=$F26),$H26*($G$32<=$F26)*($G$33>=$E26))
AM26: @IF($A26=1,$H26*($G$33<=$E26)*($G$34>=$F26),$H26*($G$33<=$F26)*($G$34>=$E26))
AN26: @IF($A26=1,$H26*($G$34<=$E26)*($G$35>=$F26),$H26*($G$34<=$F26)*($G$35>=$E26))
AO26: @IF($A26=1,$H26*($G$35<=$E26)*($G$36>=$F26),$H26*($G$35<=$F26)*($G$36>=$E26))
AP26: @IF($A26=1,$H26*($G$36<=$E26)*($G$37>=$F26),$H26*($G$36<=$F26)*($G$37>=$E26))
AQ26: @IF($A26=1,$H26*($G$37<=$E26)*($G$38>=$F26),$H26*($G$37<=$F26)*($G$38>=$E26))
AR26: @IF($A26=1,$H26*($G$38<=$E26)*($G$39>=$F26),$H26*($G$38<=$F26)*($G$39>=$E26))
AS26: @IF($A26=1,$H26*($G$39<=$E26)*($G$40>=$F26),$H26*($G$39<=$F26)*($G$40>=$E26))
AT26: @IF($A26=1,$H26*($G$40<=$E26)*($G$41>=$F26),$H26*($G$40<=$F26)*($G$41>=$E26))
AU26: @IF($A26=1,$H26*($G$41<=$E26)*($G$42>=$F26),$H26*($G$41<=$F26)*($G$42>=$E26))
AV26: @IF($A26=1,$H26*($G$42<=$E26)*($G$43>=$F26),$H26*($G$42<=$F26)*($G$43>=$E26))
AW26: @IF($A26=1,$H26*($G$43<=$E26)*($G$44>=$F26),$H26*($G$43<=$F26)*($G$44>=$E26))
AX26: @IF($A26=1,$H26*($G$44<=$E26)*($G$45>=$F26),$H26*($G$44<=$F26)*($G$45>=$E26))
AY26: @IF($A26=1,$H26*($G$45<=$E26)*($G$46>=$F26),$H26*($G$45<=$F26)*($G$46>=$E26))
AZ26: @IF($A26=1,$H26*($G$46<=$E26)*($G$47>=$F26),$H26*($G$46<=$F26)*($G$47>=$E26))
BA26: @IF($A26=1,$H26*($G$47<=$E26)*($G$48>=$F26),$H26*($G$47<=$F26)*($G$48>=$E26))
BB26: @IF($A26=1,$H26*($G$48<=$E26)*($G$49>=$F26),$H26*($G$48<=$F26)*($G$49>=$E26))
BC26: @IF($A26=1,$H26*($G$49<=$E26)*($G$50>=$F26),$H26*($G$49<=$F26)*($G$50>=$E26))
BD26: @IF($A26=1,$H26*($G$50<=$E26)*($G$51>=$F26),$H26*($G$50<=$F26)*($G$51>=$E26))
BE26: @IF($A26=1,$H26*($G$51<=$E26)*($G$52>=$F26),$H26*($G$51<=$F26)*($G$52>=$E26))
BF26: @IF($A26=1,$H26*($G$52<=$E26)*($G$53>=$F26),$H26*($G$52<=$F26)*($G$53>=$E26))
BG26: @IF($A26=1,$H26*($G$53<=$E26)*($G$54>=$F26),$H26*($G$53<=$F26)*($G$54>=$E26))
BH26: @IF($A26=1,$H26*($G$54<=$E26)*($G$55>=$F26),$H26*($G$54<=$F26)*($G$55>=$E26))
BI26: @IF($A26=1,$H26*($G$55<=$E26)*($G$56>=$F26),$H26*($G$55<=$F26)*($G$56>=$E26))
BJ26: @IF($A26=1,$H26*($G$56<=$E26)*($G$57>=$F26),$H26*($G$56<=$F26)*($G$57>=$E26))
BK26: @IF($A26=1,$H26*($G$57<=$E26)*($G$58>=$F26),$H26*($G$57<=$F26)*($G$58>=$E26))
BL26: @IF($A26=1,$H26*($G$58<=$E26)*($G$59>=$F26),$H26*($G$58<=$F26)*($G$59>=$E26))
BM26: @IF($A26=1,$H26*($G$59<=$E26)*($G$60>=$F26),$H26*($G$59<=$F26)*($G$60>=$E26))
BN26: @IF($A26=1,$H26*($G$60<=$E26)*($G$61>=$F26),$H26*($G$60<=$F26)*($G$61>=$E26))
BO26: @IF($A26=1,$H26*($G$61<=$E26)*($G$62>=$F26),$H26*($G$61<=$F26)*($G$62>=$E26))
BP26: @IF($A26=1,$H26*($G$62<=$E26)*($G$63>=$F26),$H26*($G$62<=$F26)*($G$63>=$E26))
BQ26: @IF($A26=1,$H26*($G$63<=$E26)*($G$64>=$F26),$H26*($G$63<=$F26)*($G$64>=$E26))
BR26: @IF($A26=1,$H26*($G$64<=$E26)*($G$65>=$F26),$H26*($G$64<=$F26)*($G$65>=$E26))
BS26: @IF($A26=1,$H26*($G$65<=$E26)*($G$66>=$F26),$H26*($G$65<=$F26)*($G$66>=$E26))
BT26: @IF($A26=1,$H26*($G$66<=$E26)*($G$67>=$F26),$H26*($G$66<=$F26)*($G$67>=$E26))
BU26: @IF($A26=1,$H26*($G$67<=$E26)*($G$68>=$F26),$H26*($G$67<=$F26)*($G$68>=$E26))
BV26: @IF($A26=1,$H26*($G$68<=$E26)*($G$69>=$F26),$H26*($G$68<=$F26)*($G$69>=$E26))
BW26: @IF($A26=1,$H26*($G$69<=$E26)*($G$70>=$F26),$H26*($G$69<=$F26)*($G$70>=$E26))
BX26: @IF($A26=1,$H26*($G$70<=$E26)*($G$71>=$F26),$H26*($G$70<=$F26)*($G$71>=$E26))
BY26: @IF($A26=1,$H26*($G$71<=$E26)*($G$72>=$F26),$H26*($G$71<=$F26)*($G$72>=$E26))
BZ26: @IF($A26=1,$H26*($G$72<=$E26)*($G$73>=$F26),$H26*($G$72<=$F26)*($G$73>=$E26))
P27: @IF($A27=1,$H27*($G$10<=$E27)*($G$11>=$F27),$H27*($G$10<=$F27)*($G$11>=$E27))
Q27: @IF($A27=1,$H27*($G$11<=$E27)*($G$12>=$F27),$H27*($G$11<=$F27)*($G$12>=$E27))
R27: @IF($A27=1,$H27*($G$12<=$E27)*($G$13>=$F27),$H27*($G$12<=$F27)*($G$13>=$E27))
S27: @IF($A27=1,$H27*($G$13<=$E27)*($G$14>=$F27),$H27*($G$13<=$F27)*($G$14>=$E27))
T27: @IF($A27=1,$H27*($G$14<=$E27)*($G$15>=$F27),$H27*($G$14<=$F27)*($G$15>=$E27))
U27: @IF($A27=1,$H27*($G$15<=$E27)*($G$16>=$F27),$H27*($G$15<=$F27)*($G$16>=$E27))
V27: @IF($A27=1,$H27*($G$16<=$E27)*($G$17>=$F27),$H27*($G$16<=$F27)*($G$17>=$E27))
W27: @IF($A27=1,$H27*($G$17<=$E27)*($G$18>=$F27),$H27*($G$17<=$F27)*($G$18>=$E27))
X27: @IF($A27=1,$H27*($G$18<=$E27)*($G$19>=$F27),$H27*($G$18<=$F27)*($G$19>=$E27))
Y27: @IF($A27=1,$H27*($G$19<=$E27)*($G$20>=$F27),$H27*($G$19<=$F27)*($G$20>=$E27))
Z27: @IF($A27=1,$H27*($G$20<=$E27)*($G$21>=$F27),$H27*($G$20<=$F27)*($G$21>=$E27))
```

```
AA27: @IF($A27=1,$H27*($G$21<=$E27)*($G$22>=$F27),$H27*($G$21<=$F27)*($G$22>=$E27))
AB27: @IF($A27=1,$H27*($G$22<=$E27)*($G$23>=$F27),$H27*($G$22<=$F27)*($G$23>=$E27))
AC27: @IF($A27=1,$H27*($G$23<=$E27)*($G$24>=$F27),$H27*($G$23<=$F27)*($G$24>=$E27))
AD27: @IF($A27=1,$H27*($G$24<=$E27)*($G$25>=$F27),$H27*($G$24<=$F27)*($G$25>=$E27))
AE27: @IF($A27=1,$H27*($G$25<=$E27)*($G$26>=$F27),$H27*($G$25<=$F27)*($G$26>=$E27))
AF27: @IF($A27=1,$H27*($G$26<=$E27)*($G$27>=$F27),$H27*($G$26<=$F27)*($G$27>=$E27))
AG27: @IF($A27=1,$H27*($G$27<=$E27)*($G$28>=$F27),$H27*($G$27<=$F27)*($G$28>=$E27))
AH27: @IF($A27=1,$H27*($G$28<=$E27)*($G$29>=$F27),$H27*($G$28<=$F27)*($G$29>=$E27))
AI27: @IF($A27=1,$H27*($G$29<=$E27)*($G$30>=$F27),$H27*($G$29<=$F27)*($G$30>=$E27))
AJ27: @IF($A27=1,$H27*($G$30<=$E27)*($G$31>=$F27),$H27*($G$30<=$F27)*($G$31>=$E27))
AK27: @IF($A27=1,$H27*($G$31<=$E27)*($G$32>=$F27),$H27*($G$31<=$F27)*($G$32>=$E27))
AL27: @IF($A27=1,$H27*($G$32<=$E27)*($G$33>=$F27),$H27*($G$32<=$F27)*($G$33>=$E27))
AM27: @IF($A27=1,$H27*($G$33<=$E27)*($G$34>=$F27),$H27*($G$33<=$F27)*($G$34>=$E27))
AN27: @IF($A27=1,$H27*($G$34<=$E27)*($G$35>=$F27),$H27*($G$34<=$F27)*($G$35>=$E27))
AO27: @IF($A27=1,$H27*($G$35<=$E27)*($G$36>=$F27),$H27*($G$35<=$F27)*($G$36>=$E27))
AP27: @IF($A27=1,$H27*($G$36<=$E27)*($G$37>=$F27),$H27*($G$36<=$F27)*($G$37>=$E27))
AQ27: @IF($A27=1,$H27*($G$37<=$E27)*($G$38>=$F27),$H27*($G$37<=$F27)*($G$38>=$E27))
AR27: @IF($A27=1,$H27*($G$38<=$E27)*($G$39>=$F27),$H27*($G$38<=$F27)*($G$39>=$E27))
AS27: @IF($A27=1,$H27*($G$39<=$E27)*($G$40>=$F27),$H27*($G$39<=$F27)*($G$40>=$E27))
AT27: @IF($A27=1,$H27*($G$40<=$E27)*($G$41>=$F27),$H27*($G$40<=$F27)*($G$41>=$E27))
AU27: @IF($A27=1,$H27*($G$41<=$E27)*($G$42>=$F27),$H27*($G$41<=$F27)*($G$42>=$E27))
AV27: @IF($A27=1,$H27*($G$42<=$E27)*($G$43>=$F27),$H27*($G$42<=$F27)*($G$43>=$E27))
AW27: @IF($A27=1,$H27*($G$43<=$E27)*($G$44>=$F27),$H27*($G$43<=$F27)*($G$44>=$E27))
AX27: @IF($A27=1,$H27*($G$44<=$E27)*($G$45>=$F27),$H27*($G$44<=$F27)*($G$45>=$E27))
AY27: @IF($A27=1,$H27*($G$45<=$E27)*($G$46>=$F27),$H27*($G$45<=$F27)*($G$46>=$E27))
AZ27: @IF($A27=1,$H27*($G$46<=$E27)*($G$47>=$F27),$H27*($G$46<=$F27)*($G$47>=$E27))
BA27: @IF($A27=1,$H27*($G$47<=$E27)*($G$48>=$F27),$H27*($G$47<=$F27)*($G$48>=$E27))
BB27: @IF($A27=1,$H27*($G$48<=$E27)*($G$49>=$F27),$H27*($G$48<=$F27)*($G$49>=$E27))
BC27: @IF($A27=1,$H27*($G$49<=$E27)*($G$50>=$F27),$H27*($G$49<=$F27)*($G$50>=$E27))
BD27: @IF($A27=1,$H27*($G$50<=$E27)*($G$51>=$F27),$H27*($G$50<=$F27)*($G$51>=$E27))
BE27: @IF($A27=1,$H27*($G$51<=$E27)*($G$52>=$F27),$H27*($G$51<=$F27)*($G$52>=$E27))
BF27: @IF($A27=1,$H27*($G$52<=$E27)*($G$53>=$F27),$H27*($G$52<=$F27)*($G$53>=$E27))
BG27: @IF($A27=1,$H27*($G$53<=$E27)*($G$54>=$F27),$H27*($G$53<=$F27)*($G$54>=$E27))
BH27: @IF($A27=1,$H27*($G$54<=$E27)*($G$55>=$F27),$H27*($G$54<=$F27)*($G$55>=$E27))
BI27: @IF($A27=1,$H27*($G$55<=$E27)*($G$56>=$F27),$H27*($G$55<=$F27)*($G$56>=$E27))
BJ27: @IF($A27=1,$H27*($G$56<=$E27)*($G$57>=$F27),$H27*($G$56<=$F27)*($G$57>=$E27))
BK27: @IF($A27=1,$H27*($G$57<=$E27)*($G$58>=$F27),$H27*($G$57<=$F27)*($G$58>=$E27))
BL27: @IF($A27=1,$H27*($G$58<=$E27)*($G$59>=$F27),$H27*($G$58<=$F27)*($G$59>=$E27))
BM27: @IF($A27=1,$H27*($G$59<=$E27)*($G$60>=$F27),$H27*($G$59<=$F27)*($G$60>=$E27))
BN27: @IF($A27=1,$H27*($G$60<=$E27)*($G$61>=$F27),$H27*($G$60<=$F27)*($G$61>=$E27))
BO27: @IF($A27=1,$H27*($G$61<=$E27)*($G$62>=$F27),$H27*($G$61<=$F27)*($G$62>=$E27))
BP27: @IF($A27=1,$H27*($G$62<=$E27)*($G$63>=$F27),$H27*($G$62<=$F27)*($G$63>=$E27))
BQ27: @IF($A27=1,$H27*($G$63<=$E27)*($G$64>=$F27),$H27*($G$63<=$F27)*($G$64>=$E27))
BR27: @IF($A27=1,$H27*($G$64<=$E27)*($G$65>=$F27),$H27*($G$64<=$F27)*($G$65>=$E27))
BS27: @IF($A27=1,$H27*($G$65<=$E27)*($G$66>=$F27),$H27*($G$65<=$F27)*($G$66>=$E27))
BT27: @IF($A27=1,$H27*($G$66<=$E27)*($G$67>=$F27),$H27*($G$66<=$F27)*($G$67>=$E27))
BU27: @IF($A27=1,$H27*($G$67<=$E27)*($G$68>=$F27),$H27*($G$67<=$F27)*($G$68>=$E27))
BV27: @IF($A27=1,$H27*($G$68<=$E27)*($G$69>=$F27),$H27*($G$68<=$F27)*($G$69>=$E27))
BW27: @IF($A27=1,$H27*($G$69<=$E27)*($G$70>=$F27),$H27*($G$69<=$F27)*($G$70>=$E27))
BX27: @IF($A27=1,$H27*($G$70<=$E27)*($G$71>=$F27),$H27*($G$70<=$F27)*($G$71>=$E27))
BY27: @IF($A27=1,$H27*($G$71<=$E27)*($G$72>=$F27),$H27*($G$71<=$F27)*($G$72>=$E27))
BZ27: @IF($A27=1,$H27*($G$72<=$E27)*($G$73>=$F27),$H27*($G$72<=$F27)*($G$73>=$E27))
P28: @IF($A28=1,$H28*($G$10<=$E28)*($G$11>=$F28),$H28*($G$10<=$F28)*($G$11>=$E28))
Q28: @IF($A28=1,$H28*($G$11<=$E28)*($G$12>=$F28),$H28*($G$11<=$F28)*($G$12>=$E28))
R28: @IF($A28=1,$H28*($G$12<=$E28)*($G$13>=$F28),$H28*($G$12<=$F28)*($G$13>=$E28))
S28: @IF($A28=1,$H28*($G$13<=$E28)*($G$14>=$F28),$H28*($G$13<=$F28)*($G$14>=$E28))
```

```
T28: @IF($A28=1,$H28*($G$14<=$E28)*($G$15>=$F28),$H28*($G$14<=$F28)*($G$15>=$E28))
U28: @IF($A28=1,$H28*($G$15<=$E28)*($G$16>=$F28),$H28*($G$15<=$F28)*($G$16>=$E28))
V28: @IF($A28=1,$H28*($G$16<=$E28)*($G$17>=$F28),$H28*($G$16<=$F28)*($G$17>=$E28))
W28: @IF($A28=1,$H28*($G$17<=$E28)*($G$18>=$F28),$H28*($G$17<=$F28)*($G$18>=$E28))
X28: @IF($A28=1,$H28*($G$18<=$E28)*($G$19>=$F28),$H28*($G$18<=$F28)*($G$19>=$E28))
Y28: @IF($A28=1,$H28*($G$19<=$E28)*($G$20>=$F28),$H28*($G$19<=$F28)*($G$20>=$E28))
Z28: @IF($A28=1,$H28*($G$20<=$E28)*($G$21>=$F28),$H28*($G$20<=$F28)*($G$21>=$E28))
AA28: @IF($A28=1,$H28*($G$21<=$E28)*($G$22>=$F28),$H28*($G$21<=$F28)*($G$22>=$E28))
AB28: @IF($A28=1,$H28*($G$22<=$E28)*($G$23>=$F28),$H28*($G$22<=$F28)*($G$23>=$E28))
AC28: @IF($A28=1,$H28*($G$23<=$E28)*($G$24>=$F28),$H28*($G$23<=$F28)*($G$24>=$E28))
AD28: @IF($A28=1,$H28*($G$24<=$E28)*($G$25>=$F28),$H28*($G$24<=$F28)*($G$25>=$E28))
AE28: @IF($A28=1,$H28*($G$25<=$E28)*($G$26>=$F28),$H28*($G$25<=$F28)*($G$26>=$E28))
AF28: @IF($A28=1,$H28*($G$26<=$E28)*($G$27>=$F28),$H28*($G$26<=$F28)*($G$27>=$E28))
AG28: @IF($A28=1,$H28*($G$27<=$E28)*($G$28>=$F28),$H28*($G$27<=$F28)*($G$28>=$E28))
AH28: @IF($A28=1,$H28*($G$28<=$E28)*($G$29>=$F28),$H28*($G$28<=$F28)*($G$29>=$E28))
AI28: @IF($A28=1,$H28*($G$29<=$E28)*($G$30>=$F28),$H28*($G$29<=$F28)*($G$30>=$E28))
AJ28: @IF($A28=1,$H28*($G$30<=$E28)*($G$31>=$F28),$H28*($G$30<=$F28)*($G$31>=$E28))
AK28: @IF($A28=1,$H28*($G$31<=$E28)*($G$32>=$F28),$H28*($G$31<=$F28)*($G$32>=$E28))
AL28: @IF($A28=1,$H28*($G$32<=$E28)*($G$33>=$F28),$H28*($G$32<=$F28)*($G$33>=$E28))
AM28: @IF($A28=1,$H28*($G$33<=$E28)*($G$34>=$F28),$H28*($G$33<=$F28)*($G$34>=$E28))
AN28: @IF($A28=1,$H28*($G$34<=$E28)*($G$35>=$F28),$H28*($G$34<=$F28)*($G$35>=$E28))
AO28: @IF($A28=1,$H28*($G$35<=$E28)*($G$36>=$F28),$H28*($G$35<=$F28)*($G$36>=$E28))
AP28: @IF($A28=1,$H28*($G$36<=$E28)*($G$37>=$F28),$H28*($G$36<=$F28)*($G$37>=$E28))
AQ28: @IF($A28=1,$H28*($G$37<=$E28)*($G$38>=$F28),$H28*($G$37<=$F28)*($G$38>=$E28))
AR28: @IF($A28=1,$H28*($G$38<=$E28)*($G$39>=$F28),$H28*($G$38<=$F28)*($G$39>=$E28))
AS28: @IF($A28=1,$H28*($G$39<=$E28)*($G$40>=$F28),$H28*($G$39<=$F28)*($G$40>=$E28))
AT28: @IF($A28=1,$H28*($G$40<=$E28)*($G$41>=$F28),$H28*($G$40<=$F28)*($G$41>=$E28))
AU28: @IF($A28=1,$H28*($G$41<=$E28)*($G$42>=$F28),$H28*($G$41<=$F28)*($G$42>=$E28))
AV28: @IF($A28=1,$H28*($G$42<=$E28)*($G$43>=$F28),$H28*($G$42<=$F28)*($G$43>=$E28))
AW28: @IF($A28=1,$H28*($G$43<=$E28)*($G$44>=$F28),$H28*($G$43<=$F28)*($G$44>=$E28))
AX28: @IF($A28=1,$H28*($G$44<=$E28)*($G$45>=$F28),$H28*($G$44<=$F28)*($G$45>=$E28))
AY28: @IF($A28=1,$H28*($G$45<=$E28)*($G$46>=$F28),$H28*($G$45<=$F28)*($G$46>=$E28))
AZ28: @IF($A28=1,$H28*($G$46<=$E28)*($G$47>=$F28),$H28*($G$46<=$F28)*($G$47>=$E28))
BA28: @IF($A28=1,$H28*($G$47<=$E28)*($G$48>=$F28),$H28*($G$47<=$F28)*($G$48>=$E28))
BB28: @IF($A28=1,$H28*($G$48<=$E28)*($G$49>=$F28),$H28*($G$48<=$F28)*($G$49>=$E28))
BC28: @IF($A28=1,$H28*($G$49<=$E28)*($G$50>=$F28),$H28*($G$49<=$F28)*($G$50>=$E28))
BD28: @IF($A28=1,$H28*($G$50<=$E28)*($G$51>=$F28),$H28*($G$50<=$F28)*($G$51>=$E28))
BE28: @IF($A28=1,$H28*($G$51<=$E28)*($G$52>=$F28),$H28*($G$51<=$F28)*($G$52>=$E28))
BF28: @IF($A28=1,$H28*($G$52<=$E28)*($G$53>=$F28),$H28*($G$52<=$F28)*($G$53>=$E28))
BG28: @IF($A28=1,$H28*($G$53<=$E28)*($G$54>=$F28),$H28*($G$53<=$F28)*($G$54>=$E28))
BH28: @IF($A28=1,$H28*($G$54<=$E28)*($G$55>=$F28),$H28*($G$54<=$F28)*($G$55>=$E28))
BI28: @IF($A28=1,$H28*($G$55<=$E28)*($G$56>=$F28),$H28*($G$55<=$F28)*($G$56>=$E28))
BJ28: @IF($A28=1,$H28*($G$56<=$E28)*($G$57>=$F28),$H28*($G$56<=$F28)*($G$57>=$E28))
BK28: @IF($A28=1,$H28*($G$57<=$E28)*($G$58>=$F28),$H28*($G$57<=$F28)*($G$58>=$E28))
BL28: @IF($A28=1,$H28*($G$58<=$E28)*($G$59>=$F28),$H28*($G$58<=$F28)*($G$59>=$E28))
BM28: @IF($A28=1,$H28*($G$59<=$E28)*($G$60>=$F28),$H28*($G$59<=$F28)*($G$60>=$E28))
BN28: @IF($A28=1,$H28*($G$60<=$E28)*($G$61>=$F28),$H28*($G$60<=$F28)*($G$61>=$E28))
BO28: @IF($A28=1,$H28*($G$61<=$E28)*($G$62>=$F28),$H28*($G$61<=$F28)*($G$62>=$E28))
BP28: @IF($A28=1,$H28*($G$62<=$E28)*($G$63>=$F28),$H28*($G$62<=$F28)*($G$63>=$E28))
BQ28: @IF($A28=1,$H28*($G$63<=$E28)*($G$64>=$F28),$H28*($G$63<=$F28)*($G$64>=$E28))
BR28: @IF($A28=1,$H28*($G$64<=$E28)*($G$65>=$F28),$H28*($G$64<=$F28)*($G$65>=$E28))
BS28: @IF($A28=1,$H28*($G$65<=$E28)*($G$66>=$F28),$H28*($G$65<=$F28)*($G$66>=$E28))
BT28: @IF($A28=1,$H28*($G$66<=$E28)*($G$67>=$F28),$H28*($G$66<=$F28)*($G$67>=$E28))
BU28: @IF($A28=1,$H28*($G$67<=$E28)*($G$68>=$F28),$H28*($G$67<=$F28)*($G$68>=$E28))
BV28: @IF($A28=1,$H28*($G$68<=$E28)*($G$69>=$F28),$H28*($G$68<=$F28)*($G$69>=$E28))
BW28: @IF($A28=1,$H28*($G$69<=$E28)*($G$70>=$F28),$H28*($G$69<=$F28)*($G$70>=$E28))
```

```
BX28: @IF($A28=1,$H28*($G$70<=$E28)*($G$71>=$F28),$H28*($G$70<=$F28)*($G$71>=$E28))
BY28: @IF($A28=1,$H28*($G$71<=$E28)*($G$72>=$F28),$H28*($G$71<=$F28)*($G$72>=$E28))
BZ28: @IF($A28=1,$H28*($G$72<=$E28)*($G$73>=$F28),$H28*($G$72<=$F28)*($G$73>=$E28))
P29: @IF($A29=1,$H29*($G$10<=$E29)*($G$11>=$F29),$H29*($G$10<=$F29)*($G$11>=$E29))
Q29: @IF($A29=1,$H29*($G$11<=$E29)*($G$12>=$F29),$H29*($G$11<=$F29)*($G$12>=$E29))
R29: @IF($A29=1,$H29*($G$12<=$E29)*($G$13>=$F29),$H29*($G$12<=$F29)*($G$13>=$E29))
S29: @IF($A29=1,$H29*($G$13<=$E29)*($G$14>=$F29),$H29*($G$13<=$F29)*($G$14>=$E29))
T29: @IF($A29=1,$H29*($G$14<=$E29)*($G$15>=$F29),$H29*($G$14<=$F29)*($G$15>=$E29))
U29: @IF($A29=1,$H29*($G$15<=$E29)*($G$16>=$F29),$H29*($G$15<=$F29)*($G$16>=$E29))
V29: @IF($A29=1,$H29*($G$16<=$E29)*($G$17>=$F29),$H29*($G$16<=$F29)*($G$17>=$E29))
W29: @IF($A29=1,$H29*($G$17<=$E29)*($G$18>=$F29),$H29*($G$17<=$F29)*($G$18>=$E29))
X29: @IF($A29=1,$H29*($G$18<=$E29)*($G$19>=$F29),$H29*($G$18<=$F29)*($G$19>=$E29))
Y29: @IF($A29=1,$H29*($G$19<=$E29)*($G$20>=$F29),$H29*($G$19<=$F29)*($G$20>=$E29))
Z29: @IF($A29=1,$H29*($G$20<=$E29)*($G$21>=$F29),$H29*($G$20<=$F29)*($G$21>=$E29))
AA29: @IF($A29=1,$H29*($G$21<=$E29)*($G$22>=$F29),$H29*($G$21<=$F29)*($G$22>=$E29))
AB29: @IF($A29=1,$H29*($G$22<=$E29)*($G$23>=$F29),$H29*($G$22<=$F29)*($G$23>=$E29))
AC29: @IF($A29=1,$H29*($G$23<=$E29)*($G$24>=$F29),$H29*($G$23<=$F29)*($G$24>=$E29))
AD29: @IF($A29=1,$H29*($G$24<=$E29)*($G$25>=$F29),$H29*($G$24<=$F29)*($G$25>=$E29))
AE29: @IF($A29=1,$H29*($G$25<=$E29)*($G$26>=$F29),$H29*($G$25<=$F29)*($G$26>=$E29))
AF29: @IF($A29=1,$H29*($G$26<=$E29)*($G$27>=$F29),$H29*($G$26<=$F29)*($G$27>=$E29))
AG29: @IF($A29=1,$H29*($G$27<=$E29)*($G$28>=$F29),$H29*($G$27<=$F29)*($G$28>=$E29))
AH29: @IF($A29=1,$H29*($G$28<=$E29)*($G$29>=$F29),$H29*($G$28<=$F29)*($G$29>=$E29))
AI29: @IF($A29=1,$H29*($G$29<=$E29)*($G$30>=$F29),$H29*($G$29<=$F29)*($G$30>=$E29))
AJ29: @IF($A29=1,$H29*($G$30<=$E29)*($G$31>=$F29),$H29*($G$30<=$F29)*($G$31>=$E29))
AK29: @IF($A29=1,$H29*($G$31<=$E29)*($G$32>=$F29),$H29*($G$31<=$F29)*($G$32>=$E29))
AL29: @IF($A29=1,$H29*($G$32<=$E29)*($G$33>=$F29),$H29*($G$32<=$F29)*($G$33>=$E29))
AM29: @IF($A29=1,$H29*($G$33<=$E29)*($G$34>=$F29),$H29*($G$33<=$F29)*($G$34>=$E29))
AN29: @IF($A29=1,$H29*($G$34<=$E29)*($G$35>=$F29),$H29*($G$34<=$F29)*($G$35>=$E29))
AO29: @IF($A29=1,$H29*($G$35<=$E29)*($G$36>=$F29),$H29*($G$35<=$F29)*($G$36>=$E29))
AP29: @IF($A29=1,$H29*($G$36<=$E29)*($G$37>=$F29),$H29*($G$36<=$F29)*($G$37>=$E29))
AQ29: @IF($A29=1,$H29*($G$37<=$E29)*($G$38>=$F29),$H29*($G$37<=$F29)*($G$38>=$E29))
AR29: @IF($A29=1,$H29*($G$38<=$E29)*($G$39>=$F29),$H29*($G$38<=$F29)*($G$39>=$E29))
AS29: @IF($A29=1,$H29*($G$39<=$E29)*($G$40>=$F29),$H29*($G$39<=$F29)*($G$40>=$E29))
AT29: @IF($A29=1,$H29*($G$40<=$E29)*($G$41>=$F29),$H29*($G$40<=$F29)*($G$41>=$E29))
AU29: @IF($A29=1,$H29*($G$41<=$E29)*($G$42>=$F29),$H29*($G$41<=$F29)*($G$42>=$E29))
AV29: @IF($A29=1,$H29*($G$42<=$E29)*($G$43>=$F29),$H29*($G$42<=$F29)*($G$43>=$E29))
AW29: @IF($A29=1,$H29*($G$43<=$E29)*($G$44>=$F29),$H29*($G$43<=$F29)*($G$44>=$E29))
AX29: @IF($A29=1,$H29*($G$44<=$E29)*($G$45>=$F29),$H29*($G$44<=$F29)*($G$45>=$E29))
AY29: @IF($A29=1,$H29*($G$45<=$E29)*($G$46>=$F29),$H29*($G$45<=$F29)*($G$46>=$E29))
AZ29: @IF($A29=1,$H29*($G$46<=$E29)*($G$47>=$F29),$H29*($G$46<=$F29)*($G$47>=$E29))
BA29: @IF($A29=1,$H29*($G$47<=$E29)*($G$48>=$F29),$H29*($G$47<=$F29)*($G$48>=$E29))
BB29: @IF($A29=1,$H29*($G$48<=$E29)*($G$49>=$F29),$H29*($G$48<=$F29)*($G$49>=$E29))
BC29: @IF($A29=1,$H29*($G$49<=$E29)*($G$50>=$F29),$H29*($G$49<=$F29)*($G$50>=$E29))
BD29: @IF($A29=1,$H29*($G$50<=$E29)*($G$51>=$F29),$H29*($G$50<=$F29)*($G$51>=$E29))
BE29: @IF($A29=1,$H29*($G$51<=$E29)*($G$52>=$F29),$H29*($G$51<=$F29)*($G$52>=$E29))
BF29: @IF($A29=1,$H29*($G$52<=$E29)*($G$53>=$F29),$H29*($G$52<=$F29)*($G$53>=$E29))
BG29: @IF($A29=1,$H29*($G$53<=$E29)*($G$54>=$F29),$H29*($G$53<=$F29)*($G$54>=$E29))
BH29: @IF($A29=1,$H29*($G$54<=$E29)*($G$55>=$F29),$H29*($G$54<=$F29)*($G$55>=$E29))
BI29: @IF($A29=1,$H29*($G$55<=$E29)*($G$56>=$F29),$H29*($G$55<=$F29)*($G$56>=$E29))
BJ29: @IF($A29=1,$H29*($G$56<=$E29)*($G$57>=$F29),$H29*($G$56<=$F29)*($G$57>=$E29))
BK29: @IF($A29=1,$H29*($G$57<=$E29)*($G$58>=$F29),$H29*($G$57<=$F29)*($G$58>=$E29))
BL29: @IF($A29=1,$H29*($G$58<=$E29)*($G$59>=$F29),$H29*($G$58<=$F29)*($G$59>=$E29))
BM29: @IF($A29=1,$H29*($G$59<=$E29)*($G$60>=$F29),$H29*($G$59<=$F29)*($G$60>=$E29))
BN29: @IF($A29=1,$H29*($G$60<=$E29)*($G$61>=$F29),$H29*($G$60<=$F29)*($G$61>=$E29))
BO29: @IF($A29=1,$H29*($G$61<=$E29)*($G$62>=$F29),$H29*($G$61<=$F29)*($G$62>=$E29))
BP29: @IF($A29=1,$H29*($G$62<=$E29)*($G$63>=$F29),$H29*($G$62<=$F29)*($G$63>=$E29))
```

```
BQ29: @IF($A29=1,$H29*($G$63<=$E29)*($G$64>=$F29),$H29*($G$63<=$F29)*($G$64>=$E29))
BR29: @IF($A29=1,$H29*($G$64<=$E29)*($G$65>=$F29),$H29*($G$64<=$F29)*($G$65>=$E29))
BS29: @IF($A29=1,$H29*($G$65<=$E29)*($G$66>=$F29),$H29*($G$65<=$F29)*($G$66>=$E29))
BT29: @IF($A29=1,$H29*($G$66<=$E29)*($G$67>=$F29),$H29*($G$66<=$F29)*($G$67>=$E29))
BU29: @IF($A29=1,$H29*($G$67<=$E29)*($G$68>=$F29),$H29*($G$67<=$F29)*($G$68>=$E29))
BV29: @IF($A29=1,$H29*($G$68<=$E29)*($G$69>=$F29),$H29*($G$68<=$F29)*($G$69>=$E29))
BW29: @IF($A29=1,$H29*($G$69<=$E29)*($G$70>=$F29),$H29*($G$69<=$F29)*($G$70>=$E29))
BX29: @IF($A29=1,$H29*($G$70<=$E29)*($G$71>=$F29),$H29*($G$70<=$F29)*($G$71>=$E29))
BY29: @IF($A29=1,$H29*($G$71<=$E29)*($G$72>=$F29),$H29*($G$71<=$F29)*($G$72>=$E29))
BZ29: @IF($A29=1,$H29*($G$72<=$E29)*($G$73>=$F29),$H29*($G$72<=$F29)*($G$73>=$E29))
P30: @IF($A30=1,$H30*($G$10<=$E30)*($G$11>=$F30),$H30*($G$10<=$F30)*($G$11>=$E30))
Q30: @IF($A30=1,$H30*($G$11<=$E30)*($G$12>=$F30),$H30*($G$11<=$F30)*($G$12>=$E30))
R30: @IF($A30=1,$H30*($G$12<=$E30)*($G$13>=$F30),$H30*($G$12<=$F30)*($G$13>=$E30))
S30: @IF($A30=1,$H30*($G$13<=$E30)*($G$14>=$F30),$H30*($G$13<=$F30)*($G$14>=$E30))
T30: @IF($A30=1,$H30*($G$14<=$E30)*($G$15>=$F30),$H30*($G$14<=$F30)*($G$15>=$E30))
U30: @IF($A30=1,$H30*($G$15<=$E30)*($G$16>=$F30),$H30*($G$15<=$F30)*($G$16>=$E30))
V30: @IF($A30=1,$H30*($G$16<=$E30)*($G$17>=$F30),$H30*($G$16<=$F30)*($G$17>=$E30))
W30: @IF($A30=1,$H30*($G$17<=$E30)*($G$18>=$F30),$H30*($G$17<=$F30)*($G$18>=$E30))
X30: @IF($A30=1,$H30*($G$18<=$E30)*($G$19>=$F30),$H30*($G$18<=$F30)*($G$19>=$E30))
Y30: @IF($A30=1,$H30*($G$19<=$E30)*($G$20>=$F30),$H30*($G$19<=$F30)*($G$20>=$E30))
Z30: @IF($A30=1,$H30*($G$20<=$E30)*($G$21>=$F30),$H30*($G$20<=$F30)*($G$21>=$E30))
AA30: @IF($A30=1,$H30*($G$21<=$E30)*($G$22>=$F30),$H30*($G$21<=$F30)*($G$22>=$E30))
AB30: @IF($A30=1,$H30*($G$22<=$E30)*($G$23>=$F30),$H30*($G$22<=$F30)*($G$23>=$E30))
AC30: @IF($A30=1,$H30*($G$23<=$E30)*($G$24>=$F30),$H30*($G$23<=$F30)*($G$24>=$E30))
AD30: @IF($A30=1,$H30*($G$24<=$E30)*($G$25>=$F30),$H30*($G$24<=$F30)*($G$25>=$E30))
AE30: @IF($A30=1,$H30*($G$25<=$E30)*($G$26>=$F30),$H30*($G$25<=$F30)*($G$26>=$E30))
AF30: @IF($A30=1,$H30*($G$26<=$E30)*($G$27>=$F30),$H30*($G$26<=$F30)*($G$27>=$E30))
AG30: @IF($A30=1,$H30*($G$27<=$E30)*($G$28>=$F30),$H30*($G$27<=$F30)*($G$28>=$E30))
AH30: @IF($A30=1,$H30*($G$28<=$E30)*($G$29>=$F30),$H30*($G$28<=$F30)*($G$29>=$E30))
AI30: @IF($A30=1,$H30*($G$29<=$E30)*($G$30>=$F30),$H30*($G$29<=$F30)*($G$30>=$E30))
AJ30: @IF($A30=1,$H30*($G$30<=$E30)*($G$31>=$F30),$H30*($G$30<=$F30)*($G$31>=$E30))
AK30: @IF($A30=1,$H30*($G$31<=$E30)*($G$32>=$F30),$H30*($G$31<=$F30)*($G$32>=$E30))
AL30: @IF($A30=1,$H30*($G$32<=$E30)*($G$33>=$F30),$H30*($G$32<=$F30)*($G$33>=$E30))
AM30: @IF($A30=1,$H30*($G$33<=$E30)*($G$34>=$F30),$H30*($G$33<=$F30)*($G$34>=$E30))
AN30: @IF($A30=1,$H30*($G$34<=$E30)*($G$35>=$F30),$H30*($G$34<=$F30)*($G$35>=$E30))
AO30: @IF($A30=1,$H30*($G$35<=$E30)*($G$36>=$F30),$H30*($G$35<=$F30)*($G$36>=$E30))
AP30: @IF($A30=1,$H30*($G$36<=$E30)*($G$37>=$F30),$H30*($G$36<=$F30)*($G$37>=$E30))
AQ30: @IF($A30=1,$H30*($G$37<=$E30)*($G$38>=$F30),$H30*($G$37<=$F30)*($G$38>=$E30))
AR30: @IF($A30=1,$H30*($G$38<=$E30)*($G$39>=$F30),$H30*($G$38<=$F30)*($G$39>=$E30))
AS30: @IF($A30=1,$H30*($G$39<=$E30)*($G$40>=$F30),$H30*($G$39<=$F30)*($G$40>=$E30))
AT30: @IF($A30=1,$H30*($G$40<=$E30)*($G$41>=$F30),$H30*($G$40<=$F30)*($G$41>=$E30))
AU30: @IF($A30=1,$H30*($G$41<=$E30)*($G$42>=$F30),$H30*($G$41<=$F30)*($G$42>=$E30))
AV30: @IF($A30=1,$H30*($G$42<=$E30)*($G$43>=$F30),$H30*($G$42<=$F30)*($G$43>=$E30))
AW30: @IF($A30=1,$H30*($G$43<=$E30)*($G$44>=$F30),$H30*($G$43<=$F30)*($G$44>=$E30))
AX30: @IF($A30=1,$H30*($G$44<=$E30)*($G$45>=$F30),$H30*($G$44<=$F30)*($G$45>=$E30))
AY30: @IF($A30=1,$H30*($G$45<=$E30)*($G$46>=$F30),$H30*($G$45<=$F30)*($G$46>=$E30))
AZ30: @IF($A30=1,$H30*($G$46<=$E30)*($G$47>=$F30),$H30*($G$46<=$F30)*($G$47>=$E30))
BA30: @IF($A30=1,$H30*($G$47<=$E30)*($G$48>=$F30),$H30*($G$47<=$F30)*($G$48>=$E30))
BB30: @IF($A30=1,$H30*($G$48<=$E30)*($G$49>=$F30),$H30*($G$48<=$F30)*($G$49>=$E30))
BC30: @IF($A30=1,$H30*($G$49<=$E30)*($G$50>=$F30),$H30*($G$49<=$F30)*($G$50>=$E30))
BD30: @IF($A30=1,$H30*($G$50<=$E30)*($G$51>=$F30),$H30*($G$50<=$F30)*($G$51>=$E30))
BE30: @IF($A30=1,$H30*($G$51<=$E30)*($G$52>=$F30),$H30*($G$51<=$F30)*($G$52>=$E30))
BF30: @IF($A30=1,$H30*($G$52<=$E30)*($G$53>=$F30),$H30*($G$52<=$F30)*($G$53>=$E30))
BG30: @IF($A30=1,$H30*($G$53<=$E30)*($G$54>=$F30),$H30*($G$53<=$F30)*($G$54>=$E30))
BH30: @IF($A30=1,$H30*($G$54<=$E30)*($G$55>=$F30),$H30*($G$54<=$F30)*($G$55>=$E30))
BI30: @IF($A30=1,$H30*($G$55<=$E30)*($G$56>=$F30),$H30*($G$55<=$F30)*($G$56>=$E30))
```

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BJ30: @IF($A30=1,$H30*($G$56<=$E30)*($G$57>=$F30),$H30*($G$56<=$F30)*($G$57>=$E30))
BK30: @IF($A30=1,$H30*($G$57<=$E30)*($G$58>=$F30),$H30*($G$57<=$F30)*($G$58>=$E30))
BL30: @IF($A30=1,$H30*($G$58<=$E30)*($G$59>=$F30),$H30*($G$58<=$F30)*($G$59>=$E30))
BM30: @IF($A30=1,$H30*($G$59<=$E30)*($G$60>=$F30),$H30*($G$59<=$F30)*($G$60>=$E30))
BN30: @IF($A30=1,$H30*($G$60<=$E30)*($G$61>=$F30),$H30*($G$60<=$F30)*($G$61>=$E30))
BO30: @IF($A30=1,$H30*($G$61<=$E30)*($G$62>=$F30),$H30*($G$61<=$F30)*($G$62>=$E30))
BP30: @IF($A30=1,$H30*($G$62<=$E30)*($G$63>=$F30),$H30*($G$62<=$F30)*($G$63>=$E30))
BQ30: @IF($A30=1,$H30*($G$63<=$E30)*($G$64>=$F30),$H30*($G$63<=$F30)*($G$64>=$E30))
BR30: @IF($A30=1,$H30*($G$64<=$E30)*($G$65>=$F30),$H30*($G$64<=$F30)*($G$65>=$E30))
BS30: @IF($A30=1,$H30*($G$65<=$E30)*($G$66>=$F30),$H30*($G$65<=$F30)*($G$66>=$E30))
BT30: @IF($A30=1,$H30*($G$66<=$E30)*($G$67>=$F30),$H30*($G$66<=$F30)*($G$67>=$E30))
BU30: @IF($A30=1,$H30*($G$67<=$E30)*($G$68>=$F30),$H30*($G$67<=$F30)*($G$68>=$E30))
BV30: @IF($A30=1,$H30*($G$68<=$E30)*($G$69>=$F30),$H30*($G$68<=$F30)*($G$69>=$E30))
BW30: @IF($A30=1,$H30*($G$69<=$E30)*($G$70>=$F30),$H30*($G$69<=$F30)*($G$70>=$E30))
BX30: @IF($A30=1,$H30*($G$70<=$E30)*($G$71>=$F30),$H30*($G$70<=$F30)*($G$71>=$E30))
BY30: @IF($A30=1,$H30*($G$71<=$E30)*($G$72>=$F30),$H30*($G$71<=$F30)*($G$72>=$E30))
BZ30: @IF($A30=1,$H30*($G$72<=$E30)*($G$73>=$F30),$H30*($G$72<=$F30)*($G$73>=$E30))
P31: @IF($A31=1,$H31*($G$10<=$E31)*($G$11>=$F31),$H31*($G$10<=$F31)*($G$11>=$E31))
Q31: @IF($A31=1,$H31*($G$11<=$E31)*($G$12>=$F31),$H31*($G$11<=$F31)*($G$12>=$E31))
R31: @IF($A31=1,$H31*($G$12<=$E31)*($G$13>=$F31),$H31*($G$12<=$F31)*($G$13>=$E31))
S31: @IF($A31=1,$H31*($G$13<=$E31)*($G$14>=$F31),$H31*($G$13<=$F31)*($G$14>=$E31))
T31: @IF($A31=1,$H31*($G$14<=$E31)*($G$15>=$F31),$H31*($G$14<=$F31)*($G$15>=$E31))
U31: @IF($A31=1,$H31*($G$15<=$E31)*($G$16>=$F31),$H31*($G$15<=$F31)*($G$16>=$E31))
V31: @IF($A31=1,$H31*($G$16<=$E31)*($G$17>=$F31),$H31*($G$16<=$F31)*($G$17>=$E31))
W31: @IF($A31=1,$H31*($G$17<=$E31)*($G$18>=$F31),$H31*($G$17<=$F31)*($G$18>=$E31))
X31: @IF($A31=1,$H31*($G$18<=$E31)*($G$19>=$F31),$H31*($G$18<=$F31)*($G$19>=$E31))
Y31: @IF($A31=1,$H31*($G$19<=$E31)*($G$20>=$F31),$H31*($G$19<=$F31)*($G$20>=$E31))
Z31: @IF($A31=1,$H31*($G$20<=$E31)*($G$21>=$F31),$H31*($G$20<=$F31)*($G$21>=$E31))
AA31: @IF($A31=1,$H31*($G$21<=$E31)*($G$22>=$F31),$H31*($G$21<=$F31)*($G$22>=$E31))
AB31: @IF($A31=1,$H31*($G$22<=$E31)*($G$23>=$F31),$H31*($G$22<=$F31)*($G$23>=$E31))
AC31: @IF($A31=1,$H31*($G$23<=$E31)*($G$24>=$F31),$H31*($G$23<=$F31)*($G$24>=$E31))
AD31: @IF($A31=1,$H31*($G$24<=$E31)*($G$25>=$F31),$H31*($G$24<=$F31)*($G$25>=$E31))
AE31: @IF($A31=1,$H31*($G$25<=$E31)*($G$26>=$F31),$H31*($G$25<=$F31)*($G$26>=$E31))
AF31: @IF($A31=1,$H31*($G$26<=$E31)*($G$27>=$F31),$H31*($G$26<=$F31)*($G$27>=$E31))
AG31: @IF($A31=1,$H31*($G$27<=$E31)*($G$28>=$F31),$H31*($G$27<=$F31)*($G$28>=$E31))
AH31: @IF($A31=1,$H31*($G$28<=$E31)*($G$29>=$F31),$H31*($G$28<=$F31)*($G$29>=$E31))
AI31: @IF($A31=1,$H31*($G$29<=$E31)*($G$30>=$F31),$H31*($G$29<=$F31)*($G$30>=$E31))
AJ31: @IF($A31=1,$H31*($G$30<=$E31)*($G$31>=$F31),$H31*($G$30<=$F31)*($G$31>=$E31))
AK31: @IF($A31=1,$H31*($G$31<=$E31)*($G$32>=$F31),$H31*($G$31<=$F31)*($G$32>=$E31))
AL31: @IF($A31=1,$H31*($G$32<=$E31)*($G$33>=$F31),$H31*($G$32<=$F31)*($G$33>=$E31))
AM31: @IF($A31=1,$H31*($G$33<=$E31)*($G$34>=$F31),$H31*($G$33<=$F31)*($G$34>=$E31))
AN31: @IF($A31=1,$H31*($G$34<=$E31)*($G$35>=$F31),$H31*($G$34<=$F31)*($G$35>=$E31))
AO31: @IF($A31=1,$H31*($G$35<=$E31)*($G$36>=$F31),$H31*($G$35<=$F31)*($G$36>=$E31))
AP31: @IF($A31=1,$H31*($G$36<=$E31)*($G$37>=$F31),$H31*($G$36<=$F31)*($G$37>=$E31))
AQ31: @IF($A31=1,$H31*($G$37<=$E31)*($G$38>=$F31),$H31*($G$37<=$F31)*($G$38>=$E31))
AR31: @IF($A31=1,$H31*($G$38<=$E31)*($G$39>=$F31),$H31*($G$38<=$F31)*($G$39>=$E31))
AS31: @IF($A31=1,$H31*($G$39<=$E31)*($G$40>=$F31),$H31*($G$39<=$F31)*($G$40>=$E31))
AT31: @IF($A31=1,$H31*($G$40<=$E31)*($G$41>=$F31),$H31*($G$40<=$F31)*($G$41>=$E31))
AU31: @IF($A31=1,$H31*($G$41<=$E31)*($G$42>=$F31),$H31*($G$41<=$F31)*($G$42>=$E31))
AV31: @IF($A31=1,$H31*($G$42<=$E31)*($G$43>=$F31),$H31*($G$42<=$F31)*($G$43>=$E31))
AW31: @IF($A31=1,$H31*($G$43<=$E31)*($G$44>=$F31),$H31*($G$43<=$F31)*($G$44>=$E31))
AX31: @IF($A31=1,$H31*($G$44<=$E31)*($G$45>=$F31),$H31*($G$44<=$F31)*($G$45>=$E31))
AY31: @IF($A31=1,$H31*($G$45<=$E31)*($G$46>=$F31),$H31*($G$45<=$F31)*($G$46>=$E31))
AZ31: @IF($A31=1,$H31*($G$46<=$E31)*($G$47>=$F31),$H31*($G$46<=$F31)*($G$47>=$E31))
BA31: @IF($A31=1,$H31*($G$47<=$E31)*($G$48>=$F31),$H31*($G$47<=$F31)*($G$48>=$E31))
BB31: @IF($A31=1,$H31*($G$48<=$E31)*($G$49>=$F31),$H31*($G$48<=$F31)*($G$49>=$E31))
```

```
BC31: @IF($A31=1,$H31*($G$49<=$E31)*($G$50>=$F31),$H31*($G$49<=$F31)*($G$50>=$E31))
BD31: @IF($A31=1,$H31*($G$50<=$E31)*($G$51>=$F31),$H31*($G$50<=$F31)*($G$51>=$E31))
BE31: @IF($A31=1,$H31*($G$51<=$E31)*($G$52>=$F31),$H31*($G$51<=$F31)*($G$52>=$E31))
BF31: @IF($A31=1,$H31*($G$52<=$E31)*($G$53>=$F31),$H31*($G$52<=$F31)*($G$53>=$E31))
BG31: @IF($A31=1,$H31*($G$53<=$E31)*($G$54>=$F31),$H31*($G$53<=$F31)*($G$54>=$E31))
BH31: @IF($A31=1,$H31*($G$54<=$E31)*($G$55>=$F31),$H31*($G$54<=$F31)*($G$55>=$E31))
BI31: @IF($A31=1,$H31*($G$55<=$E31)*($G$56>=$F31),$H31*($G$55<=$F31)*($G$56>=$E31))
BJ31: @IF($A31=1,$H31*($G$56<=$E31)*($G$57>=$F31),$H31*($G$56<=$F31)*($G$57>=$E31))
BK31: @IF($A31=1,$H31*($G$57<=$E31)*($G$58>=$F31),$H31*($G$57<=$F31)*($G$58>=$E31))
BL31: @IF($A31=1,$H31*($G$58<=$E31)*($G$59>=$F31),$H31*($G$58<=$F31)*($G$59>=$E31))
BM31: @IF($A31=1,$H31*($G$59<=$E31)*($G$60>=$F31),$H31*($G$59<=$F31)*($G$60>=$E31))
BN31: @IF($A31=1,$H31*($G$60<=$E31)*($G$61>=$F31),$H31*($G$60<=$F31)*($G$61>=$E31))
BO31: @IF($A31=1,$H31*($G$61<=$E31)*($G$62>=$F31),$H31*($G$61<=$F31)*($G$62>=$E31))
BP31: @IF($A31=1,$H31*($G$62<=$E31)*($G$63>=$F31),$H31*($G$62<=$F31)*($G$63>=$E31))
BQ31: @IF($A31=1,$H31*($G$63<=$E31)*($G$64>=$F31),$H31*($G$63<=$F31)*($G$64>=$E31))
BR31: @IF($A31=1,$H31*($G$64<=$E31)*($G$65>=$F31),$H31*($G$64<=$F31)*($G$65>=$E31))
BS31: @IF($A31=1,$H31*($G$65<=$E31)*($G$66>=$F31),$H31*($G$65<=$F31)*($G$66>=$E31))
BT31: @IF($A31=1,$H31*($G$66<=$E31)*($G$67>=$F31),$H31*($G$66<=$F31)*($G$67>=$E31))
BU31: @IF($A31=1,$H31*($G$67<=$E31)*($G$68>=$F31),$H31*($G$67<=$F31)*($G$68>=$E31))
BV31: @IF($A31=1,$H31*($G$68<=$E31)*($G$69>=$F31),$H31*($G$68<=$F31)*($G$69>=$E31))
BW31: @IF($A31=1,$H31*($G$69<=$E31)*($G$70>=$F31),$H31*($G$69<=$F31)*($G$70>=$E31))
BX31: @IF($A31=1,$H31*($G$70<=$E31)*($G$71>=$F31),$H31*($G$70<=$F31)*($G$71>=$E31))
BY31: @IF($A31=1,$H31*($G$71<=$E31)*($G$72>=$F31),$H31*($G$71<=$F31)*($G$72>=$E31))
BZ31: @IF($A31=1,$H31*($G$72<=$E31)*($G$73>=$F31),$H31*($G$72<=$F31)*($G$73>=$E31))
P32: @IF($A32=1,$H32*($G$10<=$E32)*($G$11>=$F32),$H32*($G$10<=$F32)*($G$11>=$E32))
Q32: @IF($A32=1,$H32*($G$11<=$E32)*($G$12>=$F32),$H32*($G$11<=$F32)*($G$12>=$E32))
R32: @IF($A32=1,$H32*($G$12<=$E32)*($G$13>=$F32),$H32*($G$12<=$F32)*($G$13>=$E32))
S32: @IF($A32=1,$H32*($G$13<=$E32)*($G$14>=$F32),$H32*($G$13<=$F32)*($G$14>=$E32))
T32: @IF($A32=1,$H32*($G$14<=$E32)*($G$15>=$F32),$H32*($G$14<=$F32)*($G$15>=$E32))
U32: @IF($A32=1,$H32*($G$15<=$E32)*($G$16>=$F32),$H32*($G$15<=$F32)*($G$16>=$E32))
V32: @IF($A32=1,$H32*($G$16<=$E32)*($G$17>=$F32),$H32*($G$16<=$F32)*($G$17>=$E32))
W32: @IF($A32=1,$H32*($G$17<=$E32)*($G$18>=$F32),$H32*($G$17<=$F32)*($G$18>=$E32))
X32: @IF($A32=1,$H32*($G$18<=$E32)*($G$19>=$F32),$H32*($G$18<=$F32)*($G$19>=$E32))
Y32: @IF($A32=1,$H32*($G$19<=$E32)*($G$20>=$F32),$H32*($G$19<=$F32)*($G$20>=$E32))
Z32: @IF($A32=1,$H32*($G$20<=$E32)*($G$21>=$F32),$H32*($G$20<=$F32)*($G$21>=$E32))
AA32: @IF($A32=1,$H32*($G$21<=$E32)*($G$22>=$F32),$H32*($G$21<=$F32)*($G$22>=$E32))
AB32: @IF($A32=1,$H32*($G$22<=$E32)*($G$23>=$F32),$H32*($G$22<=$F32)*($G$23>=$E32))
AC32: @IF($A32=1,$H32*($G$23<=$E32)*($G$24>=$F32),$H32*($G$23<=$F32)*($G$24>=$E32))
AD32: @IF($A32=1,$H32*($G$24<=$E32)*($G$25>=$F32),$H32*($G$24<=$F32)*($G$25>=$E32))
AE32: @IF($A32=1,$H32*($G$25<=$E32)*($G$26>=$F32),$H32*($G$25<=$F32)*($G$26>=$E32))
AF32: @IF($A32=1,$H32*($G$26<=$E32)*($G$27>=$F32),$H32*($G$26<=$F32)*($G$27>=$E32))
AG32: @IF($A32=1,$H32*($G$27<=$E32)*($G$28>=$F32),$H32*($G$27<=$F32)*($G$28>=$E32))
AH32: @IF($A32=1,$H32*($G$28<=$E32)*($G$29>=$F32),$H32*($G$28<=$F32)*($G$29>=$E32))
AI32: @IF($A32=1,$H32*($G$29<=$E32)*($G$30>=$F32),$H32*($G$29<=$F32)*($G$30>=$E32))
AJ32: @IF($A32=1,$H32*($G$30<=$E32)*($G$31>=$F32),$H32*($G$30<=$F32)*($G$31>=$E32))
AK32: @IF($A32=1,$H32*($G$31<=$E32)*($G$32>=$F32),$H32*($G$31<=$F32)*($G$32>=$E32))
AL32: @IF($A32=1,$H32*($G$32<=$E32)*($G$33>=$F32),$H32*($G$32<=$F32)*($G$33>=$E32))
AM32: @IF($A32=1,$H32*($G$33<=$E32)*($G$34>=$F32),$H32*($G$33<=$F32)*($G$34>=$E32))
AN32: @IF($A32=1,$H32*($G$34<=$E32)*($G$35>=$F32),$H32*($G$34<=$F32)*($G$35>=$E32))
AO32: @IF($A32=1,$H32*($G$35<=$E32)*($G$36>=$F32),$H32*($G$35<=$F32)*($G$36>=$E32))
AP32: @IF($A32=1,$H32*($G$36<=$E32)*($G$37>=$F32),$H32*($G$36<=$F32)*($G$37>=$E32))
AQ32: @IF($A32=1,$H32*($G$37<=$E32)*($G$38>=$F32),$H32*($G$37<=$F32)*($G$38>=$E32))
AR32: @IF($A32=1,$H32*($G$38<=$E32)*($G$39>=$F32),$H32*($G$38<=$F32)*($G$39>=$E32))
AS32: @IF($A32=1,$H32*($G$39<=$E32)*($G$40>=$F32),$H32*($G$39<=$F32)*($G$40>=$E32))
AT32: @IF($A32=1,$H32*($G$40<=$E32)*($G$41>=$F32),$H32*($G$40<=$F32)*($G$41>=$E32))
AU32: @IF($A32=1,$H32*($G$41<=$E32)*($G$42>=$F32),$H32*($G$41<=$F32)*($G$42>=$E32))
```

```
AV32: @IF($A32=1,$H32*($G$42<=$E32)*($G$43>=$F32),$H32*($G$42<=$F32)*($G$43>=$E32))
AW32: @IF($A32=1,$H32*($G$43<=$E32)*($G$44>=$F32),$H32*($G$43<=$F32)*($G$44>=$E32))
AX32: @IF($A32=1,$H32*($G$44<=$E32)*($G$45>=$F32),$H32*($G$44<=$F32)*($G$45>=$E32))
AY32: @IF($A32=1,$H32*($G$45<=$E32)*($G$46>=$F32),$H32*($G$45<=$F32)*($G$46>=$E32))
AZ32: @IF($A32=1,$H32*($G$46<=$E32)*($G$47>=$F32),$H32*($G$46<=$F32)*($G$47>=$E32))
BA32: @IF($A32=1,$H32*($G$47<=$E32)*($G$48>=$F32),$H32*($G$47<=$F32)*($G$48>=$E32))
BB32: @IF($A32=1,$H32*($G$48<=$E32)*($G$49>=$F32),$H32*($G$48<=$F32)*($G$49>=$E32))
BC32: @IF($A32=1,$H32*($G$49<=$E32)*($G$50>=$F32),$H32*($G$49<=$F32)*($G$50>=$E32))
BD32: @IF($A32=1,$H32*($G$50<=$E32)*($G$51>=$F32),$H32*($G$50<=$F32)*($G$51>=$E32))
BE32: @IF($A32=1,$H32*($G$51<=$E32)*($G$52>=$F32),$H32*($G$51<=$F32)*($G$52>=$E32))
BF32: @IF($A32=1,$H32*($G$52<=$E32)*($G$53>=$F32),$H32*($G$52<=$F32)*($G$53>=$E32))
BG32: @IF($A32=1,$H32*($G$53<=$E32)*($G$54>=$F32),$H32*($G$53<=$F32)*($G$54>=$E32))
BH32: @IF($A32=1,$H32*($G$54<=$E32)*($G$55>=$F32),$H32*($G$54<=$F32)*($G$55>=$E32))
BI32: @IF($A32=1,$H32*($G$55<=$E32)*($G$56>=$F32),$H32*($G$55<=$F32)*($G$56>=$E32))
BJ32: @IF($A32=1,$H32*($G$56<=$E32)*($G$57>=$F32),$H32*($G$56<=$F32)*($G$57>=$E32))
BK32: @IF($A32=1,$H32*($G$57<=$E32)*($G$58>=$F32),$H32*($G$57<=$F32)*($G$58>=$E32))
BL32: @IF($A32=1,$H32*($G$58<=$E32)*($G$59>=$F32),$H32*($G$58<=$F32)*($G$59>=$E32))
BM32: @IF($A32=1,$H32*($G$59<=$E32)*($G$60>=$F32),$H32*($G$59<=$F32)*($G$60>=$E32))
BN32: @IF($A32=1,$H32*($G$60<=$E32)*($G$61>=$F32),$H32*($G$60<=$F32)*($G$61>=$E32))
BO32: @IF($A32=1,$H32*($G$61<=$E32)*($G$62>=$F32),$H32*($G$61<=$F32)*($G$62>=$E32))
BP32: @IF($A32=1,$H32*($G$62<=$E32)*($G$63>=$F32),$H32*($G$62<=$F32)*($G$63>=$E32))
BQ32: @IF($A32=1,$H32*($G$63<=$E32)*($G$64>=$F32),$H32*($G$63<=$F32)*($G$64>=$E32))
BR32: @IF($A32=1,$H32*($G$64<=$E32)*($G$65>=$F32),$H32*($G$64<=$F32)*($G$65>=$E32))
BS32: @IF($A32=1,$H32*($G$65<=$E32)*($G$66>=$F32),$H32*($G$65<=$F32)*($G$66>=$E32))
BT32: @IF($A32=1,$H32*($G$66<=$E32)*($G$67>=$F32),$H32*($G$66<=$F32)*($G$67>=$E32))
BU32: @IF($A32=1,$H32*($G$67<=$E32)*($G$68>=$F32),$H32*($G$67<=$F32)*($G$68>=$E32))
BV32: @IF($A32=1,$H32*($G$68<=$E32)*($G$69>=$F32),$H32*($G$68<=$F32)*($G$69>=$E32))
BW32: @IF($A32=1,$H32*($G$69<=$E32)*($G$70>=$F32),$H32*($G$69<=$F32)*($G$70>=$E32))
BX32: @IF($A32=1,$H32*($G$70<=$E32)*($G$71>=$F32),$H32*($G$70<=$F32)*($G$71>=$E32))
BY32: @IF($A32=1,$H32*($G$71<=$E32)*($G$72>=$F32),$H32*($G$71<=$F32)*($G$72>=$E32))
BZ32: @IF($A32=1,$H32*($G$72<=$E32)*($G$73>=$F32),$H32*($G$72<=$F32)*($G$73>=$E32))
P33: @IF($A33=1,$H33*($G$10<=$E33)*($G$11>=$F33),$H33*($G$10<=$F33)*($G$11>=$E33))
Q33: @IF($A33=1,$H33*($G$11<=$E33)*($G$12>=$F33),$H33*($G$11<=$F33)*($G$12>=$E33))
R33: @IF($A33=1,$H33*($G$12<=$E33)*($G$13>=$F33),$H33*($G$12<=$F33)*($G$13>=$E33))
S33: @IF($A33=1,$H33*($G$13<=$E33)*($G$14>=$F33),$H33*($G$13<=$F33)*($G$14>=$E33))
T33: @IF($A33=1,$H33*($G$14<=$E33)*($G$15>=$F33),$H33*($G$14<=$F33)*($G$15>=$E33))
U33: @IF($A33=1,$H33*($G$15<=$E33)*($G$16>=$F33),$H33*($G$15<=$F33)*($G$16>=$E33))
V33: @IF($A33=1,$H33*($G$16<=$E33)*($G$17>=$F33),$H33*($G$16<=$F33)*($G$17>=$E33))
W33: @IF($A33=1,$H33*($G$17<=$E33)*($G$18>=$F33),$H33*($G$17<=$F33)*($G$18>=$E33))
X33: @IF($A33=1,$H33*($G$18<=$E33)*($G$19>=$F33),$H33*($G$18<=$F33)*($G$19>=$E33))
Y33: @IF($A33=1,$H33*($G$19<=$E33)*($G$20>=$F33),$H33*($G$19<=$F33)*($G$20>=$E33))
Z33: @IF($A33=1,$H33*($G$20<=$E33)*($G$21>=$F33),$H33*($G$20<=$F33)*($G$21>=$E33))
AA33: @IF($A33=1,$H33*($G$21<=$E33)*($G$22>=$F33),$H33*($G$21<=$F33)*($G$22>=$E33))
AB33: @IF($A33=1,$H33*($G$22<=$E33)*($G$23>=$F33),$H33*($G$22<=$F33)*($G$23>=$E33))
AC33: @IF($A33=1,$H33*($G$23<=$E33)*($G$24>=$F33),$H33*($G$23<=$F33)*($G$24>=$E33))
AD33: @IF($A33=1,$H33*($G$24<=$E33)*($G$25>=$F33),$H33*($G$24<=$F33)*($G$25>=$E33))
AE33: @IF($A33=1,$H33*($G$25<=$E33)*($G$26>=$F33),$H33*($G$25<=$F33)*($G$26>=$E33))
AF33: @IF($A33=1,$H33*($G$26<=$E33)*($G$27>=$F33),$H33*($G$26<=$F33)*($G$27>=$E33))
AG33: @IF($A33=1,$H33*($G$27<=$E33)*($G$28>=$F33),$H33*($G$27<=$F33)*($G$28>=$E33))
AH33: @IF($A33=1,$H33*($G$28<=$E33)*($G$29>=$F33),$H33*($G$28<=$F33)*($G$29>=$E33))
AI33: @IF($A33=1,$H33*($G$29<=$E33)*($G$30>=$F33),$H33*($G$29<=$F33)*($G$30>=$E33))
AJ33: @IF($A33=1,$H33*($G$30<=$E33)*($G$31>=$F33),$H33*($G$30<=$F33)*($G$31>=$E33))
AK33: @IF($A33=1,$H33*($G$31<=$E33)*($G$32>=$F33),$H33*($G$31<=$F33)*($G$32>=$E33))
AL33: @IF($A33=1,$H33*($G$32<=$E33)*($G$33>=$F33),$H33*($G$32<=$F33)*($G$33>=$E33))
AM33: @IF($A33=1,$H33*($G$33<=$E33)*($G$34>=$F33),$H33*($G$33<=$F33)*($G$34>=$E33))
AN33: @IF($A33=1,$H33*($G$34<=$E33)*($G$35>=$F33),$H33*($G$34<=$F33)*($G$35>=$E33))
```

```
AO33: @IF($A33=1,$H33*($G$35<=$E33)*($G$36>=$F33),$H33*($G$35<=$F33)*($G$36>=$E33))
AP33: @IF($A33=1,$H33*($G$36<=$E33)*($G$37>=$F33),$H33*($G$36<=$F33)*($G$37>=$E33))
AQ33: @IF($A33=1,$H33*($G$37<=$E33)*($G$38>=$F33),$H33*($G$37<=$F33)*($G$38>=$E33))
AR33: @IF($A33=1,$H33*($G$38<=$E33)*($G$39>=$F33),$H33*($G$38<=$F33)*($G$39>=$E33))
AS33: @IF($A33=1,$H33*($G$39<=$E33)*($G$40>=$F33),$H33*($G$39<=$F33)*($G$40>=$E33))
AT33: @IF($A33=1,$H33*($G$40<=$E33)*($G$41>=$F33),$H33*($G$40<=$F33)*($G$41>=$E33))
AU33: @IF($A33=1,$H33*($G$41<=$E33)*($G$42>=$F33),$H33*($G$41<=$F33)*($G$42>=$E33))
AV33: @IF($A33=1,$H33*($G$42<=$E33)*($G$43>=$F33),$H33*($G$42<=$F33)*($G$43>=$E33))
AW33: @IF($A33=1,$H33*($G$43<=$E33)*($G$44>=$F33),$H33*($G$43<=$F33)*($G$44>=$E33))
AX33: @IF($A33=1,$H33*($G$44<=$E33)*($G$45>=$F33),$H33*($G$44<=$F33)*($G$45>=$E33))
AY33: @IF($A33=1,$H33*($G$45<=$E33)*($G$46>=$F33),$H33*($G$45<=$F33)*($G$46>=$E33))
AZ33: @IF($A33=1,$H33*($G$46<=$E33)*($G$47>=$F33),$H33*($G$46<=$F33)*($G$47>=$E33))
BA33: @IF($A33=1,$H33*($G$47<=$E33)*($G$48>=$F33),$H33*($G$47<=$F33)*($G$48>=$E33))
BB33: @IF($A33=1,$H33*($G$48<=$E33)*($G$49>=$F33),$H33*($G$48<=$F33)*($G$49>=$E33))
BC33: @IF($A33=1,$H33*($G$49<=$E33)*($G$50>=$F33),$H33*($G$49<=$F33)*($G$50>=$E33))
BD33: @IF($A33=1,$H33*($G$50<=$E33)*($G$51>=$F33),$H33*($G$50<=$F33)*($G$51>=$E33))
BE33: @IF($A33=1,$H33*($G$51<=$E33)*($G$52>=$F33),$H33*($G$51<=$F33)*($G$52>=$E33))
BF33: @IF($A33=1,$H33*($G$52<=$E33)*($G$53>=$F33),$H33*($G$52<=$F33)*($G$53>=$E33))
BG33: @IF($A33=1,$H33*($G$53<=$E33)*($G$54>=$F33),$H33*($G$53<=$F33)*($G$54>=$E33))
BH33: @IF($A33=1,$H33*($G$54<=$E33)*($G$55>=$F33),$H33*($G$54<=$F33)*($G$55>=$E33))
BI33: @IF($A33=1,$H33*($G$55<=$E33)*($G$56>=$F33),$H33*($G$55<=$F33)*($G$56>=$E33))
BJ33: @IF($A33=1,$H33*($G$56<=$E33)*($G$57>=$F33),$H33*($G$56<=$F33)*($G$57>=$E33))
BK33: @IF($A33=1,$H33*($G$57<=$E33)*($G$58>=$F33),$H33*($G$57<=$F33)*($G$58>=$E33))
BL33: @IF($A33=1,$H33*($G$58<=$E33)*($G$59>=$F33),$H33*($G$58<=$F33)*($G$59>=$E33))
BM33: @IF($A33=1,$H33*($G$59<=$E33)*($G$60>=$F33),$H33*($G$59<=$F33)*($G$60>=$E33))
BN33: @IF($A33=1,$H33*($G$60<=$E33)*($G$61>=$F33),$H33*($G$60<=$F33)*($G$61>=$E33))
BO33: @IF($A33=1,$H33*($G$61<=$E33)*($G$62>=$F33),$H33*($G$61<=$F33)*($G$62>=$E33))
BP33: @IF($A33=1,$H33*($G$62<=$E33)*($G$63>=$F33),$H33*($G$62<=$F33)*($G$63>=$E33))
BQ33: @IF($A33=1,$H33*($G$63<=$E33)*($G$64>=$F33),$H33*($G$63<=$F33)*($G$64>=$E33))
BR33: @IF($A33=1,$H33*($G$64<=$E33)*($G$65>=$F33),$H33*($G$64<=$F33)*($G$65>=$E33))
BS33: @IF($A33=1,$H33*($G$65<=$E33)*($G$66>=$F33),$H33*($G$65<=$F33)*($G$66>=$E33))
BT33: @IF($A33=1,$H33*($G$66<=$E33)*($G$67>=$F33),$H33*($G$66<=$F33)*($G$67>=$E33))
BU33: @IF($A33=1,$H33*($G$67<=$E33)*($G$68>=$F33),$H33*($G$67<=$F33)*($G$68>=$E33))
BV33: @IF($A33=1,$H33*($G$68<=$E33)*($G$69>=$F33),$H33*($G$68<=$F33)*($G$69>=$E33))
BW33: @IF($A33=1,$H33*($G$69<=$E33)*($G$70>=$F33),$H33*($G$69<=$F33)*($G$70>=$E33))
BX33: @IF($A33=1,$H33*($G$70<=$E33)*($G$71>=$F33),$H33*($G$70<=$F33)*($G$71>=$E33))
BY33: @IF($A33=1,$H33*($G$71<=$E33)*($G$72>=$F33),$H33*($G$71<=$F33)*($G$72>=$E33))
BZ33: @IF($A33=1,$H33*($G$72<=$E33)*($G$73>=$F33),$H33*($G$72<=$F33)*($G$73>=$E33))
P34: @IF($A34=1,$H34*($G$10<=$E34)*($G$11>=$F34),$H34*($G$10<=$F34)*($G$11>=$E34))
Q34: @IF($A34=1,$H34*($G$11<=$E34)*($G$12>=$F34),$H34*($G$11<=$F34)*($G$12>=$E34))
R34: @IF($A34=1,$H34*($G$12<=$E34)*($G$13>=$F34),$H34*($G$12<=$F34)*($G$13>=$E34))
S34: @IF($A34=1,$H34*($G$13<=$E34)*($G$14>=$F34),$H34*($G$13<=$F34)*($G$14>=$E34))
T34: @IF($A34=1,$H34*($G$14<=$E34)*($G$15>=$F34),$H34*($G$14<=$F34)*($G$15>=$E34))
U34: @IF($A34=1,$H34*($G$15<=$E34)*($G$16>=$F34),$H34*($G$15<=$F34)*($G$16>=$E34))
V34: @IF($A34=1,$H34*($G$16<=$E34)*($G$17>=$F34),$H34*($G$16<=$F34)*($G$17>=$E34))
W34: @IF($A34=1,$H34*($G$17<=$E34)*($G$18>=$F34),$H34*($G$17<=$F34)*($G$18>=$E34))
X34: @IF($A34=1,$H34*($G$18<=$E34)*($G$19>=$F34),$H34*($G$18<=$F34)*($G$19>=$E34))
Y34: @IF($A34=1,$H34*($G$19<=$E34)*($G$20>=$F34),$H34*($G$19<=$F34)*($G$20>=$E34))
Z34: @IF($A34=1,$H34*($G$20<=$E34)*($G$21>=$F34),$H34*($G$20<=$F34)*($G$21>=$E34))
AA34: @IF($A34=1,$H34*($G$21<=$E34)*($G$22>=$F34),$H34*($G$21<=$F34)*($G$22>=$E34))
AB34: @IF($A34=1,$H34*($G$22<=$E34)*($G$23>=$F34),$H34*($G$22<=$F34)*($G$23>=$E34))
AC34: @IF($A34=1,$H34*($G$23<=$E34)*($G$24>=$F34),$H34*($G$23<=$F34)*($G$24>=$E34))
AD34: @IF($A34=1,$H34*($G$24<=$E34)*($G$25>=$F34),$H34*($G$24<=$F34)*($G$25>=$E34))
AE34: @IF($A34=1,$H34*($G$25<=$E34)*($G$26>=$F34),$H34*($G$25<=$F34)*($G$26>=$E34))
AF34: @IF($A34=1,$H34*($G$26<=$E34)*($G$27>=$F34),$H34*($G$26<=$F34)*($G$27>=$E34))
AG34: @IF($A34=1,$H34*($G$27<=$E34)*($G$28>=$F34),$H34*($G$27<=$F34)*($G$28>=$E34))
```

```
AH34: @IF($A34=1,$H34*($G$28<=$E34)*($G$29>=$F34),$H34*($G$28<=$F34)*($G$29>=$E34))
AI34: @IF($A34=1,$H34*($G$29<=$E34)*($G$30>=$F34),$H34*($G$29<=$F34)*($G$30>=$E34))
AJ34: @IF($A34=1,$H34*($G$30<=$E34)*($G$31>=$F34),$H34*($G$30<=$F34)*($G$31>=$E34))
AK34: @IF($A34=1,$H34*($G$31<=$E34)*($G$32>=$F34),$H34*($G$31<=$F34)*($G$32>=$E34))
AL34: @IF($A34=1,$H34*($G$32<=$E34)*($G$33>=$F34),$H34*($G$32<=$F34)*($G$33>=$E34))
AM34: @IF($A34=1,$H34*($G$33<=$E34)*($G$34>=$F34),$H34*($G$33<=$F34)*($G$34>=$E34))
AN34: @IF($A34=1,$H34*($G$34<=$E34)*($G$35>=$F34),$H34*($G$34<=$F34)*($G$35>=$E34))
AO34: @IF($A34=1,$H34*($G$35<=$E34)*($G$36>=$F34),$H34*($G$35<=$F34)*($G$36>=$E34))
AP34: @IF($A34=1,$H34*($G$36<=$E34)*($G$37>=$F34),$H34*($G$36<=$F34)*($G$37>=$E34))
AQ34: @IF($A34=1,$H34*($G$37<=$E34)*($G$38>=$F34),$H34*($G$37<=$F34)*($G$38>=$E34))
AR34: @IF($A34=1,$H34*($G$38<=$E34)*($G$39>=$F34),$H34*($G$38<=$F34)*($G$39>=$E34))
AS34: @IF($A34=1,$H34*($G$39<=$E34)*($G$40>=$F34),$H34*($G$39<=$F34)*($G$40>=$E34))
AT34: @IF($A34=1,$H34*($G$40<=$E34)*($G$41>=$F34),$H34*($G$40<=$F34)*($G$41>=$E34))
AU34: @IF($A34=1,$H34*($G$41<=$E34)*($G$42>=$F34),$H34*($G$41<=$F34)*($G$42>=$E34))
AV34: @IF($A34=1,$H34*($G$42<=$E34)*($G$43>=$F34),$H34*($G$42<=$F34)*($G$43>=$E34))
AW34: @IF($A34=1,$H34*($G$43<=$E34)*($G$44>=$F34),$H34*($G$43<=$F34)*($G$44>=$E34))
AX34: @IF($A34=1,$H34*($G$44<=$E34)*($G$45>=$F34),$H34*($G$44<=$F34)*($G$45>=$E34))
AY34: @IF($A34=1,$H34*($G$45<=$E34)*($G$46>=$F34),$H34*($G$45<=$F34)*($G$46>=$E34))
AZ34: @IF($A34=1,$H34*($G$46<=$E34)*($G$47>=$F34),$H34*($G$46<=$F34)*($G$47>=$E34))
BA34: @IF($A34=1,$H34*($G$47<=$E34)*($G$48>=$F34),$H34*($G$47<=$F34)*($G$48>=$E34))
BB34: @IF($A34=1,$H34*($G$48<=$E34)*($G$49>=$F34),$H34*($G$48<=$F34)*($G$49>=$E34))
BC34: @IF($A34=1,$H34*($G$49<=$E34)*($G$50>=$F34),$H34*($G$49<=$F34)*($G$50>=$E34))
BD34: @IF($A34=1,$H34*($G$50<=$E34)*($G$51>=$F34),$H34*($G$50<=$F34)*($G$51>=$E34))
BE34: @IF($A34=1,$H34*($G$51<=$E34)*($G$52>=$F34),$H34*($G$51<=$F34)*($G$52>=$E34))
BF34: @IF($A34=1,$H34*($G$52<=$E34)*($G$53>=$F34),$H34*($G$52<=$F34)*($G$53>=$E34))
BG34: @IF($A34=1,$H34*($G$53<=$E34)*($G$54>=$F34),$H34*($G$53<=$F34)*($G$54>=$E34))
BH34: @IF($A34=1,$H34*($G$54<=$E34)*($G$55>=$F34),$H34*($G$54<=$F34)*($G$55>=$E34))
BI34: @IF($A34=1,$H34*($G$55<=$E34)*($G$56>=$F34),$H34*($G$55<=$F34)*($G$56>=$E34))
BJ34: @IF($A34=1,$H34*($G$56<=$E34)*($G$57>=$F34),$H34*($G$56<=$F34)*($G$57>=$E34))
BK34: @IF($A34=1,$H34*($G$57<=$E34)*($G$58>=$F34),$H34*($G$57<=$F34)*($G$58>=$E34))
BL34: @IF($A34=1,$H34*($G$58<=$E34)*($G$59>=$F34),$H34*($G$58<=$F34)*($G$59>=$E34))
BM34: @IF($A34=1,$H34*($G$59<=$E34)*($G$60>=$F34),$H34*($G$59<=$F34)*($G$60>=$E34))
BN34: @IF($A34=1,$H34*($G$60<=$E34)*($G$61>=$F34),$H34*($G$60<=$F34)*($G$61>=$E34))
BO34: @IF($A34=1,$H34*($G$61<=$E34)*($G$62>=$F34),$H34*($G$61<=$F34)*($G$62>=$E34))
BP34: @IF($A34=1,$H34*($G$62<=$E34)*($G$63>=$F34),$H34*($G$62<=$F34)*($G$63>=$E34))
BQ34: @IF($A34=1,$H34*($G$63<=$E34)*($G$64>=$F34),$H34*($G$63<=$F34)*($G$64>=$E34))
BR34: @IF($A34=1,$H34*($G$64<=$E34)*($G$65>=$F34),$H34*($G$64<=$F34)*($G$65>=$E34))
BS34: @IF($A34=1,$H34*($G$65<=$E34)*($G$66>=$F34),$H34*($G$65<=$F34)*($G$66>=$E34))
BT34: @IF($A34=1,$H34*($G$66<=$E34)*($G$67>=$F34),$H34*($G$66<=$F34)*($G$67>=$E34))
BU34: @IF($A34=1,$H34*($G$67<=$E34)*($G$68>=$F34),$H34*($G$67<=$F34)*($G$68>=$E34))
BV34: @IF($A34=1,$H34*($G$68<=$E34)*($G$69>=$F34),$H34*($G$68<=$F34)*($G$69>=$E34))
BW34: @IF($A34=1,$H34*($G$69<=$E34)*($G$70>=$F34),$H34*($G$69<=$F34)*($G$70>=$E34))
BX34: @IF($A34=1,$H34*($G$70<=$E34)*($G$71>=$F34),$H34*($G$70<=$F34)*($G$71>=$E34))
BY34: @IF($A34=1,$H34*($G$71<=$E34)*($G$72>=$F34),$H34*($G$71<=$F34)*($G$72>=$E34))
BZ34: @IF($A34=1,$H34*($G$72<=$E34)*($G$73>=$F34),$H34*($G$72<=$F34)*($G$73>=$E34))
P35: @IF($A35=1,$H35*($G$10<=$E35)*($G$11>=$F35),$H35*($G$10<=$F35)*($G$11>=$E35))
Q35: @IF($A35=1,$H35*($G$11<=$E35)*($G$12>=$F35),$H35*($G$11<=$F35)*($G$12>=$E35))
R35: @IF($A35=1,$H35*($G$12<=$E35)*($G$13>=$F35),$H35*($G$12<=$F35)*($G$13>=$E35))
S35: @IF($A35=1,$H35*($G$13<=$E35)*($G$14>=$F35),$H35*($G$13<=$F35)*($G$14>=$E35))
T35: @IF($A35=1,$H35*($G$14<=$E35)*($G$15>=$F35),$H35*($G$14<=$F35)*($G$15>=$E35))
U35: @IF($A35=1,$H35*($G$15<=$E35)*($G$16>=$F35),$H35*($G$15<=$F35)*($G$16>=$E35))
V35: @IF($A35=1,$H35*($G$16<=$E35)*($G$17>=$F35),$H35*($G$16<=$F35)*($G$17>=$E35))
W35: @IF($A35=1,$H35*($G$17<=$E35)*($G$18>=$F35),$H35*($G$17<=$F35)*($G$18>=$E35))
X35: @IF($A35=1,$H35*($G$18<=$E35)*($G$19>=$F35),$H35*($G$18<=$F35)*($G$19>=$E35))
Y35: @IF($A35=1,$H35*($G$19<=$E35)*($G$20>=$F35),$H35*($G$19<=$F35)*($G$20>=$E35))
Z35: @IF($A35=1,$H35*($G$20<=$E35)*($G$21>=$F35),$H35*($G$20<=$F35)*($G$21>=$E35))
```

```
AA35: @IF($A35=1,$H35*($G$21<=$E35)*($G$22>=$F35),$H35*($G$21<=$F35)*($G$22>=$E35))
AB35: @IF($A35=1,$H35*($G$22<=$E35)*($G$23>=$F35),$H35*($G$22<=$F35)*($G$23>=$E35))
AC35: @IF($A35=1,$H35*($G$23<=$E35)*($G$24>=$F35),$H35*($G$23<=$F35)*($G$24>=$E35))
AD35: @IF($A35=1,$H35*($G$24<=$E35)*($G$25>=$F35),$H35*($G$24<=$F35)*($G$25>=$E35))
AE35: @IF($A35=1,$H35*($G$25<=$E35)*($G$26>=$F35),$H35*($G$25<=$F35)*($G$26>=$E35))
AF35: @IF($A35=1,$H35*($G$26<=$E35)*($G$27>=$F35),$H35*($G$26<=$F35)*($G$27>=$E35))
AG35: @IF($A35=1,$H35*($G$27<=$E35)*($G$28>=$F35),$H35*($G$27<=$F35)*($G$28>=$E35))
AH35: @IF($A35=1,$H35*($G$28<=$E35)*($G$29>=$F35),$H35*($G$28<=$F35)*($G$29>=$E35))
AI35: @IF($A35=1,$H35*($G$29<=$E35)*($G$30>=$F35),$H35*($G$29<=$F35)*($G$30>=$E35))
AJ35: @IF($A35=1,$H35*($G$30<=$E35)*($G$31>=$F35),$H35*($G$30<=$F35)*($G$31>=$E35))
AK35: @IF($A35=1,$H35*($G$31<=$E35)*($G$32>=$F35),$H35*($G$31<=$F35)*($G$32>=$E35))
AL35: @IF($A35=1,$H35*($G$32<=$E35)*($G$33>=$F35),$H35*($G$32<=$F35)*($G$33>=$E35))
AM35: @IF($A35=1,$H35*($G$33<=$E35)*($G$34>=$F35),$H35*($G$33<=$F35)*($G$34>=$E35))
AN35: @IF($A35=1,$H35*($G$34<=$E35)*($G$35>=$F35),$H35*($G$34<=$F35)*($G$35>=$E35))
AO35: @IF($A35=1,$H35*($G$35<=$E35)*($G$36>=$F35),$H35*($G$35<=$F35)*($G$36>=$E35))
AP35: @IF($A35=1,$H35*($G$36<=$E35)*($G$37>=$F35),$H35*($G$36<=$F35)*($G$37>=$E35))
AQ35: @IF($A35=1,$H35*($G$37<=$E35)*($G$38>=$F35),$H35*($G$37<=$F35)*($G$38>=$E35))
AR35: @IF($A35=1,$H35*($G$38<=$E35)*($G$39>=$F35),$H35*($G$38<=$F35)*($G$39>=$E35))
AS35: @IF($A35=1,$H35*($G$39<=$E35)*($G$40>=$F35),$H35*($G$39<=$F35)*($G$40>=$E35))
AT35: @IF($A35=1,$H35*($G$40<=$E35)*($G$41>=$F35),$H35*($G$40<=$F35)*($G$41>=$E35))
AU35: @IF($A35=1,$H35*($G$41<=$E35)*($G$42>=$F35),$H35*($G$41<=$F35)*($G$42>=$E35))
AV35: @IF($A35=1,$H35*($G$42<=$E35)*($G$43>=$F35),$H35*($G$42<=$F35)*($G$43>=$E35))
AW35: @IF($A35=1,$H35*($G$43<=$E35)*($G$44>=$F35),$H35*($G$43<=$F35)*($G$44>=$E35))
AX35: @IF($A35=1,$H35*($G$44<=$E35)*($G$45>=$F35),$H35*($G$44<=$F35)*($G$45>=$E35))
AY35: @IF($A35=1,$H35*($G$45<=$E35)*($G$46>=$F35),$H35*($G$45<=$F35)*($G$46>=$E35))
AZ35: @IF($A35=1,$H35*($G$46<=$E35)*($G$47>=$F35),$H35*($G$46<=$F35)*($G$47>=$E35))
BA35: @IF($A35=1,$H35*($G$47<=$E35)*($G$48>=$F35),$H35*($G$47<=$F35)*($G$48>=$E35))
BB35: @IF($A35=1,$H35*($G$48<=$E35)*($G$49>=$F35),$H35*($G$48<=$F35)*($G$49>=$E35))
BC35: @IF($A35=1,$H35*($G$49<=$E35)*($G$50>=$F35),$H35*($G$49<=$F35)*($G$50>=$E35))
BD35: @IF($A35=1,$H35*($G$50<=$E35)*($G$51>=$F35),$H35*($G$50<=$F35)*($G$51>=$E35))
BE35: @IF($A35=1,$H35*($G$51<=$E35)*($G$52>=$F35),$H35*($G$51<=$F35)*($G$52>=$E35))
BF35: @IF($A35=1,$H35*($G$52<=$E35)*($G$53>=$F35),$H35*($G$52<=$F35)*($G$53>=$E35))
BG35: @IF($A35=1,$H35*($G$53<=$E35)*($G$54>=$F35),$H35*($G$53<=$F35)*($G$54>=$E35))
BH35: @IF($A35=1,$H35*($G$54<=$E35)*($G$55>=$F35),$H35*($G$54<=$F35)*($G$55>=$E35))
BI35: @IF($A35=1,$H35*($G$55<=$E35)*($G$56>=$F35),$H35*($G$55<=$F35)*($G$56>=$E35))
BJ35: @IF($A35=1,$H35*($G$56<=$E35)*($G$57>=$F35),$H35*($G$56<=$F35)*($G$57>=$E35))
BK35: @IF($A35=1,$H35*($G$57<=$E35)*($G$58>=$F35),$H35*($G$57<=$F35)*($G$58>=$E35))
BL35: @IF($A35=1,$H35*($G$58<=$E35)*($G$59>=$F35),$H35*($G$58<=$F35)*($G$59>=$E35))
BM35: @IF($A35=1,$H35*($G$59<=$E35)*($G$60>=$F35),$H35*($G$59<=$F35)*($G$60>=$E35))
BN35: @IF($A35=1,$H35*($G$60<=$E35)*($G$61>=$F35),$H35*($G$60<=$F35)*($G$61>=$E35))
BO35: @IF($A35=1,$H35*($G$61<=$E35)*($G$62>=$F35),$H35*($G$61<=$F35)*($G$62>=$E35))
BP35: @IF($A35=1,$H35*($G$62<=$E35)*($G$63>=$F35),$H35*($G$62<=$F35)*($G$63>=$E35))
BQ35: @IF($A35=1,$H35*($G$63<=$E35)*($G$64>=$F35),$H35*($G$63<=$F35)*($G$64>=$E35))
BR35: @IF($A35=1,$H35*($G$64<=$E35)*($G$65>=$F35),$H35*($G$64<=$F35)*($G$65>=$E35))
BS35: @IF($A35=1,$H35*($G$65<=$E35)*($G$66>=$F35),$H35*($G$65<=$F35)*($G$66>=$E35))
BT35: @IF($A35=1,$H35*($G$66<=$E35)*($G$67>=$F35),$H35*($G$66<=$F35)*($G$67>=$E35))
BU35: @IF($A35=1,$H35*($G$67<=$E35)*($G$68>=$F35),$H35*($G$67<=$F35)*($G$68>=$E35))
BV35: @IF($A35=1,$H35*($G$68<=$E35)*($G$69>=$F35),$H35*($G$68<=$F35)*($G$69>=$E35))
BW35: @IF($A35=1,$H35*($G$69<=$E35)*($G$70>=$F35),$H35*($G$69<=$F35)*($G$70>=$E35))
BX35: @IF($A35=1,$H35*($G$70<=$E35)*($G$71>=$F35),$H35*($G$70<=$F35)*($G$71>=$E35))
BY35: @IF($A35=1,$H35*($G$71<=$E35)*($G$72>=$F35),$H35*($G$71<=$F35)*($G$72>=$E35))
BZ35: @IF($A35=1,$H35*($G$72<=$E35)*($G$73>=$F35),$H35*($G$72<=$F35)*($G$73>=$E35))
P36: @IF($A36=1,$H36*($G$10<=$E36)*($G$11>=$F36),$H36*($G$10<=$F36)*($G$11>=$E36))
Q36: @IF($A36=1,$H36*($G$11<=$E36)*($G$12>=$F36),$H36*($G$11<=$F36)*($G$12>=$E36))
R36: @IF($A36=1,$H36*($G$12<=$E36)*($G$13>=$F36),$H36*($G$12<=$F36)*($G$13>=$E36))
S36: @IF($A36=1,$H36*($G$13<=$E36)*($G$14>=$F36),$H36*($G$13<=$F36)*($G$14>=$E36))
```

```
T36: @IF($A36=1,$H36*($G$14<=$E36)*($G$15>=$F36),$H36*($G$14<=$F36)*($G$15>=$E36))
U36: @IF($A36=1,$H36*($G$15<=$E36)*($G$16>=$F36),$H36*($G$15<=$F36)*($G$16>=$E36))
V36: @IF($A36=1,$H36*($G$16<=$E36)*($G$17>=$F36),$H36*($G$16<=$F36)*($G$17>=$E36))
W36: @IF($A36=1,$H36*($G$17<=$E36)*($G$18>=$F36),$H36*($G$17<=$F36)*($G$18>=$E36))
X36: @IF($A36=1,$H36*($G$18<=$E36)*($G$19>=$F36),$H36*($G$18<=$F36)*($G$19>=$E36))
Y36: @IF($A36=1,$H36*($G$19<=$E36)*($G$20>=$F36),$H36*($G$19<=$F36)*($G$20>=$E36))
Z36: @IF($A36=1,$H36*($G$20<=$E36)*($G$21>=$F36),$H36*($G$20<=$F36)*($G$21>=$E36))
AA36: @IF($A36=1,$H36*($G$21<=$E36)*($G$22>=$F36),$H36*($G$21<=$F36)*($G$22>=$E36))
AB36: @IF($A36=1,$H36*($G$22<=$E36)*($G$23>=$F36),$H36*($G$22<=$F36)*($G$23>=$E36))
AC36: @IF($A36=1,$H36*($G$23<=$E36)*($G$24>=$F36),$H36*($G$23<=$F36)*($G$24>=$E36))
AD36: @IF($A36=1,$H36*($G$24<=$E36)*($G$25>=$F36),$H36*($G$24<=$F36)*($G$25>=$E36))
AE36: @IF($A36=1,$H36*($G$25<=$E36)*($G$26>=$F36),$H36*($G$25<=$F36)*($G$26>=$E36))
AF36: @IF($A36=1,$H36*($G$26<=$E36)*($G$27>=$F36),$H36*($G$26<=$F36)*($G$27>=$E36))
AG36: @IF($A36=1,$H36*($G$27<=$E36)*($G$28>=$F36),$H36*($G$27<=$F36)*($G$28>=$E36))
AH36: @IF($A36=1,$H36*($G$28<=$E36)*($G$29>=$F36),$H36*($G$28<=$F36)*($G$29>=$E36))
AI36: @IF($A36=1,$H36*($G$29<=$E36)*($G$30>=$F36),$H36*($G$29<=$F36)*($G$30>=$E36))
AJ36: @IF($A36=1,$H36*($G$30<=$E36)*($G$31>=$F36),$H36*($G$30<=$F36)*($G$31>=$E36))
AK36: @IF($A36=1,$H36*($G$31<=$E36)*($G$32>=$F36),$H36*($G$31<=$F36)*($G$32>=$E36))
AL36: @IF($A36=1,$H36*($G$32<=$E36)*($G$33>=$F36),$H36*($G$32<=$F36)*($G$33>=$E36))
AM36: @IF($A36=1,$H36*($G$33<=$E36)*($G$34>=$F36),$H36*($G$33<=$F36)*($G$34>=$E36))
AN36: @IF($A36=1,$H36*($G$34<=$E36)*($G$35>=$F36),$H36*($G$34<=$F36)*($G$35>=$E36))
AO36: @IF($A36=1,$H36*($G$35<=$E36)*($G$36>=$F36),$H36*($G$35<=$F36)*($G$36>=$E36))
AP36: @IF($A36=1,$H36*($G$36<=$E36)*($G$37>=$F36),$H36*($G$36<=$F36)*($G$37>=$E36))
AQ36: @IF($A36=1,$H36*($G$37<=$E36)*($G$38>=$F36),$H36*($G$37<=$F36)*($G$38>=$E36))
AR36: @IF($A36=1,$H36*($G$38<=$E36)*($G$39>=$F36),$H36*($G$38<=$F36)*($G$39>=$E36))
AS36: @IF($A36=1,$H36*($G$39<=$E36)*($G$40>=$F36),$H36*($G$39<=$F36)*($G$40>=$E36))
AT36: @IF($A36=1,$H36*($G$40<=$E36)*($G$41>=$F36),$H36*($G$40<=$F36)*($G$41>=$E36))
AU36: @IF($A36=1,$H36*($G$41<=$E36)*($G$42>=$F36),$H36*($G$41<=$F36)*($G$42>=$E36))
AV36: @IF($A36=1,$H36*($G$42<=$E36)*($G$43>=$F36),$H36*($G$42<=$F36)*($G$43>=$E36))
AW36: @IF($A36=1,$H36*($G$43<=$E36)*($G$44>=$F36),$H36*($G$43<=$F36)*($G$44>=$E36))
AX36: @IF($A36=1,$H36*($G$44<=$E36)*($G$45>=$F36),$H36*($G$44<=$F36)*($G$45>=$E36))
AY36: @IF($A36=1,$H36*($G$45<=$E36)*($G$46>=$F36),$H36*($G$45<=$F36)*($G$46>=$E36))
AZ36: @IF($A36=1,$H36*($G$46<=$E36)*($G$47>=$F36),$H36*($G$46<=$F36)*($G$47>=$E36))
BA36: @IF($A36=1,$H36*($G$47<=$E36)*($G$48>=$F36),$H36*($G$47<=$F36)*($G$48>=$E36))
BB36: @IF($A36=1,$H36*($G$48<=$E36)*($G$49>=$F36),$H36*($G$48<=$F36)*($G$49>=$E36))
BC36: @IF($A36=1,$H36*($G$49<=$E36)*($G$50>=$F36),$H36*($G$49<=$F36)*($G$50>=$E36))
BD36: @IF($A36=1,$H36*($G$50<=$E36)*($G$51>=$F36),$H36*($G$50<=$F36)*($G$51>=$E36))
BE36: @IF($A36=1,$H36*($G$51<=$E36)*($G$52>=$F36),$H36*($G$51<=$F36)*($G$52>=$E36))
BF36: @IF($A36=1,$H36*($G$52<=$E36)*($G$53>=$F36),$H36*($G$52<=$F36)*($G$53>=$E36))
BG36: @IF($A36=1,$H36*($G$53<=$E36)*($G$54>=$F36),$H36*($G$53<=$F36)*($G$54>=$E36))
BH36: @IF($A36=1,$H36*($G$54<=$E36)*($G$55>=$F36),$H36*($G$54<=$F36)*($G$55>=$E36))
BI36: @IF($A36=1,$H36*($G$55<=$E36)*($G$56>=$F36),$H36*($G$55<=$F36)*($G$56>=$E36))
BJ36: @IF($A36=1,$H36*($G$56<=$E36)*($G$57>=$F36),$H36*($G$56<=$F36)*($G$57>=$E36))
BK36: @IF($A36=1,$H36*($G$57<=$E36)*($G$58>=$F36),$H36*($G$57<=$F36)*($G$58>=$E36))
BL36: @IF($A36=1,$H36*($G$58<=$E36)*($G$59>=$F36),$H36*($G$58<=$F36)*($G$59>=$E36))
BM36: @IF($A36=1,$H36*($G$59<=$E36)*($G$60>=$F36),$H36*($G$59<=$F36)*($G$60>=$E36))
BN36: @IF($A36=1,$H36*($G$60<=$E36)*($G$61>=$F36),$H36*($G$60<=$F36)*($G$61>=$E36))
BO36: @IF($A36=1,$H36*($G$61<=$E36)*($G$62>=$F36),$H36*($G$61<=$F36)*($G$62>=$E36))
BP36: @IF($A36=1,$H36*($G$62<=$E36)*($G$63>=$F36),$H36*($G$62<=$F36)*($G$63>=$E36))
BQ36: @IF($A36=1,$H36*($G$63<=$E36)*($G$64>=$F36),$H36*($G$63<=$F36)*($G$64>=$E36))
BR36: @IF($A36=1,$H36*($G$64<=$E36)*($G$65>=$F36),$H36*($G$64<=$F36)*($G$65>=$E36))
BS36: @IF($A36=1,$H36*($G$65<=$E36)*($G$66>=$F36),$H36*($G$65<=$F36)*($G$66>=$E36))
BT36: @IF($A36=1,$H36*($G$66<=$E36)*($G$67>=$F36),$H36*($G$66<=$F36)*($G$67>=$E36))
BU36: @IF($A36=1,$H36*($G$67<=$E36)*($G$68>=$F36),$H36*($G$67<=$F36)*($G$68>=$E36))
BV36: @IF($A36=1,$H36*($G$68<=$E36)*($G$69>=$F36),$H36*($G$68<=$F36)*($G$69>=$E36))
BW36: @IF($A36=1,$H36*($G$69<=$E36)*($G$70>=$F36),$H36*($G$69<=$F36)*($G$70>=$E36))
```

```
BX36: @IF($A36=1,$H36*($G$70<=$E36)*($G$71>=$F36),$H36*($G$70<=$F36)*($G$71>=$E36))
BY36: @IF($A36=1,$H36*($G$71<=$E36)*($G$72>=$F36),$H36*($G$71<=$F36)*($G$72>=$E36))
BZ36: @IF($A36=1,$H36*($G$72<=$E36)*($G$73>=$F36),$H36*($G$72<=$F36)*($G$73>=$E36))
P37: @IF($A37=1,$H37*($G$10<=$E37)*($G$11>=$F37),$H37*($G$10<=$F37)*($G$11>=$E37))
Q37: @IF($A37=1,$H37*($G$11<=$E37)*($G$12>=$F37),$H37*($G$11<=$F37)*($G$12>=$E37))
R37: @IF($A37=1,$H37*($G$12<=$E37)*($G$13>=$F37),$H37*($G$12<=$F37)*($G$13>=$E37))
S37: @IF($A37=1,$H37*($G$13<=$E37)*($G$14>=$F37),$H37*($G$13<=$F37)*($G$14>=$E37))
T37: @IF($A37=1,$H37*($G$14<=$E37)*($G$15>=$F37),$H37*($G$14<=$F37)*($G$15>=$E37))
U37: @IF($A37=1,$H37*($G$15<=$E37)*($G$16>=$F37),$H37*($G$15<=$F37)*($G$16>=$E37))
V37: @IF($A37=1,$H37*($G$16<=$E37)*($G$17>=$F37),$H37*($G$16<=$F37)*($G$17>=$E37))
W37: @IF($A37=1,$H37*($G$17<=$E37)*($G$18>=$F37),$H37*($G$17<=$F37)*($G$18>=$E37))
X37: @IF($A37=1,$H37*($G$18<=$E37)*($G$19>=$F37),$H37*($G$18<=$F37)*($G$19>=$E37))
Y37: @IF($A37=1,$H37*($G$19<=$E37)*($G$20>=$F37),$H37*($G$19<=$F37)*($G$20>=$E37))
Z37: @IF($A37=1,$H37*($G$20<=$E37)*($G$21>=$F37),$H37*($G$20<=$F37)*($G$21>=$E37))
AA37: @IF($A37=1,$H37*($G$21<=$E37)*($G$22>=$F37),$H37*($G$21<=$F37)*($G$22>=$E37))
AB37: @IF($A37=1,$H37*($G$22<=$E37)*($G$23>=$F37),$H37*($G$22<=$F37)*($G$23>=$E37))
AC37: @IF($A37=1,$H37*($G$23<=$E37)*($G$24>=$F37),$H37*($G$23<=$F37)*($G$24>=$E37))
AD37: @IF($A37=1,$H37*($G$24<=$E37)*($G$25>=$F37),$H37*($G$24<=$F37)*($G$25>=$E37))
AE37: @IF($A37=1,$H37*($G$25<=$E37)*($G$26>=$F37),$H37*($G$25<=$F37)*($G$26>=$E37))
AF37: @IF($A37=1,$H37*($G$26<=$E37)*($G$27>=$F37),$H37*($G$26<=$F37)*($G$27>=$E37))
AG37: @IF($A37=1,$H37*($G$27<=$E37)*($G$28>=$F37),$H37*($G$27<=$F37)*($G$28>=$E37))
AH37: @IF($A37=1,$H37*($G$28<=$E37)*($G$29>=$F37),$H37*($G$28<=$F37)*($G$29>=$E37))
AI37: @IF($A37=1,$H37*($G$29<=$E37)*($G$30>=$F37),$H37*($G$29<=$F37)*($G$30>=$E37))
AJ37: @IF($A37=1,$H37*($G$30<=$E37)*($G$31>=$F37),$H37*($G$30<=$F37)*($G$31>=$E37))
AK37: @IF($A37=1,$H37*($G$31<=$E37)*($G$32>=$F37),$H37*($G$31<=$F37)*($G$32>=$E37))
AL37: @IF($A37=1,$H37*($G$32<=$E37)*($G$33>=$F37),$H37*($G$32<=$F37)*($G$33>=$E37))
AM37: @IF($A37=1,$H37*($G$33<=$E37)*($G$34>=$F37),$H37*($G$33<=$F37)*($G$34>=$E37))
AN37: @IF($A37=1,$H37*($G$34<=$E37)*($G$35>=$F37),$H37*($G$34<=$F37)*($G$35>=$E37))
AO37: @IF($A37=1,$H37*($G$35<=$E37)*($G$36>=$F37),$H37*($G$35<=$F37)*($G$36>=$E37))
AP37: @IF($A37=1,$H37*($G$36<=$E37)*($G$37>=$F37),$H37*($G$36<=$F37)*($G$37>=$E37))
AQ37: @IF($A37=1,$H37*($G$37<=$E37)*($G$38>=$F37),$H37*($G$37<=$F37)*($G$38>=$E37))
AR37: @IF($A37=1,$H37*($G$38<=$E37)*($G$39>=$F37),$H37*($G$38<=$F37)*($G$39>=$E37))
AS37: @IF($A37=1,$H37*($G$39<=$E37)*($G$40>=$F37),$H37*($G$39<=$F37)*($G$40>=$E37))
AT37: @IF($A37=1,$H37*($G$40<=$E37)*($G$41>=$F37),$H37*($G$40<=$F37)*($G$41>=$E37))
AU37: @IF($A37=1,$H37*($G$41<=$E37)*($G$42>=$F37),$H37*($G$41<=$F37)*($G$42>=$E37))
AV37: @IF($A37=1,$H37*($G$42<=$E37)*($G$43>=$F37),$H37*($G$42<=$F37)*($G$43>=$E37))
AW37: @IF($A37=1,$H37*($G$43<=$E37)*($G$44>=$F37),$H37*($G$43<=$F37)*($G$44>=$E37))
AX37: @IF($A37=1,$H37*($G$44<=$E37)*($G$45>=$F37),$H37*($G$44<=$F37)*($G$45>=$E37))
AY37: @IF($A37=1,$H37*($G$45<=$E37)*($G$46>=$F37),$H37*($G$45<=$F37)*($G$46>=$E37))
AZ37: @IF($A37=1,$H37*($G$46<=$E37)*($G$47>=$F37),$H37*($G$46<=$F37)*($G$47>=$E37))
BA37: @IF($A37=1,$H37*($G$47<=$E37)*($G$48>=$F37),$H37*($G$47<=$F37)*($G$48>=$E37))
BB37: @IF($A37=1,$H37*($G$48<=$E37)*($G$49>=$F37),$H37*($G$48<=$F37)*($G$49>=$E37))
BC37: @IF($A37=1,$H37*($G$49<=$E37)*($G$50>=$F37),$H37*($G$49<=$F37)*($G$50>=$E37))
BD37: @IF($A37=1,$H37*($G$50<=$E37)*($G$51>=$F37),$H37*($G$50<=$F37)*($G$51>=$E37))
BE37: @IF($A37=1,$H37*($G$51<=$E37)*($G$52>=$F37),$H37*($G$51<=$F37)*($G$52>=$E37))
BF37: @IF($A37=1,$H37*($G$52<=$E37)*($G$53>=$F37),$H37*($G$52<=$F37)*($G$53>=$E37))
BG37: @IF($A37=1,$H37*($G$53<=$E37)*($G$54>=$F37),$H37*($G$53<=$F37)*($G$54>=$E37))
BH37: @IF($A37=1,$H37*($G$54<=$E37)*($G$55>=$F37),$H37*($G$54<=$F37)*($G$55>=$E37))
BI37: @IF($A37=1,$H37*($G$55<=$E37)*($G$56>=$F37),$H37*($G$55<=$F37)*($G$56>=$E37))
BJ37: @IF($A37=1,$H37*($G$56<=$E37)*($G$57>=$F37),$H37*($G$56<=$F37)*($G$57>=$E37))
BK37: @IF($A37=1,$H37*($G$57<=$E37)*($G$58>=$F37),$H37*($G$57<=$F37)*($G$58>=$E37))
BL37: @IF($A37=1,$H37*($G$58<=$E37)*($G$59>=$F37),$H37*($G$58<=$F37)*($G$59>=$E37))
BM37: @IF($A37=1,$H37*($G$59<=$E37)*($G$60>=$F37),$H37*($G$59<=$F37)*($G$60>=$E37))
BN37: @IF($A37=1,$H37*($G$60<=$E37)*($G$61>=$F37),$H37*($G$60<=$F37)*($G$61>=$E37))
BO37: @IF($A37=1,$H37*($G$61<=$E37)*($G$62>=$F37),$H37*($G$61<=$F37)*($G$62>=$E37))
BP37: @IF($A37=1,$H37*($G$62<=$E37)*($G$63>=$F37),$H37*($G$62<=$F37)*($G$63>=$E37))
```

```
BQ37: @IF($A37=1,$H37*($G$63<=$E37)*($G$64>=$F37),$H37*($G$63<=$F37)*($G$64>=$E37))
BR37: @IF($A37=1,$H37*($G$64<=$E37)*($G$65>=$F37),$H37*($G$64<=$F37)*($G$65>=$E37))
BS37: @IF($A37=1,$H37*($G$65<=$E37)*($G$66>=$F37),$H37*($G$65<=$F37)*($G$66>=$E37))
BT37: @IF($A37=1,$H37*($G$66<=$E37)*($G$67>=$F37),$H37*($G$66<=$F37)*($G$67>=$E37))
BU37: @IF($A37=1,$H37*($G$67<=$E37)*($G$68>=$F37),$H37*($G$67<=$F37)*($G$68>=$E37))
BV37: @IF($A37=1,$H37*($G$68<=$E37)*($G$69>=$F37),$H37*($G$68<=$F37)*($G$69>=$E37))
BW37: @IF($A37=1,$H37*($G$69<=$E37)*($G$70>=$F37),$H37*($G$69<=$F37)*($G$70>=$E37))
BX37: @IF($A37=1,$H37*($G$70<=$E37)*($G$71>=$F37),$H37*($G$70<=$F37)*($G$71>=$E37))
BY37: @IF($A37=1,$H37*($G$71<=$E37)*($G$72>=$F37),$H37*($G$71<=$F37)*($G$72>=$E37))
BZ37: @IF($A37=1,$H37*($G$72<=$E37)*($G$73>=$F37),$H37*($G$72<=$F37)*($G$73>=$E37))
P38: @IF($A38=1,$H38*($G$10<=$E38)*($G$11>=$F38),$H38*($G$10<=$F38)*($G$11>=$E38))
Q38: @IF($A38=1,$H38*($G$11<=$E38)*($G$12>=$F38),$H38*($G$11<=$F38)*($G$12>=$E38))
R38: @IF($A38=1,$H38*($G$12<=$E38)*($G$13>=$F38),$H38*($G$12<=$F38)*($G$13>=$E38))
S38: @IF($A38=1,$H38*($G$13<=$E38)*($G$14>=$F38),$H38*($G$13<=$F38)*($G$14>=$E38))
T38: @IF($A38=1,$H38*($G$14<=$E38)*($G$15>=$F38),$H38*($G$14<=$F38)*($G$15>=$E38))
U38: @IF($A38=1,$H38*($G$15<=$E38)*($G$16>=$F38),$H38*($G$15<=$F38)*($G$16>=$E38))
V38: @IF($A38=1,$H38*($G$16<=$E38)*($G$17>=$F38),$H38*($G$16<=$F38)*($G$17>=$E38))
W38: @IF($A38=1,$H38*($G$17<=$E38)*($G$18>=$F38),$H38*($G$17<=$F38)*($G$18>=$E38))
X38: @IF($A38=1,$H38*($G$18<=$E38)*($G$19>=$F38),$H38*($G$18<=$F38)*($G$19>=$E38))
Y38: @IF($A38=1,$H38*($G$19<=$E38)*($G$20>=$F38),$H38*($G$19<=$F38)*($G$20>=$E38))
Z38: @IF($A38=1,$H38*($G$20<=$E38)*($G$21>=$F38),$H38*($G$20<=$F38)*($G$21>=$E38))
AA38: @IF($A38=1,$H38*($G$21<=$E38)*($G$22>=$F38),$H38*($G$21<=$F38)*($G$22>=$E38))
AB38: @IF($A38=1,$H38*($G$22<=$E38)*($G$23>=$F38),$H38*($G$22<=$F38)*($G$23>=$E38))
AC38: @IF($A38=1,$H38*($G$23<=$E38)*($G$24>=$F38),$H38*($G$23<=$F38)*($G$24>=$E38))
AD38: @IF($A38=1,$H38*($G$24<=$E38)*($G$25>=$F38),$H38*($G$24<=$F38)*($G$25>=$E38))
AE38: @IF($A38=1,$H38*($G$25<=$E38)*($G$26>=$F38),$H38*($G$25<=$F38)*($G$26>=$E38))
AF38: @IF($A38=1,$H38*($G$26<=$E38)*($G$27>=$F38),$H38*($G$26<=$F38)*($G$27>=$E38))
AG38: @IF($A38=1,$H38*($G$27<=$E38)*($G$28>=$F38),$H38*($G$27<=$F38)*($G$28>=$E38))
AH38: @IF($A38=1,$H38*($G$28<=$E38)*($G$29>=$F38),$H38*($G$28<=$F38)*($G$29>=$E38))
AI38: @IF($A38=1,$H38*($G$29<=$E38)*($G$30>=$F38),$H38*($G$29<=$F38)*($G$30>=$E38))
AJ38: @IF($A38=1,$H38*($G$30<=$E38)*($G$31>=$F38),$H38*($G$30<=$F38)*($G$31>=$E38))
AK38: @IF($A38=1,$H38*($G$31<=$E38)*($G$32>=$F38),$H38*($G$31<=$F38)*($G$32>=$E38))
AL38: @IF($A38=1,$H38*($G$32<=$E38)*($G$33>=$F38),$H38*($G$32<=$F38)*($G$33>=$E38))
AM38: @IF($A38=1,$H38*($G$33<=$E38)*($G$34>=$F38),$H38*($G$33<=$F38)*($G$34>=$E38))
AN38: @IF($A38=1,$H38*($G$34<=$E38)*($G$35>=$F38),$H38*($G$34<=$F38)*($G$35>=$E38))
AO38: @IF($A38=1,$H38*($G$35<=$E38)*($G$36>=$F38),$H38*($G$35<=$F38)*($G$36>=$E38))
AP38: @IF($A38=1,$H38*($G$36<=$E38)*($G$37>=$F38),$H38*($G$36<=$F38)*($G$37>=$E38))
AQ38: @IF($A38=1,$H38*($G$37<=$E38)*($G$38>=$F38),$H38*($G$37<=$F38)*($G$38>=$E38))
AR38: @IF($A38=1,$H38*($G$38<=$E38)*($G$39>=$F38),$H38*($G$38<=$F38)*($G$39>=$E38))
AS38: @IF($A38=1,$H38*($G$39<=$E38)*($G$40>=$F38),$H38*($G$39<=$F38)*($G$40>=$E38))
AT38: @IF($A38=1,$H38*($G$40<=$E38)*($G$41>=$F38),$H38*($G$40<=$F38)*($G$41>=$E38))
AU38: @IF($A38=1,$H38*($G$41<=$E38)*($G$42>=$F38),$H38*($G$41<=$F38)*($G$42>=$E38))
AV38: @IF($A38=1,$H38*($G$42<=$E38)*($G$43>=$F38),$H38*($G$42<=$F38)*($G$43>=$E38))
AW38: @IF($A38=1,$H38*($G$43<=$E38)*($G$44>=$F38),$H38*($G$43<=$F38)*($G$44>=$E38))
AX38: @IF($A38=1,$H38*($G$44<=$E38)*($G$45>=$F38),$H38*($G$44<=$F38)*($G$45>=$E38))
AY38: @IF($A38=1,$H38*($G$45<=$E38)*($G$46>=$F38),$H38*($G$45<=$F38)*($G$46>=$E38))
AZ38: @IF($A38=1,$H38*($G$46<=$E38)*($G$47>=$F38),$H38*($G$46<=$F38)*($G$47>=$E38))
BA38: @IF($A38=1,$H38*($G$47<=$E38)*($G$48>=$F38),$H38*($G$47<=$F38)*($G$48>=$E38))
BB38: @IF($A38=1,$H38*($G$48<=$E38)*($G$49>=$F38),$H38*($G$48<=$F38)*($G$49>=$E38))
BC38: @IF($A38=1,$H38*($G$49<=$E38)*($G$50>=$F38),$H38*($G$49<=$F38)*($G$50>=$E38))
BD38: @IF($A38=1,$H38*($G$50<=$E38)*($G$51>=$F38),$H38*($G$50<=$F38)*($G$51>=$E38))
BE38: @IF($A38=1,$H38*($G$51<=$E38)*($G$52>=$F38),$H38*($G$51<=$F38)*($G$52>=$E38))
BF38: @IF($A38=1,$H38*($G$52<=$E38)*($G$53>=$F38),$H38*($G$52<=$F38)*($G$53>=$E38))
BG38: @IF($A38=1,$H38*($G$53<=$E38)*($G$54>=$F38),$H38*($G$53<=$F38)*($G$54>=$E38))
BH38: @IF($A38=1,$H38*($G$54<=$E38)*($G$55>=$F38),$H38*($G$54<=$F38)*($G$55>=$E38))
BI38: @IF($A38=1,$H38*($G$55<=$E38)*($G$56>=$F38),$H38*($G$55<=$F38)*($G$56>=$E38))
```

```
BJ38: @IF($A38=1,$H38*($G$56<=$E38)*($G$57>=$F38),$H38*($G$56<=$F38)*($G$57>=$E38))
BK38: @IF($A38=1,$H38*($G$57<=$E38)*($G$58>=$F38),$H38*($G$57<=$F38)*($G$58>=$E38))
BL38: @IF($A38=1,$H38*($G$58<=$E38)*($G$59>=$F38),$H38*($G$58<=$F38)*($G$59>=$E38))
BM38: @IF($A38=1,$H38*($G$59<=$E38)*($G$60>=$F38),$H38*($G$59<=$F38)*($G$60>=$E38))
BN38: @IF($A38=1,$H38*($G$60<=$E38)*($G$61>=$F38),$H38*($G$60<=$F38)*($G$61>=$E38))
BO38: @IF($A38=1,$H38*($G$61<=$E38)*($G$62>=$F38),$H38*($G$61<=$F38)*($G$62>=$E38))
BP38: @IF($A38=1,$H38*($G$62<=$E38)*($G$63>=$F38),$H38*($G$62<=$F38)*($G$63>=$E38))
BQ38: @IF($A38=1,$H38*($G$63<=$E38)*($G$64>=$F38),$H38*($G$63<=$F38)*($G$64>=$E38))
BR38: @IF($A38=1,$H38*($G$64<=$E38)*($G$65>=$F38),$H38*($G$64<=$F38)*($G$65>=$E38))
BS38: @IF($A38=1,$H38*($G$65<=$E38)*($G$66>=$F38),$H38*($G$65<=$F38)*($G$66>=$E38))
BT38: @IF($A38=1,$H38*($G$66<=$E38)*($G$67>=$F38),$H38*($G$66<=$F38)*($G$67>=$E38))
BU38: @IF($A38=1,$H38*($G$67<=$E38)*($G$68>=$F38),$H38*($G$67<=$F38)*($G$68>=$E38))
BV38: @IF($A38=1,$H38*($G$68<=$E38)*($G$69>=$F38),$H38*($G$68<=$F38)*($G$69>=$E38))
BW38: @IF($A38=1,$H38*($G$69<=$E38)*($G$70>=$F38),$H38*($G$69<=$F38)*($G$70>=$E38))
BX38: @IF($A38=1,$H38*($G$70<=$E38)*($G$71>=$F38),$H38*($G$70<=$F38)*($G$71>=$E38))
BY38: @IF($A38=1,$H38*($G$71<=$E38)*($G$72>=$F38),$H38*($G$71<=$F38)*($G$72>=$E38))
BZ38: @IF($A38=1,$H38*($G$72<=$E38)*($G$73>=$F38),$H38*($G$72<=$F38)*($G$73>=$E38))
P39: @IF($A39=1,$H39*($G$10<=$E39)*($G$11>=$F39),$H39*($G$10<=$F39)*($G$11>=$E39))
Q39: @IF($A39=1,$H39*($G$11<=$E39)*($G$12>=$F39),$H39*($G$11<=$F39)*($G$12>=$E39))
R39: @IF($A39=1,$H39*($G$12<=$E39)*($G$13>=$F39),$H39*($G$12<=$F39)*($G$13>=$E39))
S39: @IF($A39=1,$H39*($G$13<=$E39)*($G$14>=$F39),$H39*($G$13<=$F39)*($G$14>=$E39))
T39: @IF($A39=1,$H39*($G$14<=$E39)*($G$15>=$F39),$H39*($G$14<=$F39)*($G$15>=$E39))
U39: @IF($A39=1,$H39*($G$15<=$E39)*($G$16>=$F39),$H39*($G$15<=$F39)*($G$16>=$E39))
V39: @IF($A39=1,$H39*($G$16<=$E39)*($G$17>=$F39),$H39*($G$16<=$F39)*($G$17>=$E39))
W39: @IF($A39=1,$H39*($G$17<=$E39)*($G$18>=$F39),$H39*($G$17<=$F39)*($G$18>=$E39))
X39: @IF($A39=1,$H39*($G$18<=$E39)*($G$19>=$F39),$H39*($G$18<=$F39)*($G$19>=$E39))
Y39: @IF($A39=1,$H39*($G$19<=$E39)*($G$20>=$F39),$H39*($G$19<=$F39)*($G$20>=$E39))
Z39: @IF($A39=1,$H39*($G$20<=$E39)*($G$21>=$F39),$H39*($G$20<=$F39)*($G$21>=$E39))
AA39: @IF($A39=1,$H39*($G$21<=$E39)*($G$22>=$F39),$H39*($G$21<=$F39)*($G$22>=$E39))
AB39: @IF($A39=1,$H39*($G$22<=$E39)*($G$23>=$F39),$H39*($G$22<=$F39)*($G$23>=$E39))
AC39: @IF($A39=1,$H39*($G$23<=$E39)*($G$24>=$F39),$H39*($G$23<=$F39)*($G$24>=$E39))
AD39: @IF($A39=1,$H39*($G$24<=$E39)*($G$25>=$F39),$H39*($G$24<=$F39)*($G$25>=$E39))
AE39: @IF($A39=1,$H39*($G$25<=$E39)*($G$26>=$F39),$H39*($G$25<=$F39)*($G$26>=$E39))
AF39: @IF($A39=1,$H39*($G$26<=$E39)*($G$27>=$F39),$H39*($G$26<=$F39)*($G$27>=$E39))
AG39: @IF($A39=1,$H39*($G$27<=$E39)*($G$28>=$F39),$H39*($G$27<=$F39)*($G$28>=$E39))
AH39: @IF($A39=1,$H39*($G$28<=$E39)*($G$29>=$F39),$H39*($G$28<=$F39)*($G$29>=$E39))
AI39: @IF($A39=1,$H39*($G$29<=$E39)*($G$30>=$F39),$H39*($G$29<=$F39)*($G$30>=$E39))
AJ39: @IF($A39=1,$H39*($G$30<=$E39)*($G$31>=$F39),$H39*($G$30<=$F39)*($G$31>=$E39))
AK39: @IF($A39=1,$H39*($G$31<=$E39)*($G$32>=$F39),$H39*($G$31<=$F39)*($G$32>=$E39))
AL39: @IF($A39=1,$H39*($G$32<=$E39)*($G$33>=$F39),$H39*($G$32<=$F39)*($G$33>=$E39))
AM39: @IF($A39=1,$H39*($G$33<=$E39)*($G$34>=$F39),$H39*($G$33<=$F39)*($G$34>=$E39))
AN39: @IF($A39=1,$H39*($G$34<=$E39)*($G$35>=$F39),$H39*($G$34<=$F39)*($G$35>=$E39))
AO39: @IF($A39=1,$H39*($G$35<=$E39)*($G$36>=$F39),$H39*($G$35<=$F39)*($G$36>=$E39))
AP39: @IF($A39=1,$H39*($G$36<=$E39)*($G$37>=$F39),$H39*($G$36<=$F39)*($G$37>=$E39))
AQ39: @IF($A39=1,$H39*($G$37<=$E39)*($G$38>=$F39),$H39*($G$37<=$F39)*($G$38>=$E39))
AR39: @IF($A39=1,$H39*($G$38<=$E39)*($G$39>=$F39),$H39*($G$38<=$F39)*($G$39>=$E39))
AS39: @IF($A39=1,$H39*($G$39<=$E39)*($G$40>=$F39),$H39*($G$39<=$F39)*($G$40>=$E39))
AT39: @IF($A39=1,$H39*($G$40<=$E39)*($G$41>=$F39),$H39*($G$40<=$F39)*($G$41>=$E39))
AU39: @IF($A39=1,$H39*($G$41<=$E39)*($G$42>=$F39),$H39*($G$41<=$F39)*($G$42>=$E39))
AV39: @IF($A39=1,$H39*($G$42<=$E39)*($G$43>=$F39),$H39*($G$42<=$F39)*($G$43>=$E39))
AW39: @IF($A39=1,$H39*($G$43<=$E39)*($G$44>=$F39),$H39*($G$43<=$F39)*($G$44>=$E39))
AX39: @IF($A39=1,$H39*($G$44<=$E39)*($G$45>=$F39),$H39*($G$44<=$F39)*($G$45>=$E39))
AY39: @IF($A39=1,$H39*($G$45<=$E39)*($G$46>=$F39),$H39*($G$45<=$F39)*($G$46>=$E39))
AZ39: @IF($A39=1,$H39*($G$46<=$E39)*($G$47>=$F39),$H39*($G$46<=$F39)*($G$47>=$E39))
BA39: @IF($A39=1,$H39*($G$47<=$E39)*($G$48>=$F39),$H39*($G$47<=$F39)*($G$48>=$E39))
BB39: @IF($A39=1,$H39*($G$48<=$E39)*($G$49>=$F39),$H39*($G$48<=$F39)*($G$49>=$E39))
```

```
BC39: @IF($A39=1,$H39*($G$49<=$E39)*($G$50>=$F39),$H39*($G$49<=$F39)*($G$50>=$E39))
BD39: @IF($A39=1,$H39*($G$50<=$E39)*($G$51>=$F39),$H39*($G$50<=$F39)*($G$51>=$E39))
BE39: @IF($A39=1,$H39*($G$51<=$E39)*($G$52>=$F39),$H39*($G$51<=$F39)*($G$52>=$E39))
BF39: @IF($A39=1,$H39*($G$52<=$E39)*($G$53>=$F39),$H39*($G$52<=$F39)*($G$53>=$E39))
BG39: @IF($A39=1,$H39*($G$53<=$E39)*($G$54>=$F39),$H39*($G$53<=$F39)*($G$54>=$E39))
BH39: @IF($A39=1,$H39*($G$54<=$E39)*($G$55>=$F39),$H39*($G$54<=$F39)*($G$55>=$E39))
BI39: @IF($A39=1,$H39*($G$55<=$E39)*($G$56>=$F39),$H39*($G$55<=$F39)*($G$56>=$E39))
BJ39: @IF($A39=1,$H39*($G$56<=$E39)*($G$57>=$F39),$H39*($G$56<=$F39)*($G$57>=$E39))
BK39: @IF($A39=1,$H39*($G$57<=$E39)*($G$58>=$F39),$H39*($G$57<=$F39)*($G$58>=$E39))
BL39: @IF($A39=1,$H39*($G$58<=$E39)*($G$59>=$F39),$H39*($G$58<=$F39)*($G$59>=$E39))
BM39: @IF($A39=1,$H39*($G$59<=$E39)*($G$60>=$F39),$H39*($G$59<=$F39)*($G$60>=$E39))
BN39: @IF($A39=1,$H39*($G$60<=$E39)*($G$61>=$F39),$H39*($G$60<=$F39)*($G$61>=$E39))
BO39: @IF($A39=1,$H39*($G$61<=$E39)*($G$62>=$F39),$H39*($G$61<=$F39)*($G$62>=$E39))
BP39: @IF($A39=1,$H39*($G$62<=$E39)*($G$63>=$F39),$H39*($G$62<=$F39)*($G$63>=$E39))
BQ39: @IF($A39=1,$H39*($G$63<=$E39)*($G$64>=$F39),$H39*($G$63<=$F39)*($G$64>=$E39))
BR39: @IF($A39=1,$H39*($G$64<=$E39)*($G$65>=$F39),$H39*($G$64<=$F39)*($G$65>=$E39))
BS39: @IF($A39=1,$H39*($G$65<=$E39)*($G$66>=$F39),$H39*($G$65<=$F39)*($G$66>=$E39))
BT39: @IF($A39=1,$H39*($G$66<=$E39)*($G$67>=$F39),$H39*($G$66<=$F39)*($G$67>=$E39))
BU39: @IF($A39=1,$H39*($G$67<=$E39)*($G$68>=$F39),$H39*($G$67<=$F39)*($G$68>=$E39))
BV39: @IF($A39=1,$H39*($G$68<=$E39)*($G$69>=$F39),$H39*($G$68<=$F39)*($G$69>=$E39))
BW39: @IF($A39=1,$H39*($G$69<=$E39)*($G$70>=$F39),$H39*($G$69<=$F39)*($G$70>=$E39))
BX39: @IF($A39=1,$H39*($G$70<=$E39)*($G$71>=$F39),$H39*($G$70<=$F39)*($G$71>=$E39))
BY39: @IF($A39=1,$H39*($G$71<=$E39)*($G$72>=$F39),$H39*($G$71<=$F39)*($G$72>=$E39))
BZ39: @IF($A39=1,$H39*($G$72<=$E39)*($G$73>=$F39),$H39*($G$72<=$F39)*($G$73>=$E39))
P40: @IF($A40=1,$H40*($G$10<=$E40)*($G$11>=$F40),$H40*($G$10<=$F40)*($G$11>=$E40))
Q40: @IF($A40=1,$H40*($G$11<=$E40)*($G$12>=$F40),$H40*($G$11<=$F40)*($G$12>=$E40))
R40: @IF($A40=1,$H40*($G$12<=$E40)*($G$13>=$F40),$H40*($G$12<=$F40)*($G$13>=$E40))
S40: @IF($A40=1,$H40*($G$13<=$E40)*($G$14>=$F40),$H40*($G$13<=$F40)*($G$14>=$E40))
T40: @IF($A40=1,$H40*($G$14<=$E40)*($G$15>=$F40),$H40*($G$14<=$F40)*($G$15>=$E40))
U40: @IF($A40=1,$H40*($G$15<=$E40)*($G$16>=$F40),$H40*($G$15<=$F40)*($G$16>=$E40))
V40: @IF($A40=1,$H40*($G$16<=$E40)*($G$17>=$F40),$H40*($G$16<=$F40)*($G$17>=$E40))
W40: @IF($A40=1,$H40*($G$17<=$E40)*($G$18>=$F40),$H40*($G$17<=$F40)*($G$18>=$E40))
X40: @IF($A40=1,$H40*($G$18<=$E40)*($G$19>=$F40),$H40*($G$18<=$F40)*($G$19>=$E40))
Y40: @IF($A40=1,$H40*($G$19<=$E40)*($G$20>=$F40),$H40*($G$19<=$F40)*($G$20>=$E40))
Z40: @IF($A40=1,$H40*($G$20<=$E40)*($G$21>=$F40),$H40*($G$20<=$F40)*($G$21>=$E40))
AA40: @IF($A40=1,$H40*($G$21<=$E40)*($G$22>=$F40),$H40*($G$21<=$F40)*($G$22>=$E40))
AB40: @IF($A40=1,$H40*($G$22<=$E40)*($G$23>=$F40),$H40*($G$22<=$F40)*($G$23>=$E40))
AC40: @IF($A40=1,$H40*($G$23<=$E40)*($G$24>=$F40),$H40*($G$23<=$F40)*($G$24>=$E40))
AD40: @IF($A40=1,$H40*($G$24<=$E40)*($G$25>=$F40),$H40*($G$24<=$F40)*($G$25>=$E40))
AE40: @IF($A40=1,$H40*($G$25<=$E40)*($G$26>=$F40),$H40*($G$25<=$F40)*($G$26>=$E40))
AF40: @IF($A40=1,$H40*($G$26<=$E40)*($G$27>=$F40),$H40*($G$26<=$F40)*($G$27>=$E40))
AG40: @IF($A40=1,$H40*($G$27<=$E40)*($G$28>=$F40),$H40*($G$27<=$F40)*($G$28>=$E40))
AH40: @IF($A40=1,$H40*($G$28<=$E40)*($G$29>=$F40),$H40*($G$28<=$F40)*($G$29>=$E40))
AI40: @IF($A40=1,$H40*($G$29<=$E40)*($G$30>=$F40),$H40*($G$29<=$F40)*($G$30>=$E40))
AJ40: @IF($A40=1,$H40*($G$30<=$E40)*($G$31>=$F40),$H40*($G$30<=$F40)*($G$31>=$E40))
AK40: @IF($A40=1,$H40*($G$31<=$E40)*($G$32>=$F40),$H40*($G$31<=$F40)*($G$32>=$E40))
AL40: @IF($A40=1,$H40*($G$32<=$E40)*($G$33>=$F40),$H40*($G$32<=$F40)*($G$33>=$E40))
AM40: @IF($A40=1,$H40*($G$33<=$E40)*($G$34>=$F40),$H40*($G$33<=$F40)*($G$34>=$E40))
AN40: @IF($A40=1,$H40*($G$34<=$E40)*($G$35>=$F40),$H40*($G$34<=$F40)*($G$35>=$E40))
AO40: @IF($A40=1,$H40*($G$35<=$E40)*($G$36>=$F40),$H40*($G$35<=$F40)*($G$36>=$E40))
AP40: @IF($A40=1,$H40*($G$36<=$E40)*($G$37>=$F40),$H40*($G$36<=$F40)*($G$37>=$E40))
AQ40: @IF($A40=1,$H40*($G$37<=$E40)*($G$38>=$F40),$H40*($G$37<=$F40)*($G$38>=$E40))
AR40: @IF($A40=1,$H40*($G$38<=$E40)*($G$39>=$F40),$H40*($G$38<=$F40)*($G$39>=$E40))
AS40: @IF($A40=1,$H40*($G$39<=$E40)*($G$40>=$F40),$H40*($G$39<=$F40)*($G$40>=$E40))
AT40: @IF($A40=1,$H40*($G$40<=$E40)*($G$41>=$F40),$H40*($G$40<=$F40)*($G$41>=$E40))
AU40: @IF($A40=1,$H40*($G$41<=$E40)*($G$42>=$F40),$H40*($G$41<=$F40)*($G$42>=$E40))
```

```
AV40: @IF($A40=1,$H40*($G$42<=$E40)*($G$43>=$F40),$H40*($G$42<=$F40)*($G$43>=$E40))
AW40: @IF($A40=1,$H40*($G$43<=$E40)*($G$44>=$F40),$H40*($G$43<=$F40)*($G$44>=$E40))
AX40: @IF($A40=1,$H40*($G$44<=$E40)*($G$45>=$F40),$H40*($G$44<=$F40)*($G$45>=$E40))
AY40: @IF($A40=1,$H40*($G$45<=$E40)*($G$46>=$F40),$H40*($G$45<=$F40)*($G$46>=$E40))
AZ40: @IF($A40=1,$H40*($G$46<=$E40)*($G$47>=$F40),$H40*($G$46<=$F40)*($G$47>=$E40))
BA40: @IF($A40=1,$H40*($G$47<=$E40)*($G$48>=$F40),$H40*($G$47<=$F40)*($G$48>=$E40))
BB40: @IF($A40=1,$H40*($G$48<=$E40)*($G$49>=$F40),$H40*($G$48<=$F40)*($G$49>=$E40))
BC40: @IF($A40=1,$H40*($G$49<=$E40)*($G$50>=$F40),$H40*($G$49<=$F40)*($G$50>=$E40))
BD40: @IF($A40=1,$H40*($G$50<=$E40)*($G$51>=$F40),$H40*($G$50<=$F40)*($G$51>=$E40))
BE40: @IF($A40=1,$H40*($G$51<=$E40)*($G$52>=$F40),$H40*($G$51<=$F40)*($G$52>=$E40))
BF40: @IF($A40=1,$H40*($G$52<=$E40)*($G$53>=$F40),$H40*($G$52<=$F40)*($G$53>=$E40))
BG40: @IF($A40=1,$H40*($G$53<=$E40)*($G$54>=$F40),$H40*($G$53<=$F40)*($G$54>=$E40))
BH40: @IF($A40=1,$H40*($G$54<=$E40)*($G$55>=$F40),$H40*($G$54<=$F40)*($G$55>=$E40))
BI40: @IF($A40=1,$H40*($G$55<=$E40)*($G$56>=$F40),$H40*($G$55<=$F40)*($G$56>=$E40))
BJ40: @IF($A40=1,$H40*($G$56<=$E40)*($G$57>=$F40),$H40*($G$56<=$F40)*($G$57>=$E40))
BK40: @IF($A40=1,$H40*($G$57<=$E40)*($G$58>=$F40),$H40*($G$57<=$F40)*($G$58>=$E40))
BL40: @IF($A40=1,$H40*($G$58<=$E40)*($G$59>=$F40),$H40*($G$58<=$F40)*($G$59>=$E40))
BM40: @IF($A40=1,$H40*($G$59<=$E40)*($G$60>=$F40),$H40*($G$59<=$F40)*($G$60>=$E40))
BN40: @IF($A40=1,$H40*($G$60<=$E40)*($G$61>=$F40),$H40*($G$60<=$F40)*($G$61>=$E40))
BO40: @IF($A40=1,$H40*($G$61<=$E40)*($G$62>=$F40),$H40*($G$61<=$F40)*($G$62>=$E40))
BP40: @IF($A40=1,$H40*($G$62<=$E40)*($G$63>=$F40),$H40*($G$62<=$F40)*($G$63>=$E40))
BQ40: @IF($A40=1,$H40*($G$63<=$E40)*($G$64>=$F40),$H40*($G$63<=$F40)*($G$64>=$E40))
BR40: @IF($A40=1,$H40*($G$64<=$E40)*($G$65>=$F40),$H40*($G$64<=$F40)*($G$65>=$E40))
BS40: @IF($A40=1,$H40*($G$65<=$E40)*($G$66>=$F40),$H40*($G$65<=$F40)*($G$66>=$E40))
BT40: @IF($A40=1,$H40*($G$66<=$E40)*($G$67>=$F40),$H40*($G$66<=$F40)*($G$67>=$E40))
BU40: @IF($A40=1,$H40*($G$67<=$E40)*($G$68>=$F40),$H40*($G$67<=$F40)*($G$68>=$E40))
BV40: @IF($A40=1,$H40*($G$68<=$E40)*($G$69>=$F40),$H40*($G$68<=$F40)*($G$69>=$E40))
BW40: @IF($A40=1,$H40*($G$69<=$E40)*($G$70>=$F40),$H40*($G$69<=$F40)*($G$70>=$E40))
BX40: @IF($A40=1,$H40*($G$70<=$E40)*($G$71>=$F40),$H40*($G$70<=$F40)*($G$71>=$E40))
BY40: @IF($A40=1,$H40*($G$71<=$E40)*($G$72>=$F40),$H40*($G$71<=$F40)*($G$72>=$E40))
BZ40: @IF($A40=1,$H40*($G$72<=$E40)*($G$73>=$F40),$H40*($G$72<=$F40)*($G$73>=$E40))
P41: @IF($A41=1,$H41*($G$10<=$E41)*($G$11>=$F41),$H41*($G$10<=$F41)*($G$11>=$E41))
Q41: @IF($A41=1,$H41*($G$11<=$E41)*($G$12>=$F41),$H41*($G$11<=$F41)*($G$12>=$E41))
R41: @IF($A41=1,$H41*($G$12<=$E41)*($G$13>=$F41),$H41*($G$12<=$F41)*($G$13>=$E41))
S41: @IF($A41=1,$H41*($G$13<=$E41)*($G$14>=$F41),$H41*($G$13<=$F41)*($G$14>=$E41))
T41: @IF($A41=1,$H41*($G$14<=$E41)*($G$15>=$F41),$H41*($G$14<=$F41)*($G$15>=$E41))
U41: @IF($A41=1,$H41*($G$15<=$E41)*($G$16>=$F41),$H41*($G$15<=$F41)*($G$16>=$E41))
V41: @IF($A41=1,$H41*($G$16<=$E41)*($G$17>=$F41),$H41*($G$16<=$F41)*($G$17>=$E41))
W41: @IF($A41=1,$H41*($G$17<=$E41)*($G$18>=$F41),$H41*($G$17<=$F41)*($G$18>=$E41))
X41: @IF($A41=1,$H41*($G$18<=$E41)*($G$19>=$F41),$H41*($G$18<=$F41)*($G$19>=$E41))
Y41: @IF($A41=1,$H41*($G$19<=$E41)*($G$20>=$F41),$H41*($G$19<=$F41)*($G$20>=$E41))
Z41: @IF($A41=1,$H41*($G$20<=$E41)*($G$21>=$F41),$H41*($G$20<=$F41)*($G$21>=$E41))
AA41: @IF($A41=1,$H41*($G$21<=$E41)*($G$22>=$F41),$H41*($G$21<=$F41)*($G$22>=$E41))
AB41: @IF($A41=1,$H41*($G$22<=$E41)*($G$23>=$F41),$H41*($G$22<=$F41)*($G$23>=$E41))
AC41: @IF($A41=1,$H41*($G$23<=$E41)*($G$24>=$F41),$H41*($G$23<=$F41)*($G$24>=$E41))
AD41: @IF($A41=1,$H41*($G$24<=$E41)*($G$25>=$F41),$H41*($G$24<=$F41)*($G$25>=$E41))
AE41: @IF($A41=1,$H41*($G$25<=$E41)*($G$26>=$F41),$H41*($G$25<=$F41)*($G$26>=$E41))
AF41: @IF($A41=1,$H41*($G$26<=$E41)*($G$27>=$F41),$H41*($G$26<=$F41)*($G$27>=$E41))
AG41: @IF($A41=1,$H41*($G$27<=$E41)*($G$28>=$F41),$H41*($G$27<=$F41)*($G$28>=$E41))
AH41: @IF($A41=1,$H41*($G$28<=$E41)*($G$29>=$F41),$H41*($G$28<=$F41)*($G$29>=$E41))
AI41: @IF($A41=1,$H41*($G$29<=$E41)*($G$30>=$F41),$H41*($G$29<=$F41)*($G$30>=$E41))
AJ41: @IF($A41=1,$H41*($G$30<=$E41)*($G$31>=$F41),$H41*($G$30<=$F41)*($G$31>=$E41))
AK41: @IF($A41=1,$H41*($G$31<=$E41)*($G$32>=$F41),$H41*($G$31<=$F41)*($G$32>=$E41))
AL41: @IF($A41=1,$H41*($G$32<=$E41)*($G$33>=$F41),$H41*($G$32<=$F41)*($G$33>=$E41))
AM41: @IF($A41=1,$H41*($G$33<=$E41)*($G$34>=$F41),$H41*($G$33<=$F41)*($G$34>=$E41))
AN41: @IF($A41=1,$H41*($G$34<=$E41)*($G$35>=$F41),$H41*($G$34<=$F41)*($G$35>=$E41))
```

```
AO41: @IF($A41=1,$H41*($G$35<=$E41)*($G$36>=$F41),$H41*($G$35<=$F41)*($G$36>=$E41))
AP41: @IF($A41=1,$H41*($G$36<=$E41)*($G$37>=$F41),$H41*($G$36<=$F41)*($G$37>=$E41))
AQ41: @IF($A41=1,$H41*($G$37<=$E41)*($G$38>=$F41),$H41*($G$37<=$F41)*($G$38>=$E41))
AR41: @IF($A41=1,$H41*($G$38<=$E41)*($G$39>=$F41),$H41*($G$38<=$F41)*($G$39>=$E41))
AS41: @IF($A41=1,$H41*($G$39<=$E41)*($G$40>=$F41),$H41*($G$39<=$F41)*($G$40>=$E41))
AT41: @IF($A41=1,$H41*($G$40<=$E41)*($G$41>=$F41),$H41*($G$40<=$F41)*($G$41>=$E41))
AU41: @IF($A41=1,$H41*($G$41<=$E41)*($G$42>=$F41),$H41*($G$41<=$F41)*($G$42>=$E41))
AV41: @IF($A41=1,$H41*($G$42<=$E41)*($G$43>=$F41),$H41*($G$42<=$F41)*($G$43>=$E41))
AW41: @IF($A41=1,$H41*($G$43<=$E41)*($G$44>=$F41),$H41*($G$43<=$F41)*($G$44>=$E41))
AX41: @IF($A41=1,$H41*($G$44<=$E41)*($G$45>=$F41),$H41*($G$44<=$F41)*($G$45>=$E41))
AY41: @IF($A41=1,$H41*($G$45<=$E41)*($G$46>=$F41),$H41*($G$45<=$F41)*($G$46>=$E41))
AZ41: @IF($A41=1,$H41*($G$46<=$E41)*($G$47>=$F41),$H41*($G$46<=$F41)*($G$47>=$E41))
BA41: @IF($A41=1,$H41*($G$47<=$E41)*($G$48>=$F41),$H41*($G$47<=$F41)*($G$48>=$E41))
BB41: @IF($A41=1,$H41*($G$48<=$E41)*($G$49>=$F41),$H41*($G$48<=$F41)*($G$49>=$E41))
BC41: @IF($A41=1,$H41*($G$49<=$E41)*($G$50>=$F41),$H41*($G$49<=$F41)*($G$50>=$E41))
BD41: @IF($A41=1,$H41*($G$50<=$E41)*($G$51>=$F41),$H41*($G$50<=$F41)*($G$51>=$E41))
BE41: @IF($A41=1,$H41*($G$51<=$E41)*($G$52>=$F41),$H41*($G$51<=$F41)*($G$52>=$E41))
BF41: @IF($A41=1,$H41*($G$52<=$E41)*($G$53>=$F41),$H41*($G$52<=$F41)*($G$53>=$E41))
BG41: @IF($A41=1,$H41*($G$53<=$E41)*($G$54>=$F41),$H41*($G$53<=$F41)*($G$54>=$E41))
BH41: @IF($A41=1,$H41*($G$54<=$E41)*($G$55>=$F41),$H41*($G$54<=$F41)*($G$55>=$E41))
BI41: @IF($A41=1,$H41*($G$55<=$E41)*($G$56>=$F41),$H41*($G$55<=$F41)*($G$56>=$E41))
BJ41: @IF($A41=1,$H41*($G$56<=$E41)*($G$57>=$F41),$H41*($G$56<=$F41)*($G$57>=$E41))
BK41: @IF($A41=1,$H41*($G$57<=$E41)*($G$58>=$F41),$H41*($G$57<=$F41)*($G$58>=$E41))
BL41: @IF($A41=1,$H41*($G$58<=$E41)*($G$59>=$F41),$H41*($G$58<=$F41)*($G$59>=$E41))
BM41: @IF($A41=1,$H41*($G$59<=$E41)*($G$60>=$F41),$H41*($G$59<=$F41)*($G$60>=$E41))
BN41: @IF($A41=1,$H41*($G$60<=$E41)*($G$61>=$F41),$H41*($G$60<=$F41)*($G$61>=$E41))
BO41: @IF($A41=1,$H41*($G$61<=$E41)*($G$62>=$F41),$H41*($G$61<=$F41)*($G$62>=$E41))
BP41: @IF($A41=1,$H41*($G$62<=$E41)*($G$63>=$F41),$H41*($G$62<=$F41)*($G$63>=$E41))
BQ41: @IF($A41=1,$H41*($G$63<=$E41)*($G$64>=$F41),$H41*($G$63<=$F41)*($G$64>=$E41))
BR41: @IF($A41=1,$H41*($G$64<=$E41)*($G$65>=$F41),$H41*($G$64<=$F41)*($G$65>=$E41))
BS41: @IF($A41=1,$H41*($G$65<=$E41)*($G$66>=$F41),$H41*($G$65<=$F41)*($G$66>=$E41))
BT41: @IF($A41=1,$H41*($G$66<=$E41)*($G$67>=$F41),$H41*($G$66<=$F41)*($G$67>=$E41))
BU41: @IF($A41=1,$H41*($G$67<=$E41)*($G$68>=$F41),$H41*($G$67<=$F41)*($G$68>=$E41))
BV41: @IF($A41=1,$H41*($G$68<=$E41)*($G$69>=$F41),$H41*($G$68<=$F41)*($G$69>=$E41))
BW41: @IF($A41=1,$H41*($G$69<=$E41)*($G$70>=$F41),$H41*($G$69<=$F41)*($G$70>=$E41))
BX41: @IF($A41=1,$H41*($G$70<=$E41)*($G$71>=$F41),$H41*($G$70<=$F41)*($G$71>=$E41))
BY41: @IF($A41=1,$H41*($G$71<=$E41)*($G$72>=$F41),$H41*($G$71<=$F41)*($G$72>=$E41))
BZ41: @IF($A41=1,$H41*($G$72<=$E41)*($G$73>=$F41),$H41*($G$72<=$F41)*($G$73>=$E41))
P42: @IF($A42=1,$H42*($G$10<=$E42)*($G$11>=$F42),$H42*($G$10<=$F42)*($G$11>=$E42))
Q42: @IF($A42=1,$H42*($G$11<=$E42)*($G$12>=$F42),$H42*($G$11<=$F42)*($G$12>=$E42))
R42: @IF($A42=1,$H42*($G$12<=$E42)*($G$13>=$F42),$H42*($G$12<=$F42)*($G$13>=$E42))
S42: @IF($A42=1,$H42*($G$13<=$E42)*($G$14>=$F42),$H42*($G$13<=$F42)*($G$14>=$E42))
T42: @IF($A42=1,$H42*($G$14<=$E42)*($G$15>=$F42),$H42*($G$14<=$F42)*($G$15>=$E42))
U42: @IF($A42=1,$H42*($G$15<=$E42)*($G$16>=$F42),$H42*($G$15<=$F42)*($G$16>=$E42))
V42: @IF($A42=1,$H42*($G$16<=$E42)*($G$17>=$F42),$H42*($G$16<=$F42)*($G$17>=$E42))
W42: @IF($A42=1,$H42*($G$17<=$E42)*($G$18>=$F42),$H42*($G$17<=$F42)*($G$18>=$E42))
X42: @IF($A42=1,$H42*($G$18<=$E42)*($G$19>=$F42),$H42*($G$18<=$F42)*($G$19>=$E42))
Y42: @IF($A42=1,$H42*($G$19<=$E42)*($G$20>=$F42),$H42*($G$19<=$F42)*($G$20>=$E42))
Z42: @IF($A42=1,$H42*($G$20<=$E42)*($G$21>=$F42),$H42*($G$20<=$F42)*($G$21>=$E42))
AA42: @IF($A42=1,$H42*($G$21<=$E42)*($G$22>=$F42),$H42*($G$21<=$F42)*($G$22>=$E42))
AB42: @IF($A42=1,$H42*($G$22<=$E42)*($G$23>=$F42),$H42*($G$22<=$F42)*($G$23>=$E42))
AC42: @IF($A42=1,$H42*($G$23<=$E42)*($G$24>=$F42),$H42*($G$23<=$F42)*($G$24>=$E42))
AD42: @IF($A42=1,$H42*($G$24<=$E42)*($G$25>=$F42),$H42*($G$24<=$F42)*($G$25>=$E42))
AE42: @IF($A42=1,$H42*($G$25<=$E42)*($G$26>=$F42),$H42*($G$25<=$F42)*($G$26>=$E42))
AF42: @IF($A42=1,$H42*($G$26<=$E42)*($G$27>=$F42),$H42*($G$26<=$F42)*($G$27>=$E42))
AG42: @IF($A42=1,$H42*($G$27<=$E42)*($G$28>=$F42),$H42*($G$27<=$F42)*($G$28>=$E42))
```

```
AH42: @IF($A42=1,$H42*($G$28<=$E42)*($G$29>=$F42),$H42*($G$28<=$F42)*($G$29>=$E42))
AI42: @IF($A42=1,$H42*($G$29<=$E42)*($G$30>=$F42),$H42*($G$29<=$F42)*($G$30>=$E42))
AJ42: @IF($A42=1,$H42*($G$30<=$E42)*($G$31>=$F42),$H42*($G$30<=$F42)*($G$31>=$E42))
AK42: @IF($A42=1,$H42*($G$31<=$E42)*($G$32>=$F42),$H42*($G$31<=$F42)*($G$32>=$E42))
AL42: @IF($A42=1,$H42*($G$32<=$E42)*($G$33>=$F42),$H42*($G$32<=$F42)*($G$33>=$E42))
AM42: @IF($A42=1,$H42*($G$33<=$E42)*($G$34>=$F42),$H42*($G$33<=$F42)*($G$34>=$E42))
AN42: @IF($A42=1,$H42*($G$34<=$E42)*($G$35>=$F42),$H42*($G$34<=$F42)*($G$35>=$E42))
AO42: @IF($A42=1,$H42*($G$35<=$E42)*($G$36>=$F42),$H42*($G$35<=$F42)*($G$36>=$E42))
AP42: @IF($A42=1,$H42*($G$36<=$E42)*($G$37>=$F42),$H42*($G$36<=$F42)*($G$37>=$E42))
AQ42: @IF($A42=1,$H42*($G$37<=$E42)*($G$38>=$F42),$H42*($G$37<=$F42)*($G$38>=$E42))
AR42: @IF($A42=1,$H42*($G$38<=$E42)*($G$39>=$F42),$H42*($G$38<=$F42)*($G$39>=$E42))
AS42: @IF($A42=1,$H42*($G$39<=$E42)*($G$40>=$F42),$H42*($G$39<=$F42)*($G$40>=$E42))
AT42: @IF($A42=1,$H42*($G$40<=$E42)*($G$41>=$F42),$H42*($G$40<=$F42)*($G$41>=$E42))
AU42: @IF($A42=1,$H42*($G$41<=$E42)*($G$42>=$F42),$H42*($G$41<=$F42)*($G$42>=$E42))
AV42: @IF($A42=1,$H42*($G$42<=$E42)*($G$43>=$F42),$H42*($G$42<=$F42)*($G$43>=$E42))
AW42: @IF($A42=1,$H42*($G$43<=$E42)*($G$44>=$F42),$H42*($G$43<=$F42)*($G$44>=$E42))
AX42: @IF($A42=1,$H42*($G$44<=$E42)*($G$45>=$F42),$H42*($G$44<=$F42)*($G$45>=$E42))
AY42: @IF($A42=1,$H42*($G$45<=$E42)*($G$46>=$F42),$H42*($G$45<=$F42)*($G$46>=$E42))
AZ42: @IF($A42=1,$H42*($G$46<=$E42)*($G$47>=$F42),$H42*($G$46<=$F42)*($G$47>=$E42))
BA42: @IF($A42=1,$H42*($G$47<=$E42)*($G$48>=$F42),$H42*($G$47<=$F42)*($G$48>=$E42))
BB42: @IF($A42=1,$H42*($G$48<=$E42)*($G$49>=$F42),$H42*($G$48<=$F42)*($G$49>=$E42))
BC42: @IF($A42=1,$H42*($G$49<=$E42)*($G$50>=$F42),$H42*($G$49<=$F42)*($G$50>=$E42))
BD42: @IF($A42=1,$H42*($G$50<=$E42)*($G$51>=$F42),$H42*($G$50<=$F42)*($G$51>=$E42))
BE42: @IF($A42=1,$H42*($G$51<=$E42)*($G$52>=$F42),$H42*($G$51<=$F42)*($G$52>=$E42))
BF42: @IF($A42=1,$H42*($G$52<=$E42)*($G$53>=$F42),$H42*($G$52<=$F42)*($G$53>=$E42))
BG42: @IF($A42=1,$H42*($G$53<=$E42)*($G$54>=$F42),$H42*($G$53<=$F42)*($G$54>=$E42))
BH42: @IF($A42=1,$H42*($G$54<=$E42)*($G$55>=$F42),$H42*($G$54<=$F42)*($G$55>=$E42))
BI42: @IF($A42=1,$H42*($G$55<=$E42)*($G$56>=$F42),$H42*($G$55<=$F42)*($G$56>=$E42))
BJ42: @IF($A42=1,$H42*($G$56<=$E42)*($G$57>=$F42),$H42*($G$56<=$F42)*($G$57>=$E42))
BK42: @IF($A42=1,$H42*($G$57<=$E42)*($G$58>=$F42),$H42*($G$57<=$F42)*($G$58>=$E42))
BL42: @IF($A42=1,$H42*($G$58<=$E42)*($G$59>=$F42),$H42*($G$58<=$F42)*($G$59>=$E42))
BM42: @IF($A42=1,$H42*($G$59<=$E42)*($G$60>=$F42),$H42*($G$59<=$F42)*($G$60>=$E42))
BN42: @IF($A42=1,$H42*($G$60<=$E42)*($G$61>=$F42),$H42*($G$60<=$F42)*($G$61>=$E42))
BO42: @IF($A42=1,$H42*($G$61<=$E42)*($G$62>=$F42),$H42*($G$61<=$F42)*($G$62>=$E42))
BP42: @IF($A42=1,$H42*($G$62<=$E42)*($G$63>=$F42),$H42*($G$62<=$F42)*($G$63>=$E42))
BQ42: @IF($A42=1,$H42*($G$63<=$E42)*($G$64>=$F42),$H42*($G$63<=$F42)*($G$64>=$E42))
BR42: @IF($A42=1,$H42*($G$64<=$E42)*($G$65>=$F42),$H42*($G$64<=$F42)*($G$65>=$E42))
BS42: @IF($A42=1,$H42*($G$65<=$E42)*($G$66>=$F42),$H42*($G$65<=$F42)*($G$66>=$E42))
BT42: @IF($A42=1,$H42*($G$66<=$E42)*($G$67>=$F42),$H42*($G$66<=$F42)*($G$67>=$E42))
BU42: @IF($A42=1,$H42*($G$67<=$E42)*($G$68>=$F42),$H42*($G$67<=$F42)*($G$68>=$E42))
BV42: @IF($A42=1,$H42*($G$68<=$E42)*($G$69>=$F42),$H42*($G$68<=$F42)*($G$69>=$E42))
BW42: @IF($A42=1,$H42*($G$69<=$E42)*($G$70>=$F42),$H42*($G$69<=$F42)*($G$70>=$E42))
BX42: @IF($A42=1,$H42*($G$70<=$E42)*($G$71>=$F42),$H42*($G$70<=$F42)*($G$71>=$E42))
BY42: @IF($A42=1,$H42*($G$71<=$E42)*($G$72>=$F42),$H42*($G$71<=$F42)*($G$72>=$E42))
BZ42: @IF($A42=1,$H42*($G$72<=$E42)*($G$73>=$F42),$H42*($G$72<=$F42)*($G$73>=$E42))
P43: @IF($A43=1,$H43*($G$10<=$E43)*($G$11>=$F43),$H43*($G$10<=$F43)*($G$11>=$E43))
Q43: @IF($A43=1,$H43*($G$11<=$E43)*($G$12>=$F43),$H43*($G$11<=$F43)*($G$12>=$E43))
R43: @IF($A43=1,$H43*($G$12<=$E43)*($G$13>=$F43),$H43*($G$12<=$F43)*($G$13>=$E43))
S43: @IF($A43=1,$H43*($G$13<=$E43)*($G$14>=$F43),$H43*($G$13<=$F43)*($G$14>=$E43))
T43: @IF($A43=1,$H43*($G$14<=$E43)*($G$15>=$F43),$H43*($G$14<=$F43)*($G$15>=$E43))
U43: @IF($A43=1,$H43*($G$15<=$E43)*($G$16>=$F43),$H43*($G$15<=$F43)*($G$16>=$E43))
V43: @IF($A43=1,$H43*($G$16<=$E43)*($G$17>=$F43),$H43*($G$16<=$F43)*($G$17>=$E43))
W43: @IF($A43=1,$H43*($G$17<=$E43)*($G$18>=$F43),$H43*($G$17<=$F43)*($G$18>=$E43))
X43: @IF($A43=1,$H43*($G$18<=$E43)*($G$19>=$F43),$H43*($G$18<=$F43)*($G$19>=$E43))
Y43: @IF($A43=1,$H43*($G$19<=$E43)*($G$20>=$F43),$H43*($G$19<=$F43)*($G$20>=$E43))
Z43: @IF($A43=1,$H43*($G$20<=$E43)*($G$21>=$F43),$H43*($G$20<=$F43)*($G$21>=$E43))
```

```
AA43: @IF($A43=1,$H43*($G$21<=$E43)*($G$22>=$F43),$H43*($G$21<=$F43)*($G$22>=$E43))
AB43: @IF($A43=1,$H43*($G$22<=$E43)*($G$23>=$F43),$H43*($G$22<=$F43)*($G$23>=$E43))
AC43: @IF($A43=1,$H43*($G$23<=$E43)*($G$24>=$F43),$H43*($G$23<=$F43)*($G$24>=$E43))
AD43: @IF($A43=1,$H43*($G$24<=$E43)*($G$25>=$F43),$H43*($G$24<=$F43)*($G$25>=$E43))
AE43: @IF($A43=1,$H43*($G$25<=$E43)*($G$26>=$F43),$H43*($G$25<=$F43)*($G$26>=$E43))
AF43: @IF($A43=1,$H43*($G$26<=$E43)*($G$27>=$F43),$H43*($G$26<=$F43)*($G$27>=$E43))
AG43: @IF($A43=1,$H43*($G$27<=$E43)*($G$28>=$F43),$H43*($G$27<=$F43)*($G$28>=$E43))
AH43: @IF($A43=1,$H43*($G$28<=$E43)*($G$29>=$F43),$H43*($G$28<=$F43)*($G$29>=$E43))
AI43: @IF($A43=1,$H43*($G$29<=$E43)*($G$30>=$F43),$H43*($G$29<=$F43)*($G$30>=$E43))
AJ43: @IF($A43=1,$H43*($G$30<=$E43)*($G$31>=$F43),$H43*($G$30<=$F43)*($G$31>=$E43))
AK43: @IF($A43=1,$H43*($G$31<=$E43)*($G$32>=$F43),$H43*($G$31<=$F43)*($G$32>=$E43))
AL43: @IF($A43=1,$H43*($G$32<=$E43)*($G$33>=$F43),$H43*($G$32<=$F43)*($G$33>=$E43))
AM43: @IF($A43=1,$H43*($G$33<=$E43)*($G$34>=$F43),$H43*($G$33<=$F43)*($G$34>=$E43))
AN43: @IF($A43=1,$H43*($G$34<=$E43)*($G$35>=$F43),$H43*($G$34<=$F43)*($G$35>=$E43))
AO43: @IF($A43=1,$H43*($G$35<=$E43)*($G$36>=$F43),$H43*($G$35<=$F43)*($G$36>=$E43))
AP43: @IF($A43=1,$H43*($G$36<=$E43)*($G$37>=$F43),$H43*($G$36<=$F43)*($G$37>=$E43))
AQ43: @IF($A43=1,$H43*($G$37<=$E43)*($G$38>=$F43),$H43*($G$37<=$F43)*($G$38>=$E43))
AR43: @IF($A43=1,$H43*($G$38<=$E43)*($G$39>=$F43),$H43*($G$38<=$F43)*($G$39>=$E43))
AS43: @IF($A43=1,$H43*($G$39<=$E43)*($G$40>=$F43),$H43*($G$39<=$F43)*($G$40>=$E43))
AT43: @IF($A43=1,$H43*($G$40<=$E43)*($G$41>=$F43),$H43*($G$40<=$F43)*($G$41>=$E43))
AU43: @IF($A43=1,$H43*($G$41<=$E43)*($G$42>=$F43),$H43*($G$41<=$F43)*($G$42>=$E43))
AV43: @IF($A43=1,$H43*($G$42<=$E43)*($G$43>=$F43),$H43*($G$42<=$F43)*($G$43>=$E43))
AW43: @IF($A43=1,$H43*($G$43<=$E43)*($G$44>=$F43),$H43*($G$43<=$F43)*($G$44>=$E43))
AX43: @IF($A43=1,$H43*($G$44<=$E43)*($G$45>=$F43),$H43*($G$44<=$F43)*($G$45>=$E43))
AY43: @IF($A43=1,$H43*($G$45<=$E43)*($G$46>=$F43),$H43*($G$45<=$F43)*($G$46>=$E43))
AZ43: @IF($A43=1,$H43*($G$46<=$E43)*($G$47>=$F43),$H43*($G$46<=$F43)*($G$47>=$E43))
BA43: @IF($A43=1,$H43*($G$47<=$E43)*($G$48>=$F43),$H43*($G$47<=$F43)*($G$48>=$E43))
BB43: @IF($A43=1,$H43*($G$48<=$E43)*($G$49>=$F43),$H43*($G$48<=$F43)*($G$49>=$E43))
BC43: @IF($A43=1,$H43*($G$49<=$E43)*($G$50>=$F43),$H43*($G$49<=$F43)*($G$50>=$E43))
BD43: @IF($A43=1,$H43*($G$50<=$E43)*($G$51>=$F43),$H43*($G$50<=$F43)*($G$51>=$E43))
BE43: @IF($A43=1,$H43*($G$51<=$E43)*($G$52>=$F43),$H43*($G$51<=$F43)*($G$52>=$E43))
BF43: @IF($A43=1,$H43*($G$52<=$E43)*($G$53>=$F43),$H43*($G$52<=$F43)*($G$53>=$E43))
BG43: @IF($A43=1,$H43*($G$53<=$E43)*($G$54>=$F43),$H43*($G$53<=$F43)*($G$54>=$E43))
BH43: @IF($A43=1,$H43*($G$54<=$E43)*($G$55>=$F43),$H43*($G$54<=$F43)*($G$55>=$E43))
BI43: @IF($A43=1,$H43*($G$55<=$E43)*($G$56>=$F43),$H43*($G$55<=$F43)*($G$56>=$E43))
BJ43: @IF($A43=1,$H43*($G$56<=$E43)*($G$57>=$F43),$H43*($G$56<=$F43)*($G$57>=$E43))
BK43: @IF($A43=1,$H43*($G$57<=$E43)*($G$58>=$F43),$H43*($G$57<=$F43)*($G$58>=$E43))
BL43: @IF($A43=1,$H43*($G$58<=$E43)*($G$59>=$F43),$H43*($G$58<=$F43)*($G$59>=$E43))
BM43: @IF($A43=1,$H43*($G$59<=$E43)*($G$60>=$F43),$H43*($G$59<=$F43)*($G$60>=$E43))
BN43: @IF($A43=1,$H43*($G$60<=$E43)*($G$61>=$F43),$H43*($G$60<=$F43)*($G$61>=$E43))
BO43: @IF($A43=1,$H43*($G$61<=$E43)*($G$62>=$F43),$H43*($G$61<=$F43)*($G$62>=$E43))
BP43: @IF($A43=1,$H43*($G$62<=$E43)*($G$63>=$F43),$H43*($G$62<=$F43)*($G$63>=$E43))
BQ43: @IF($A43=1,$H43*($G$63<=$E43)*($G$64>=$F43),$H43*($G$63<=$F43)*($G$64>=$E43))
BR43: @IF($A43=1,$H43*($G$64<=$E43)*($G$65>=$F43),$H43*($G$64<=$F43)*($G$65>=$E43))
BS43: @IF($A43=1,$H43*($G$65<=$E43)*($G$66>=$F43),$H43*($G$65<=$F43)*($G$66>=$E43))
BT43: @IF($A43=1,$H43*($G$66<=$E43)*($G$67>=$F43),$H43*($G$66<=$F43)*($G$67>=$E43))
BU43: @IF($A43=1,$H43*($G$67<=$E43)*($G$68>=$F43),$H43*($G$67<=$F43)*($G$68>=$E43))
BV43: @IF($A43=1,$H43*($G$68<=$E43)*($G$69>=$F43),$H43*($G$68<=$F43)*($G$69>=$E43))
BW43: @IF($A43=1,$H43*($G$69<=$E43)*($G$70>=$F43),$H43*($G$69<=$F43)*($G$70>=$E43))
BX43: @IF($A43=1,$H43*($G$70<=$E43)*($G$71>=$F43),$H43*($G$70<=$F43)*($G$71>=$E43))
BY43: @IF($A43=1,$H43*($G$71<=$E43)*($G$72>=$F43),$H43*($G$71<=$F43)*($G$72>=$E43))
BZ43: @IF($A43=1,$H43*($G$72<=$E43)*($G$73>=$F43),$H43*($G$72<=$F43)*($G$73>=$E43))
P44: @IF($A44=1,$H44*($G$10<=$E44)*($G$11>=$F44),$H44*($G$10<=$F44)*($G$11>=$E44))
Q44: @IF($A44=1,$H44*($G$11<=$E44)*($G$12>=$F44),$H44*($G$11<=$F44)*($G$12>=$E44))
R44: @IF($A44=1,$H44*($G$12<=$E44)*($G$13>=$F44),$H44*($G$12<=$F44)*($G$13>=$E44))
S44: @IF($A44=1,$H44*($G$13<=$E44)*($G$14>=$F44),$H44*($G$13<=$F44)*($G$14>=$E44))
```

T44: @IF($A44=1,$H44*($G$14<=$E44)*($G$15>=$F44),$H44*($G$14<=$F44)*($G$15>=$E44))
U44: @IF($A44=1,$H44*($G$15<=$E44)*($G$16>=$F44),$H44*($G$15<=$F44)*($G$16>=$E44))
V44: @IF($A44=1,$H44*($G$16<=$E44)*($G$17>=$F44),$H44*($G$16<=$F44)*($G$17>=$E44))
W44: @IF($A44=1,$H44*($G$17<=$E44)*($G$18>=$F44),$H44*($G$17<=$F44)*($G$18>=$E44))
X44: @IF($A44=1,$H44*($G$18<=$E44)*($G$19>=$F44),$H44*($G$18<=$F44)*($G$19>=$E44))
Y44: @IF($A44=1,$H44*($G$19<=$E44)*($G$20>=$F44),$H44*($G$19<=$F44)*($G$20>=$E44))
Z44: @IF($A44=1,$H44*($G$20<=$E44)*($G$21>=$F44),$H44*($G$20<=$F44)*($G$21>=$E44))
AA44: @IF($A44=1,$H44*($G$21<=$E44)*($G$22>=$F44),$H44*($G$21<=$F44)*($G$22>=$E44))
AB44: @IF($A44=1,$H44*($G$22<=$E44)*($G$23>=$F44),$H44*($G$22<=$F44)*($G$23>=$E44))
AC44: @IF($A44=1,$H44*($G$23<=$E44)*($G$24>=$F44),$H44*($G$23<=$F44)*($G$24>=$E44))
AD44: @IF($A44=1,$H44*($G$24<=$E44)*($G$25>=$F44),$H44*($G$24<=$F44)*($G$25>=$E44))
AE44: @IF($A44=1,$H44*($G$25<=$E44)*($G$26>=$F44),$H44*($G$25<=$F44)*($G$26>=$E44))
AF44: @IF($A44=1,$H44*($G$26<=$E44)*($G$27>=$F44),$H44*($G$26<=$F44)*($G$27>=$E44))
AG44: @IF($A44=1,$H44*($G$27<=$E44)*($G$28>=$F44),$H44*($G$27<=$F44)*($G$28>=$E44))
AH44: @IF($A44=1,$H44*($G$28<=$E44)*($G$29>=$F44),$H44*($G$28<=$F44)*($G$29>=$E44))
AI44: @IF($A44=1,$H44*($G$29<=$E44)*($G$30>=$F44),$H44*($G$29<=$F44)*($G$30>=$E44))
AJ44: @IF($A44=1,$H44*($G$30<=$E44)*($G$31>=$F44),$H44*($G$30<=$F44)*($G$31>=$E44))
AK44: @IF($A44=1,$H44*($G$31<=$E44)*($G$32>=$F44),$H44*($G$31<=$F44)*($G$32>=$E44))
AL44: @IF($A44=1,$H44*($G$32<=$E44)*($G$33>=$F44),$H44*($G$32<=$F44)*($G$33>=$E44))
AM44: @IF($A44=1,$H44*($G$33<=$E44)*($G$34>=$F44),$H44*($G$33<=$F44)*($G$34>=$E44))
AN44: @IF($A44=1,$H44*($G$34<=$E44)*($G$35>=$F44),$H44*($G$34<=$F44)*($G$35>=$E44))
AO44: @IF($A44=1,$H44*($G$35<=$E44)*($G$36>=$F44),$H44*($G$35<=$F44)*($G$36>=$E44))
AP44: @IF($A44=1,$H44*($G$36<=$E44)*($G$37>=$F44),$H44*($G$36<=$F44)*($G$37>=$E44))
AQ44: @IF($A44=1,$H44*($G$37<=$E44)*($G$38>=$F44),$H44*($G$37<=$F44)*($G$38>=$E44))
AR44: @IF($A44=1,$H44*($G$38<=$E44)*($G$39>=$F44),$H44*($G$38<=$F44)*($G$39>=$E44))
AS44: @IF($A44=1,$H44*($G$39<=$E44)*($G$40>=$F44),$H44*($G$39<=$F44)*($G$40>=$E44))
AT44: @IF($A44=1,$H44*($G$40<=$E44)*($G$41>=$F44),$H44*($G$40<=$F44)*($G$41>=$E44))
AU44: @IF($A44=1,$H44*($G$41<=$E44)*($G$42>=$F44),$H44*($G$41<=$F44)*($G$42>=$E44))
AV44: @IF($A44=1,$H44*($G$42<=$E44)*($G$43>=$F44),$H44*($G$42<=$F44)*($G$43>=$E44))
AW44: @IF($A44=1,$H44*($G$43<=$E44)*($G$44>=$F44),$H44*($G$43<=$F44)*($G$44>=$E44))
AX44: @IF($A44=1,$H44*($G$44<=$E44)*($G$45>=$F44),$H44*($G$44<=$F44)*($G$45>=$E44))
AY44: @IF($A44=1,$H44*($G$45<=$E44)*($G$46>=$F44),$H44*($G$45<=$F44)*($G$46>=$E44))
AZ44: @IF($A44=1,$H44*($G$46<=$E44)*($G$47>=$F44),$H44*($G$46<=$F44)*($G$47>=$E44))
BA44: @IF($A44=1,$H44*($G$47<=$E44)*($G$48>=$F44),$H44*($G$47<=$F44)*($G$48>=$E44))
BB44: @IF($A44=1,$H44*($G$48<=$E44)*($G$49>=$F44),$H44*($G$48<=$F44)*($G$49>=$E44))
BC44: @IF($A44=1,$H44*($G$49<=$E44)*($G$50>=$F44),$H44*($G$49<=$F44)*($G$50>=$E44))
BD44: @IF($A44=1,$H44*($G$50<=$E44)*($G$51>=$F44),$H44*($G$50<=$F44)*($G$51>=$E44))
BE44: @IF($A44=1,$H44*($G$51<=$E44)*($G$52>=$F44),$H44*($G$51<=$F44)*($G$52>=$E44))
BF44: @IF($A44=1,$H44*($G$52<=$E44)*($G$53>=$F44),$H44*($G$52<=$F44)*($G$53>=$E44))
BG44: @IF($A44=1,$H44*($G$53<=$E44)*($G$54>=$F44),$H44*($G$53<=$F44)*($G$54>=$E44))
BH44: @IF($A44=1,$H44*($G$54<=$E44)*($G$55>=$F44),$H44*($G$54<=$F44)*($G$55>=$E44))
BI44: @IF($A44=1,$H44*($G$55<=$E44)*($G$56>=$F44),$H44*($G$55<=$F44)*($G$56>=$E44))
BJ44: @IF($A44=1,$H44*($G$56<=$E44)*($G$57>=$F44),$H44*($G$56<=$F44)*($G$57>=$E44))
BK44: @IF($A44=1,$H44*($G$57<=$E44)*($G$58>=$F44),$H44*($G$57<=$F44)*($G$58>=$E44))
BL44: @IF($A44=1,$H44*($G$58<=$E44)*($G$59>=$F44),$H44*($G$58<=$F44)*($G$59>=$E44))
BM44: @IF($A44=1,$H44*($G$59<=$E44)*($G$60>=$F44),$H44*($G$59<=$F44)*($G$60>=$E44))
BN44: @IF($A44=1,$H44*($G$60<=$E44)*($G$61>=$F44),$H44*($G$60<=$F44)*($G$61>=$E44))
BO44: @IF($A44=1,$H44*($G$61<=$E44)*($G$62>=$F44),$H44*($G$61<=$F44)*($G$62>=$E44))
BP44: @IF($A44=1,$H44*($G$62<=$E44)*($G$63>=$F44),$H44*($G$62<=$F44)*($G$63>=$E44))
BQ44: @IF($A44=1,$H44*($G$63<=$E44)*($G$64>=$F44),$H44*($G$63<=$F44)*($G$64>=$E44))
BR44: @IF($A44=1,$H44*($G$64<=$E44)*($G$65>=$F44),$H44*($G$64<=$F44)*($G$65>=$E44))
BS44: @IF($A44=1,$H44*($G$65<=$E44)*($G$66>=$F44),$H44*($G$65<=$F44)*($G$66>=$E44))
BT44: @IF($A44=1,$H44*($G$66<=$E44)*($G$67>=$F44),$H44*($G$66<=$F44)*($G$67>=$E44))
BU44: @IF($A44=1,$H44*($G$67<=$E44)*($G$68>=$F44),$H44*($G$67<=$F44)*($G$68>=$E44))
BV44: @IF($A44=1,$H44*($G$68<=$E44)*($G$69>=$F44),$H44*($G$68<=$F44)*($G$69>=$E44))
BW44: @IF($A44=1,$H44*($G$69<=$E44)*($G$70>=$F44),$H44*($G$69<=$F44)*($G$70>=$E44))

```
BX44: @IF($A44=1,$H44*($G$70<=$E44)*($G$71>=$F44),$H44*($G$70<=$F44)*($G$71>=$E44))
BY44: @IF($A44=1,$H44*($G$71<=$E44)*($G$72>=$F44),$H44*($G$71<=$F44)*($G$72>=$E44))
BZ44: @IF($A44=1,$H44*($G$72<=$E44)*($G$73>=$F44),$H44*($G$72<=$F44)*($G$73>=$E44))
P45: @IF($A45=1,$H45*($G$10<=$E45)*($G$11>=$F45),$H45*($G$10<=$F45)*($G$11>=$E45))
Q45: @IF($A45=1,$H45*($G$11<=$E45)*($G$12>=$F45),$H45*($G$11<=$F45)*($G$12>=$E45))
R45: @IF($A45=1,$H45*($G$12<=$E45)*($G$13>=$F45),$H45*($G$12<=$F45)*($G$13>=$E45))
S45: @IF($A45=1,$H45*($G$13<=$E45)*($G$14>=$F45),$H45*($G$13<=$F45)*($G$14>=$E45))
T45: @IF($A45=1,$H45*($G$14<=$E45)*($G$15>=$F45),$H45*($G$14<=$F45)*($G$15>=$E45))
U45: @IF($A45=1,$H45*($G$15<=$E45)*($G$16>=$F45),$H45*($G$15<=$F45)*($G$16>=$E45))
V45: @IF($A45=1,$H45*($G$16<=$E45)*($G$17>=$F45),$H45*($G$16<=$F45)*($G$17>=$E45))
W45: @IF($A45=1,$H45*($G$17<=$E45)*($G$18>=$F45),$H45*($G$17<=$F45)*($G$18>=$E45))
X45: @IF($A45=1,$H45*($G$18<=$E45)*($G$19>=$F45),$H45*($G$18<=$F45)*($G$19>=$E45))
Y45: @IF($A45=1,$H45*($G$19<=$E45)*($G$20>=$F45),$H45*($G$19<=$F45)*($G$20>=$E45))
Z45: @IF($A45=1,$H45*($G$20<=$E45)*($G$21>=$F45),$H45*($G$20<=$F45)*($G$21>=$E45))
AA45: @IF($A45=1,$H45*($G$21<=$E45)*($G$22>=$F45),$H45*($G$21<=$F45)*($G$22>=$E45))
AB45: @IF($A45=1,$H45*($G$22<=$E45)*($G$23>=$F45),$H45*($G$22<=$F45)*($G$23>=$E45))
AC45: @IF($A45=1,$H45*($G$23<=$E45)*($G$24>=$F45),$H45*($G$23<=$F45)*($G$24>=$E45))
AD45: @IF($A45=1,$H45*($G$24<=$E45)*($G$25>=$F45),$H45*($G$24<=$F45)*($G$25>=$E45))
AE45: @IF($A45=1,$H45*($G$25<=$E45)*($G$26>=$F45),$H45*($G$25<=$F45)*($G$26>=$E45))
AF45: @IF($A45=1,$H45*($G$26<=$E45)*($G$27>=$F45),$H45*($G$26<=$F45)*($G$27>=$E45))
AG45: @IF($A45=1,$H45*($G$27<=$E45)*($G$28>=$F45),$H45*($G$27<=$F45)*($G$28>=$E45))
AH45: @IF($A45=1,$H45*($G$28<=$E45)*($G$29>=$F45),$H45*($G$28<=$F45)*($G$29>=$E45))
AI45: @IF($A45=1,$H45*($G$29<=$E45)*($G$30>=$F45),$H45*($G$29<=$F45)*($G$30>=$E45))
AJ45: @IF($A45=1,$H45*($G$30<=$E45)*($G$31>=$F45),$H45*($G$30<=$F45)*($G$31>=$E45))
AK45: @IF($A45=1,$H45*($G$31<=$E45)*($G$32>=$F45),$H45*($G$31<=$F45)*($G$32>=$E45))
AL45: @IF($A45=1,$H45*($G$32<=$E45)*($G$33>=$F45),$H45*($G$32<=$F45)*($G$33>=$E45))
AM45: @IF($A45=1,$H45*($G$33<=$E45)*($G$34>=$F45),$H45*($G$33<=$F45)*($G$34>=$E45))
AN45: @IF($A45=1,$H45*($G$34<=$E45)*($G$35>=$F45),$H45*($G$34<=$F45)*($G$35>=$E45))
AO45: @IF($A45=1,$H45*($G$35<=$E45)*($G$36>=$F45),$H45*($G$35<=$F45)*($G$36>=$E45))
AP45: @IF($A45=1,$H45*($G$36<=$E45)*($G$37>=$F45),$H45*($G$36<=$F45)*($G$37>=$E45))
AQ45: @IF($A45=1,$H45*($G$37<=$E45)*($G$38>=$F45),$H45*($G$37<=$F45)*($G$38>=$E45))
AR45: @IF($A45=1,$H45*($G$38<=$E45)*($G$39>=$F45),$H45*($G$38<=$F45)*($G$39>=$E45))
AS45: @IF($A45=1,$H45*($G$39<=$E45)*($G$40>=$F45),$H45*($G$39<=$F45)*($G$40>=$E45))
AT45: @IF($A45=1,$H45*($G$40<=$E45)*($G$41>=$F45),$H45*($G$40<=$F45)*($G$41>=$E45))
AU45: @IF($A45=1,$H45*($G$41<=$E45)*($G$42>=$F45),$H45*($G$41<=$F45)*($G$42>=$E45))
AV45: @IF($A45=1,$H45*($G$42<=$E45)*($G$43>=$F45),$H45*($G$42<=$F45)*($G$43>=$E45))
AW45: @IF($A45=1,$H45*($G$43<=$E45)*($G$44>=$F45),$H45*($G$43<=$F45)*($G$44>=$E45))
AX45: @IF($A45=1,$H45*($G$44<=$E45)*($G$45>=$F45),$H45*($G$44<=$F45)*($G$45>=$E45))
AY45: @IF($A45=1,$H45*($G$45<=$E45)*($G$46>=$F45),$H45*($G$45<=$F45)*($G$46>=$E45))
AZ45: @IF($A45=1,$H45*($G$46<=$E45)*($G$47>=$F45),$H45*($G$46<=$F45)*($G$47>=$E45))
BA45: @IF($A45=1,$H45*($G$47<=$E45)*($G$48>=$F45),$H45*($G$47<=$F45)*($G$48>=$E45))
BB45: @IF($A45=1,$H45*($G$48<=$E45)*($G$49>=$F45),$H45*($G$48<=$F45)*($G$49>=$E45))
BC45: @IF($A45=1,$H45*($G$49<=$E45)*($G$50>=$F45),$H45*($G$49<=$F45)*($G$50>=$E45))
BD45: @IF($A45=1,$H45*($G$50<=$E45)*($G$51>=$F45),$H45*($G$50<=$F45)*($G$51>=$E45))
BE45: @IF($A45=1,$H45*($G$51<=$E45)*($G$52>=$F45),$H45*($G$51<=$F45)*($G$52>=$E45))
BF45: @IF($A45=1,$H45*($G$52<=$E45)*($G$53>=$F45),$H45*($G$52<=$F45)*($G$53>=$E45))
BG45: @IF($A45=1,$H45*($G$53<=$E45)*($G$54>=$F45),$H45*($G$53<=$F45)*($G$54>=$E45))
BH45: @IF($A45=1,$H45*($G$54<=$E45)*($G$55>=$F45),$H45*($G$54<=$F45)*($G$55>=$E45))
BI45: @IF($A45=1,$H45*($G$55<=$E45)*($G$56>=$F45),$H45*($G$55<=$F45)*($G$56>=$E45))
BJ45: @IF($A45=1,$H45*($G$56<=$E45)*($G$57>=$F45),$H45*($G$56<=$F45)*($G$57>=$E45))
BK45: @IF($A45=1,$H45*($G$57<=$E45)*($G$58>=$F45),$H45*($G$57<=$F45)*($G$58>=$E45))
BL45: @IF($A45=1,$H45*($G$58<=$E45)*($G$59>=$F45),$H45*($G$58<=$F45)*($G$59>=$E45))
BM45: @IF($A45=1,$H45*($G$59<=$E45)*($G$60>=$F45),$H45*($G$59<=$F45)*($G$60>=$E45))
BN45: @IF($A45=1,$H45*($G$60<=$E45)*($G$61>=$F45),$H45*($G$60<=$F45)*($G$61>=$E45))
BO45: @IF($A45=1,$H45*($G$61<=$E45)*($G$62>=$F45),$H45*($G$61<=$F45)*($G$62>=$E45))
BP45: @IF($A45=1,$H45*($G$62<=$E45)*($G$63>=$F45),$H45*($G$62<=$F45)*($G$63>=$E45))
```

```
BQ45: @IF($A45=1,$H45*($G$63<=$E45)*($G$64>=$F45),$H45*($G$63<=$F45)*($G$64>=$E45))
BR45: @IF($A45=1,$H45*($G$64<=$E45)*($G$65>=$F45),$H45*($G$64<=$F45)*($G$65>=$E45))
BS45: @IF($A45=1,$H45*($G$65<=$E45)*($G$66>=$F45),$H45*($G$65<=$F45)*($G$66>=$E45))
BT45: @IF($A45=1,$H45*($G$66<=$E45)*($G$67>=$F45),$H45*($G$66<=$F45)*($G$67>=$E45))
BU45: @IF($A45=1,$H45*($G$67<=$E45)*($G$68>=$F45),$H45*($G$67<=$F45)*($G$68>=$E45))
BV45: @IF($A45=1,$H45*($G$68<=$E45)*($G$69>=$F45),$H45*($G$68<=$F45)*($G$69>=$E45))
BW45: @IF($A45=1,$H45*($G$69<=$E45)*($G$70>=$F45),$H45*($G$69<=$F45)*($G$70>=$E45))
BX45: @IF($A45=1,$H45*($G$70<=$E45)*($G$71>=$F45),$H45*($G$70<=$F45)*($G$71>=$E45))
BY45: @IF($A45=1,$H45*($G$71<=$E45)*($G$72>=$F45),$H45*($G$71<=$F45)*($G$72>=$E45))
BZ45: @IF($A45=1,$H45*($G$72<=$E45)*($G$73>=$F45),$H45*($G$72<=$F45)*($G$73>=$E45))
P46: @IF($A46=1,$H46*($G$10<=$E46)*($G$11>=$F46),$H46*($G$10<=$F46)*($G$11>=$E46))
Q46: @IF($A46=1,$H46*($G$11<=$E46)*($G$12>=$F46),$H46*($G$11<=$F46)*($G$12>=$E46))
R46: @IF($A46=1,$H46*($G$12<=$E46)*($G$13>=$F46),$H46*($G$12<=$F46)*($G$13>=$E46))
S46: @IF($A46=1,$H46*($G$13<=$E46)*($G$14>=$F46),$H46*($G$13<=$F46)*($G$14>=$E46))
T46: @IF($A46=1,$H46*($G$14<=$E46)*($G$15>=$F46),$H46*($G$14<=$F46)*($G$15>=$E46))
U46: @IF($A46=1,$H46*($G$15<=$E46)*($G$16>=$F46),$H46*($G$15<=$F46)*($G$16>=$E46))
V46: @IF($A46=1,$H46*($G$16<=$E46)*($G$17>=$F46),$H46*($G$16<=$F46)*($G$17>=$E46))
W46: @IF($A46=1,$H46*($G$17<=$E46)*($G$18>=$F46),$H46*($G$17<=$F46)*($G$18>=$E46))
X46: @IF($A46=1,$H46*($G$18<=$E46)*($G$19>=$F46),$H46*($G$18<=$F46)*($G$19>=$E46))
Y46: @IF($A46=1,$H46*($G$19<=$E46)*($G$20>=$F46),$H46*($G$19<=$F46)*($G$20>=$E46))
Z46: @IF($A46=1,$H46*($G$20<=$E46)*($G$21>=$F46),$H46*($G$20<=$F46)*($G$21>=$E46))
AA46: @IF($A46=1,$H46*($G$21<=$E46)*($G$22>=$F46),$H46*($G$21<=$F46)*($G$22>=$E46))
AB46: @IF($A46=1,$H46*($G$22<=$E46)*($G$23>=$F46),$H46*($G$22<=$F46)*($G$23>=$E46))
AC46: @IF($A46=1,$H46*($G$23<=$E46)*($G$24>=$F46),$H46*($G$23<=$F46)*($G$24>=$E46))
AD46: @IF($A46=1,$H46*($G$24<=$E46)*($G$25>=$F46),$H46*($G$24<=$F46)*($G$25>=$E46))
AE46: @IF($A46=1,$H46*($G$25<=$E46)*($G$26>=$F46),$H46*($G$25<=$F46)*($G$26>=$E46))
AF46: @IF($A46=1,$H46*($G$26<=$E46)*($G$27>=$F46),$H46*($G$26<=$F46)*($G$27>=$E46))
AG46: @IF($A46=1,$H46*($G$27<=$E46)*($G$28>=$F46),$H46*($G$27<=$F46)*($G$28>=$E46))
AH46: @IF($A46=1,$H46*($G$28<=$E46)*($G$29>=$F46),$H46*($G$28<=$F46)*($G$29>=$E46))
AI46: @IF($A46=1,$H46*($G$29<=$E46)*($G$30>=$F46),$H46*($G$29<=$F46)*($G$30>=$E46))
AJ46: @IF($A46=1,$H46*($G$30<=$E46)*($G$31>=$F46),$H46*($G$30<=$F46)*($G$31>=$E46))
AK46: @IF($A46=1,$H46*($G$31<=$E46)*($G$32>=$F46),$H46*($G$31<=$F46)*($G$32>=$E46))
AL46: @IF($A46=1,$H46*($G$32<=$E46)*($G$33>=$F46),$H46*($G$32<=$F46)*($G$33>=$E46))
AM46: @IF($A46=1,$H46*($G$33<=$E46)*($G$34>=$F46),$H46*($G$33<=$F46)*($G$34>=$E46))
AN46: @IF($A46=1,$H46*($G$34<=$E46)*($G$35>=$F46),$H46*($G$34<=$F46)*($G$35>=$E46))
AO46: @IF($A46=1,$H46*($G$35<=$E46)*($G$36>=$F46),$H46*($G$35<=$F46)*($G$36>=$E46))
AP46: @IF($A46=1,$H46*($G$36<=$E46)*($G$37>=$F46),$H46*($G$36<=$F46)*($G$37>=$E46))
AQ46: @IF($A46=1,$H46*($G$37<=$E46)*($G$38>=$F46),$H46*($G$37<=$F46)*($G$38>=$E46))
AR46: @IF($A46=1,$H46*($G$38<=$E46)*($G$39>=$F46),$H46*($G$38<=$F46)*($G$39>=$E46))
AS46: @IF($A46=1,$H46*($G$39<=$E46)*($G$40>=$F46),$H46*($G$39<=$F46)*($G$40>=$E46))
AT46: @IF($A46=1,$H46*($G$40<=$E46)*($G$41>=$F46),$H46*($G$40<=$F46)*($G$41>=$E46))
AU46: @IF($A46=1,$H46*($G$41<=$E46)*($G$42>=$F46),$H46*($G$41<=$F46)*($G$42>=$E46))
AV46: @IF($A46=1,$H46*($G$42<=$E46)*($G$43>=$F46),$H46*($G$42<=$F46)*($G$43>=$E46))
AW46: @IF($A46=1,$H46*($G$43<=$E46)*($G$44>=$F46),$H46*($G$43<=$F46)*($G$44>=$E46))
AX46: @IF($A46=1,$H46*($G$44<=$E46)*($G$45>=$F46),$H46*($G$44<=$F46)*($G$45>=$E46))
AY46: @IF($A46=1,$H46*($G$45<=$E46)*($G$46>=$F46),$H46*($G$45<=$F46)*($G$46>=$E46))
AZ46: @IF($A46=1,$H46*($G$46<=$E46)*($G$47>=$F46),$H46*($G$46<=$F46)*($G$47>=$E46))
BA46: @IF($A46=1,$H46*($G$47<=$E46)*($G$48>=$F46),$H46*($G$47<=$F46)*($G$48>=$E46))
BB46: @IF($A46=1,$H46*($G$48<=$E46)*($G$49>=$F46),$H46*($G$48<=$F46)*($G$49>=$E46))
BC46: @IF($A46=1,$H46*($G$49<=$E46)*($G$50>=$F46),$H46*($G$49<=$F46)*($G$50>=$E46))
BD46: @IF($A46=1,$H46*($G$50<=$E46)*($G$51>=$F46),$H46*($G$50<=$F46)*($G$51>=$E46))
BE46: @IF($A46=1,$H46*($G$51<=$E46)*($G$52>=$F46),$H46*($G$51<=$F46)*($G$52>=$E46))
BF46: @IF($A46=1,$H46*($G$52<=$E46)*($G$53>=$F46),$H46*($G$52<=$F46)*($G$53>=$E46))
BG46: @IF($A46=1,$H46*($G$53<=$E46)*($G$54>=$F46),$H46*($G$53<=$F46)*($G$54>=$E46))
BH46: @IF($A46=1,$H46*($G$54<=$E46)*($G$55>=$F46),$H46*($G$54<=$F46)*($G$55>=$E46))
BI46: @IF($A46=1,$H46*($G$55<=$E46)*($G$56>=$F46),$H46*($G$55<=$F46)*($G$56>=$E46))
```

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BJ46: @IF($A46=1,$H46*($G$56<=$E46)*($G$57>=$F46),$H46*($G$56<=$F46)*($G$57>=$E46))
BK46: @IF($A46=1,$H46*($G$57<=$E46)*($G$58>=$F46),$H46*($G$57<=$F46)*($G$58>=$E46))
BL46: @IF($A46=1,$H46*($G$58<=$E46)*($G$59>=$F46),$H46*($G$58<=$F46)*($G$59>=$E46))
BM46: @IF($A46=1,$H46*($G$59<=$E46)*($G$60>=$F46),$H46*($G$59<=$F46)*($G$60>=$E46))
BN46: @IF($A46=1,$H46*($G$60<=$E46)*($G$61>=$F46),$H46*($G$60<=$F46)*($G$61>=$E46))
BO46: @IF($A46=1,$H46*($G$61<=$E46)*($G$62>=$F46),$H46*($G$61<=$F46)*($G$62>=$E46))
BP46: @IF($A46=1,$H46*($G$62<=$E46)*($G$63>=$F46),$H46*($G$62<=$F46)*($G$63>=$E46))
BQ46: @IF($A46=1,$H46*($G$63<=$E46)*($G$64>=$F46),$H46*($G$63<=$F46)*($G$64>=$E46))
BR46: @IF($A46=1,$H46*($G$64<=$E46)*($G$65>=$F46),$H46*($G$64<=$F46)*($G$65>=$E46))
BS46: @IF($A46=1,$H46*($G$65<=$E46)*($G$66>=$F46),$H46*($G$65<=$F46)*($G$66>=$E46))
BT46: @IF($A46=1,$H46*($G$66<=$E46)*($G$67>=$F46),$H46*($G$66<=$F46)*($G$67>=$E46))
BU46: @IF($A46=1,$H46*($G$67<=$E46)*($G$68>=$F46),$H46*($G$67<=$F46)*($G$68>=$E46))
BV46: @IF($A46=1,$H46*($G$68<=$E46)*($G$69>=$F46),$H46*($G$68<=$F46)*($G$69>=$E46))
BW46: @IF($A46=1,$H46*($G$69<=$E46)*($G$70>=$F46),$H46*($G$69<=$F46)*($G$70>=$E46))
BX46: @IF($A46=1,$H46*($G$70<=$E46)*($G$71>=$F46),$H46*($G$70<=$F46)*($G$71>=$E46))
BY46: @IF($A46=1,$H46*($G$71<=$E46)*($G$72>=$F46),$H46*($G$71<=$F46)*($G$72>=$E46))
BZ46: @IF($A46=1,$H46*($G$72<=$E46)*($G$73>=$F46),$H46*($G$72<=$F46)*($G$73>=$E46))
P47: @IF($A47=1,$H47*($G$10<=$E47)*($G$11>=$F47),$H47*($G$10<=$F47)*($G$11>=$E47))
Q47: @IF($A47=1,$H47*($G$11<=$E47)*($G$12>=$F47),$H47*($G$11<=$F47)*($G$12>=$E47))
R47: @IF($A47=1,$H47*($G$12<=$E47)*($G$13>=$F47),$H47*($G$12<=$F47)*($G$13>=$E47))
S47: @IF($A47=1,$H47*($G$13<=$E47)*($G$14>=$F47),$H47*($G$13<=$F47)*($G$14>=$E47))
T47: @IF($A47=1,$H47*($G$14<=$E47)*($G$15>=$F47),$H47*($G$14<=$F47)*($G$15>=$E47))
U47: @IF($A47=1,$H47*($G$15<=$E47)*($G$16>=$F47),$H47*($G$15<=$F47)*($G$16>=$E47))
V47: @IF($A47=1,$H47*($G$16<=$E47)*($G$17>=$F47),$H47*($G$16<=$F47)*($G$17>=$E47))
W47: @IF($A47=1,$H47*($G$17<=$E47)*($G$18>=$F47),$H47*($G$17<=$F47)*($G$18>=$E47))
X47: @IF($A47=1,$H47*($G$18<=$E47)*($G$19>=$F47),$H47*($G$18<=$F47)*($G$19>=$E47))
Y47: @IF($A47=1,$H47*($G$19<=$E47)*($G$20>=$F47),$H47*($G$19<=$F47)*($G$20>=$E47))
Z47: @IF($A47=1,$H47*($G$20<=$E47)*($G$21>=$F47),$H47*($G$20<=$F47)*($G$21>=$E47))
AA47: @IF($A47=1,$H47*($G$21<=$E47)*($G$22>=$F47),$H47*($G$21<=$F47)*($G$22>=$E47))
AB47: @IF($A47=1,$H47*($G$22<=$E47)*($G$23>=$F47),$H47*($G$22<=$F47)*($G$23>=$E47))
AC47: @IF($A47=1,$H47*($G$23<=$E47)*($G$24>=$F47),$H47*($G$23<=$F47)*($G$24>=$E47))
AD47: @IF($A47=1,$H47*($G$24<=$E47)*($G$25>=$F47),$H47*($G$24<=$F47)*($G$25>=$E47))
AE47: @IF($A47=1,$H47*($G$25<=$E47)*($G$26>=$F47),$H47*($G$25<=$F47)*($G$26>=$E47))
AF47: @IF($A47=1,$H47*($G$26<=$E47)*($G$27>=$F47),$H47*($G$26<=$F47)*($G$27>=$E47))
AG47: @IF($A47=1,$H47*($G$27<=$E47)*($G$28>=$F47),$H47*($G$27<=$F47)*($G$28>=$E47))
AH47: @IF($A47=1,$H47*($G$28<=$E47)*($G$29>=$F47),$H47*($G$28<=$F47)*($G$29>=$E47))
AI47: @IF($A47=1,$H47*($G$29<=$E47)*($G$30>=$F47),$H47*($G$29<=$F47)*($G$30>=$E47))
AJ47: @IF($A47=1,$H47*($G$30<=$E47)*($G$31>=$F47),$H47*($G$30<=$F47)*($G$31>=$E47))
AK47: @IF($A47=1,$H47*($G$31<=$E47)*($G$32>=$F47),$H47*($G$31<=$F47)*($G$32>=$E47))
AL47: @IF($A47=1,$H47*($G$32<=$E47)*($G$33>=$F47),$H47*($G$32<=$F47)*($G$33>=$E47))
AM47: @IF($A47=1,$H47*($G$33<=$E47)*($G$34>=$F47),$H47*($G$33<=$F47)*($G$34>=$E47))
AN47: @IF($A47=1,$H47*($G$34<=$E47)*($G$35>=$F47),$H47*($G$34<=$F47)*($G$35>=$E47))
AO47: @IF($A47=1,$H47*($G$35<=$E47)*($G$36>=$F47),$H47*($G$35<=$F47)*($G$36>=$E47))
AP47: @IF($A47=1,$H47*($G$36<=$E47)*($G$37>=$F47),$H47*($G$36<=$F47)*($G$37>=$E47))
AQ47: @IF($A47=1,$H47*($G$37<=$E47)*($G$38>=$F47),$H47*($G$37<=$F47)*($G$38>=$E47))
AR47: @IF($A47=1,$H47*($G$38<=$E47)*($G$39>=$F47),$H47*($G$38<=$F47)*($G$39>=$E47))
AS47: @IF($A47=1,$H47*($G$39<=$E47)*($G$40>=$F47),$H47*($G$39<=$F47)*($G$40>=$E47))
AT47: @IF($A47=1,$H47*($G$40<=$E47)*($G$41>=$F47),$H47*($G$40<=$F47)*($G$41>=$E47))
AU47: @IF($A47=1,$H47*($G$41<=$E47)*($G$42>=$F47),$H47*($G$41<=$F47)*($G$42>=$E47))
AV47: @IF($A47=1,$H47*($G$42<=$E47)*($G$43>=$F47),$H47*($G$42<=$F47)*($G$43>=$E47))
AW47: @IF($A47=1,$H47*($G$43<=$E47)*($G$44>=$F47),$H47*($G$43<=$F47)*($G$44>=$E47))
AX47: @IF($A47=1,$H47*($G$44<=$E47)*($G$45>=$F47),$H47*($G$44<=$F47)*($G$45>=$E47))
AY47: @IF($A47=1,$H47*($G$45<=$E47)*($G$46>=$F47),$H47*($G$45<=$F47)*($G$46>=$E47))
AZ47: @IF($A47=1,$H47*($G$46<=$E47)*($G$47>=$F47),$H47*($G$46<=$F47)*($G$47>=$E47))
BA47: @IF($A47=1,$H47*($G$47<=$E47)*($G$48>=$F47),$H47*($G$47<=$F47)*($G$48>=$E47))
BB47: @IF($A47=1,$H47*($G$48<=$E47)*($G$49>=$F47),$H47*($G$48<=$F47)*($G$49>=$E47))
```

```
@IF($A47=1,$H47*($G$49<=$E47)*($G$50>=$F47),$H47*($G$49<=$F47)*($G$50>=$E47))
@IF($A47=1,$H47*($G$50<=$E47)*($G$51>=$F47),$H47*($G$50<=$F47)*($G$51>=$E47))
@IF($A47=1,$H47*($G$51<=$E47)*($G$52>=$F47),$H47*($G$51<=$F47)*($G$52>=$E47))
@IF($A47=1,$H47*($G$52<=$E47)*($G$53>=$F47),$H47*($G$52<=$F47)*($G$53>=$E47))
@IF($A47=1,$H47*($G$53<=$E47)*($G$54>=$F47),$H47*($G$53<=$F47)*($G$54>=$E47))
@IF($A47=1,$H47*($G$54<=$E47)*($G$55>=$F47),$H47*($G$54<=$F47)*($G$55>=$E47))
@IF($A47=1,$H47*($G$55<=$E47)*($G$56>=$F47),$H47*($G$55<=$F47)*($G$56>=$E47))
@IF($A47=1,$H47*($G$56<=$E47)*($G$57>=$F47),$H47*($G$56<=$F47)*($G$57>=$E47))
@IF($A47=1,$H47*($G$57<=$E47)*($G$58>=$F47),$H47*($G$57<=$F47)*($G$58>=$E47))
@IF($A47=1,$H47*($G$58<=$E47)*($G$59>=$F47),$H47*($G$58<=$F47)*($G$59>=$E47))
@IF($A47=1,$H47*($G$59<=$E47)*($G$60>=$F47),$H47*($G$59<=$F47)*($G$60>=$E47))
@IF($A47=1,$H47*($G$60<=$E47)*($G$61>=$F47),$H47*($G$60<=$F47)*($G$61>=$E47))
@IF($A47=1,$H47*($G$61<=$E47)*($G$62>=$F47),$H47*($G$61<=$F47)*($G$62>=$E47))
@IF($A47=1,$H47*($G$62<=$E47)*($G$63>=$F47),$H47*($G$62<=$F47)*($G$63>=$E47))
@IF($A47=1,$H47*($G$63<=$E47)*($G$64>=$F47),$H47*($G$63<=$F47)*($G$64>=$E47))
@IF($A47=1,$H47*($G$64<=$E47)*($G$65>=$F47),$H47*($G$64<=$F47)*($G$65>=$E47))
@IF($A47=1,$H47*($G$65<=$E47)*($G$66>=$F47),$H47*($G$65<=$F47)*($G$66>=$E47))
@IF($A47=1,$H47*($G$66<=$E47)*($G$67>=$F47),$H47*($G$66<=$F47)*($G$67>=$E47))
@IF($A47=1,$H47*($G$67<=$E47)*($G$68>=$F47),$H47*($G$67<=$F47)*($G$68>=$E47))
@IF($A47=1,$H47*($G$68<=$E47)*($G$69>=$F47),$H47*($G$68<=$F47)*($G$69>=$E47))
@IF($A47=1,$H47*($G$69<=$E47)*($G$70>=$F47),$H47*($G$69<=$F47)*($G$70>=$E47))
@IF($A47=1,$H47*($G$70<=$E47)*($G$71>=$F47),$H47*($G$70<=$F47)*($G$71>=$E47))
@IF($A47=1,$H47*($G$71<=$E47)*($G$72>=$F47),$H47*($G$71<=$F47)*($G$72>=$E47))
@IF($A47=1,$H47*($G$72<=$E47)*($G$73>=$F47),$H47*($G$72<=$F47)*($G$73>=$E47))
@IF($A48=1,$H48*($G$10<=$E48)*($G$11>=$F48),$H48*($G$10<=$F48)*($G$11>=$E48))
@IF($A48=1,$H48*($G$11<=$E48)*($G$12>=$F48),$H48*($G$11<=$F48)*($G$12>=$E48))
@IF($A48=1,$H48*($G$12<=$E48)*($G$13>=$F48),$H48*($G$12<=$F48)*($G$13>=$E48))
@IF($A48=1,$H48*($G$13<=$E48)*($G$14>=$F48),$H48*($G$13<=$F48)*($G$14>=$E48))
@IF($A48=1,$H48*($G$14<=$E48)*($G$15>=$F48),$H48*($G$14<=$F48)*($G$15>=$E48))
@IF($A48=1,$H48*($G$15<=$E48)*($G$16>=$F48),$H48*($G$15<=$F48)*($G$16>=$E48))
@IF($A48=1,$H48*($G$16<=$E48)*($G$17>=$F48),$H48*($G$16<=$F48)*($G$17>=$E48))
@IF($A48=1,$H48*($G$17<=$E48)*($G$18>=$F48),$H48*($G$17<=$F48)*($G$18>=$E48))
@IF($A48=1,$H48*($G$18<=$E48)*($G$19>=$F48),$H48*($G$18<=$F48)*($G$19>=$E48))
@IF($A48=1,$H48*($G$19<=$E48)*($G$20>=$F48),$H48*($G$19<=$F48)*($G$20>=$E48))
@IF($A48=1,$H48*($G$20<=$E48)*($G$21>=$F48),$H48*($G$20<=$F48)*($G$21>=$E48))
@IF($A48=1,$H48*($G$21<=$E48)*($G$22>=$F48),$H48*($G$21<=$F48)*($G$22>=$E48))
@IF($A48=1,$H48*($G$22<=$E48)*($G$23>=$F48),$H48*($G$22<=$F48)*($G$23>=$E48))
@IF($A48=1,$H48*($G$23<=$E48)*($G$24>=$F48),$H48*($G$23<=$F48)*($G$24>=$E48))
@IF($A48=1,$H48*($G$24<=$E48)*($G$25>=$F48),$H48*($G$24<=$F48)*($G$25>=$E48))
@IF($A48=1,$H48*($G$25<=$E48)*($G$26>=$F48),$H48*($G$25<=$F48)*($G$26>=$E48))
@IF($A48=1,$H48*($G$26<=$E48)*($G$27>=$F48),$H48*($G$26<=$F48)*($G$27>=$E48))
@IF($A48=1,$H48*($G$27<=$E48)*($G$28>=$F48),$H48*($G$27<=$F48)*($G$28>=$E48))
@IF($A48=1,$H48*($G$28<=$E48)*($G$29>=$F48),$H48*($G$28<=$F48)*($G$29>=$E48))
@IF($A48=1,$H48*($G$29<=$E48)*($G$30>=$F48),$H48*($G$29<=$F48)*($G$30>=$E48))
@IF($A48=1,$H48*($G$30<=$E48)*($G$31>=$F48),$H48*($G$30<=$F48)*($G$31>=$E48))
@IF($A48=1,$H48*($G$31<=$E48)*($G$32>=$F48),$H48*($G$31<=$F48)*($G$32>=$E48))
@IF($A48=1,$H48*($G$32<=$E48)*($G$33>=$F48),$H48*($G$32<=$F48)*($G$33>=$E48))
@IF($A48=1,$H48*($G$33<=$E48)*($G$34>=$F48),$H48*($G$33<=$F48)*($G$34>=$E48))
@IF($A48=1,$H48*($G$34<=$E48)*($G$35>=$F48),$H48*($G$34<=$F48)*($G$35>=$E48))
@IF($A48=1,$H48*($G$35<=$E48)*($G$36>=$F48),$H48*($G$35<=$F48)*($G$36>=$E48))
@IF($A48=1,$H48*($G$36<=$E48)*($G$37>=$F48),$H48*($G$36<=$F48)*($G$37>=$E48))
@IF($A48=1,$H48*($G$37<=$E48)*($G$38>=$F48),$H48*($G$37<=$F48)*($G$38>=$E48))
@IF($A48=1,$H48*($G$38<=$E48)*($G$39>=$F48),$H48*($G$38<=$F48)*($G$39>=$E48))
@IF($A48=1,$H48*($G$39<=$E48)*($G$40>=$F48),$H48*($G$39<=$F48)*($G$40>=$E48))
@IF($A48=1,$H48*($G$40<=$E48)*($G$41>=$F48),$H48*($G$40<=$F48)*($G$41>=$E48))
@IF($A48=1,$H48*($G$41<=$E48)*($G$42>=$F48),$H48*($G$41<=$F48)*($G$42>=$E48))
```

```
AV48: @IF($A48=1,$H48*($G$42<=$E48)*($G$43>=$F48),$H48*($G$42<=$F48)*($G$43>=$E48))
AW48: @IF($A48=1,$H48*($G$43<=$E48)*($G$44>=$F48),$H48*($G$43<=$F48)*($G$44>=$E48))
AX48: @IF($A48=1,$H48*($G$44<=$E48)*($G$45>=$F48),$H48*($G$44<=$F48)*($G$45>=$E48))
AY48: @IF($A48=1,$H48*($G$45<=$E48)*($G$46>=$F48),$H48*($G$45<=$F48)*($G$46>=$E48))
AZ48: @IF($A48=1,$H48*($G$46<=$E48)*($G$47>=$F48),$H48*($G$46<=$F48)*($G$47>=$E48))
BA48: @IF($A48=1,$H48*($G$47<=$E48)*($G$48>=$F48),$H48*($G$47<=$F48)*($G$48>=$E48))
BB48: @IF($A48=1,$H48*($G$48<=$E48)*($G$49>=$F48),$H48*($G$48<=$F48)*($G$49>=$E48))
BC48: @IF($A48=1,$H48*($G$49<=$E48)*($G$50>=$F48),$H48*($G$49<=$F48)*($G$50>=$E48))
BD48: @IF($A48=1,$H48*($G$50<=$E48)*($G$51>=$F48),$H48*($G$50<=$F48)*($G$51>=$E48))
BE48: @IF($A48=1,$H48*($G$51<=$E48)*($G$52>=$F48),$H48*($G$51<=$F48)*($G$52>=$E48))
BF48: @IF($A48=1,$H48*($G$52<=$E48)*($G$53>=$F48),$H48*($G$52<=$F48)*($G$53>=$E48))
BG48: @IF($A48=1,$H48*($G$53<=$E48)*($G$54>=$F48),$H48*($G$53<=$F48)*($G$54>=$E48))
BH48: @IF($A48=1,$H48*($G$54<=$E48)*($G$55>=$F48),$H48*($G$54<=$F48)*($G$55>=$E48))
BI48: @IF($A48=1,$H48*($G$55<=$E48)*($G$56>=$F48),$H48*($G$55<=$F48)*($G$56>=$E48))
BJ48: @IF($A48=1,$H48*($G$56<=$E48)*($G$57>=$F48),$H48*($G$56<=$F48)*($G$57>=$E48))
BK48: @IF($A48=1,$H48*($G$57<=$E48)*($G$58>=$F48),$H48*($G$57<=$F48)*($G$58>=$E48))
BL48: @IF($A48=1,$H48*($G$58<=$E48)*($G$59>=$F48),$H48*($G$58<=$F48)*($G$59>=$E48))
BM48: @IF($A48=1,$H48*($G$59<=$E48)*($G$60>=$F48),$H48*($G$59<=$F48)*($G$60>=$E48))
BN48: @IF($A48=1,$H48*($G$60<=$E48)*($G$61>=$F48),$H48*($G$60<=$F48)*($G$61>=$E48))
BO48: @IF($A48=1,$H48*($G$61<=$E48)*($G$62>=$F48),$H48*($G$61<=$F48)*($G$62>=$E48))
BP48: @IF($A48=1,$H48*($G$62<=$E48)*($G$63>=$F48),$H48*($G$62<=$F48)*($G$63>=$E48))
BQ48: @IF($A48=1,$H48*($G$63<=$E48)*($G$64>=$F48),$H48*($G$63<=$F48)*($G$64>=$E48))
BR48: @IF($A48=1,$H48*($G$64<=$E48)*($G$65>=$F48),$H48*($G$64<=$F48)*($G$65>=$E48))
BS48: @IF($A48=1,$H48*($G$65<=$E48)*($G$66>=$F48),$H48*($G$65<=$F48)*($G$66>=$E48))
BT48: @IF($A48=1,$H48*($G$66<=$E48)*($G$67>=$F48),$H48*($G$66<=$F48)*($G$67>=$E48))
BU48: @IF($A48=1,$H48*($G$67<=$E48)*($G$68>=$F48),$H48*($G$67<=$F48)*($G$68>=$E48))
BV48: @IF($A48=1,$H48*($G$68<=$E48)*($G$69>=$F48),$H48*($G$68<=$F48)*($G$69>=$E48))
BW48: @IF($A48=1,$H48*($G$69<=$E48)*($G$70>=$F48),$H48*($G$69<=$F48)*($G$70>=$E48))
BX48: @IF($A48=1,$H48*($G$70<=$E48)*($G$71>=$F48),$H48*($G$70<=$F48)*($G$71>=$E48))
BY48: @IF($A48=1,$H48*($G$71<=$E48)*($G$72>=$F48),$H48*($G$71<=$F48)*($G$72>=$E48))
BZ48: @IF($A48=1,$H48*($G$72<=$E48)*($G$73>=$F48),$H48*($G$72<=$F48)*($G$73>=$E48))
P49: @IF($A49=1,$H49*($G$10<=$E49)*($G$11>=$F49),$H49*($G$10<=$F49)*($G$11>=$E49))
Q49: @IF($A49=1,$H49*($G$11<=$E49)*($G$12>=$F49),$H49*($G$11<=$F49)*($G$12>=$E49))
R49: @IF($A49=1,$H49*($G$12<=$E49)*($G$13>=$F49),$H49*($G$12<=$F49)*($G$13>=$E49))
S49: @IF($A49=1,$H49*($G$13<=$E49)*($G$14>=$F49),$H49*($G$13<=$F49)*($G$14>=$E49))
T49: @IF($A49=1,$H49*($G$14<=$E49)*($G$15>=$F49),$H49*($G$14<=$F49)*($G$15>=$E49))
U49: @IF($A49=1,$H49*($G$15<=$E49)*($G$16>=$F49),$H49*($G$15<=$F49)*($G$16>=$E49))
V49: @IF($A49=1,$H49*($G$16<=$E49)*($G$17>=$F49),$H49*($G$16<=$F49)*($G$17>=$E49))
W49: @IF($A49=1,$H49*($G$17<=$E49)*($G$18>=$F49),$H49*($G$17<=$F49)*($G$18>=$E49))
X49: @IF($A49=1,$H49*($G$18<=$E49)*($G$19>=$F49),$H49*($G$18<=$F49)*($G$19>=$E49))
Y49: @IF($A49=1,$H49*($G$19<=$E49)*($G$20>=$F49),$H49*($G$19<=$F49)*($G$20>=$E49))
Z49: @IF($A49=1,$H49*($G$20<=$E49)*($G$21>=$F49),$H49*($G$20<=$F49)*($G$21>=$E49))
AA49: @IF($A49=1,$H49*($G$21<=$E49)*($G$22>=$F49),$H49*($G$21<=$F49)*($G$22>=$E49))
AB49: @IF($A49=1,$H49*($G$22<=$E49)*($G$23>=$F49),$H49*($G$22<=$F49)*($G$23>=$E49))
AC49: @IF($A49=1,$H49*($G$23<=$E49)*($G$24>=$F49),$H49*($G$23<=$F49)*($G$24>=$E49))
AD49: @IF($A49=1,$H49*($G$24<=$E49)*($G$25>=$F49),$H49*($G$24<=$F49)*($G$25>=$E49))
AE49: @IF($A49=1,$H49*($G$25<=$E49)*($G$26>=$F49),$H49*($G$25<=$F49)*($G$26>=$E49))
AF49: @IF($A49=1,$H49*($G$26<=$E49)*($G$27>=$F49),$H49*($G$26<=$F49)*($G$27>=$E49))
AG49: @IF($A49=1,$H49*($G$27<=$E49)*($G$28>=$F49),$H49*($G$27<=$F49)*($G$28>=$E49))
AH49: @IF($A49=1,$H49*($G$28<=$E49)*($G$29>=$F49),$H49*($G$28<=$F49)*($G$29>=$E49))
AI49: @IF($A49=1,$H49*($G$29<=$E49)*($G$30>=$F49),$H49*($G$29<=$F49)*($G$30>=$E49))
AJ49: @IF($A49=1,$H49*($G$30<=$E49)*($G$31>=$F49),$H49*($G$30<=$F49)*($G$31>=$E49))
AK49: @IF($A49=1,$H49*($G$31<=$E49)*($G$32>=$F49),$H49*($G$31<=$F49)*($G$32>=$E49))
AL49: @IF($A49=1,$H49*($G$32<=$E49)*($G$33>=$F49),$H49*($G$32<=$F49)*($G$33>=$E49))
AM49: @IF($A49=1,$H49*($G$33<=$E49)*($G$34>=$F49),$H49*($G$33<=$F49)*($G$34>=$E49))
AN49: @IF($A49=1,$H49*($G$34<=$E49)*($G$35>=$F49),$H49*($G$34<=$F49)*($G$35>=$E49))
```

```
@IF($A49=1,$H49*($G$35<=$E49)*($G$36>=$F49),$H49*($G$35<=$F49)*($G$36>=$E49))
@IF($A49=1,$H49*($G$36<=$E49)*($G$37>=$F49),$H49*($G$36<=$F49)*($G$37>=$E49))
@IF($A49=1,$H49*($G$37<=$E49)*($G$38>=$F49),$H49*($G$37<=$F49)*($G$38>=$E49))
@IF($A49=1,$H49*($G$38<=$E49)*($G$39>=$F49),$H49*($G$38<=$F49)*($G$39>=$E49))
@IF($A49=1,$H49*($G$39<=$E49)*($G$40>=$F49),$H49*($G$39<=$F49)*($G$40>=$E49))
@IF($A49=1,$H49*($G$40<=$E49)*($G$41>=$F49),$H49*($G$40<=$F49)*($G$41>=$E49))
@IF($A49=1,$H49*($G$41<=$E49)*($G$42>=$F49),$H49*($G$41<=$F49)*($G$42>=$E49))
@IF($A49=1,$H49*($G$42<=$E49)*($G$43>=$F49),$H49*($G$42<=$F49)*($G$43>=$E49))
: @IF($A49=1,$H49*($G$43<=$E49)*($G$44>=$F49),$H49*($G$43<=$F49)*($G$44>=$E49))
: @IF($A49=1,$H49*($G$44<=$E49)*($G$45>=$F49),$H49*($G$44<=$F49)*($G$45>=$E49))
: @IF($A49=1,$H49*($G$45<=$E49)*($G$46>=$F49),$H49*($G$45<=$F49)*($G$46>=$E49))
: @IF($A49=1,$H49*($G$46<=$E49)*($G$47>=$F49),$H49*($G$46<=$F49)*($G$47>=$E49))
: @IF($A49=1,$H49*($G$47<=$E49)*($G$48>=$F49),$H49*($G$47<=$F49)*($G$48>=$E49))
: @IF($A49=1,$H49*($G$48<=$E49)*($G$49>=$F49),$H49*($G$48<=$F49)*($G$49>=$E49))
: @IF($A49=1,$H49*($G$49<=$E49)*($G$50>=$F49),$H49*($G$49<=$F49)*($G$50>=$E49))
: @IF($A49=1,$H49*($G$50<=$E49)*($G$51>=$F49),$H49*($G$50<=$F49)*($G$51>=$E49))
: @IF($A49=1,$H49*($G$51<=$E49)*($G$52>=$F49),$H49*($G$51<=$F49)*($G$52>=$E49))
: @IF($A49=1,$H49*($G$52<=$E49)*($G$53>=$F49),$H49*($G$52<=$F49)*($G$53>=$E49))
: @IF($A49=1,$H49*($G$53<=$E49)*($G$54>=$F49),$H49*($G$53<=$F49)*($G$54>=$E49))
: @IF($A49=1,$H49*($G$54<=$E49)*($G$55>=$F49),$H49*($G$54<=$F49)*($G$55>=$E49))
: @IF($A49=1,$H49*($G$55<=$E49)*($G$56>=$F49),$H49*($G$55<=$F49)*($G$56>=$E49))
: @IF($A49=1,$H49*($G$56<=$E49)*($G$57>=$F49),$H49*($G$56<=$F49)*($G$57>=$E49))
: @IF($A49=1,$H49*($G$57<=$E49)*($G$58>=$F49),$H49*($G$57<=$F49)*($G$58>=$E49))
: @IF($A49=1,$H49*($G$58<=$E49)*($G$59>=$F49),$H49*($G$58<=$F49)*($G$59>=$E49))
: @IF($A49=1,$H49*($G$59<=$E49)*($G$60>=$F49),$H49*($G$59<=$F49)*($G$60>=$E49))
: @IF($A49=1,$H49*($G$60<=$E49)*($G$61>=$F49),$H49*($G$60<=$F49)*($G$61>=$E49))
: @IF($A49=1,$H49*($G$61<=$E49)*($G$62>=$F49),$H49*($G$61<=$F49)*($G$62>=$E49))
: @IF($A49=1,$H49*($G$62<=$E49)*($G$63>=$F49),$H49*($G$62<=$F49)*($G$63>=$E49))
: @IF($A49=1,$H49*($G$63<=$E49)*($G$64>=$F49),$H49*($G$63<=$F49)*($G$64>=$E49))
: @IF($A49=1,$H49*($G$64<=$E49)*($G$65>=$F49),$H49*($G$64<=$F49)*($G$65>=$E49))
: @IF($A49=1,$H49*($G$65<=$E49)*($G$66>=$F49),$H49*($G$65<=$F49)*($G$66>=$E49))
: @IF($A49=1,$H49*($G$66<=$E49)*($G$67>=$F49),$H49*($G$66<=$F49)*($G$67>=$E49))
: @IF($A49=1,$H49*($G$67<=$E49)*($G$68>=$F49),$H49*($G$67<=$F49)*($G$68>=$E49))
: @IF($A49=1,$H49*($G$68<=$E49)*($G$69>=$F49),$H49*($G$68<=$F49)*($G$69>=$E49))
: @IF($A49=1,$H49*($G$69<=$E49)*($G$70>=$F49),$H49*($G$69<=$F49)*($G$70>=$E49))
: @IF($A49=1,$H49*($G$70<=$E49)*($G$71>=$F49),$H49*($G$70<=$F49)*($G$71>=$E49))
: @IF($A49=1,$H49*($G$71<=$E49)*($G$72>=$F49),$H49*($G$71<=$F49)*($G$72>=$E49))
: @IF($A49=1,$H49*($G$72<=$E49)*($G$73>=$F49),$H49*($G$72<=$F49)*($G$73>=$E49))
: @IF($A50=1,$H50*($G$10<=$E50)*($G$11>=$F50),$H50*($G$10<=$F50)*($G$11>=$E50))
: @IF($A50=1,$H50*($G$11<=$E50)*($G$12>=$F50),$H50*($G$11<=$F50)*($G$12>=$E50))
: @IF($A50=1,$H50*($G$12<=$E50)*($G$13>=$F50),$H50*($G$12<=$F50)*($G$13>=$E50))
: @IF($A50=1,$H50*($G$13<=$E50)*($G$14>=$F50),$H50*($G$13<=$F50)*($G$14>=$E50))
: @IF($A50=1,$H50*($G$14<=$E50)*($G$15>=$F50),$H50*($G$14<=$F50)*($G$15>=$E50))
): @IF($A50=1,$H50*($G$15<=$E50)*($G$16>=$F50),$H50*($G$15<=$F50)*($G$16>=$E50))
): @IF($A50=1,$H50*($G$16<=$E50)*($G$17>=$F50),$H50*($G$16<=$F50)*($G$17>=$E50))
): @IF($A50=1,$H50*($G$17<=$E50)*($G$18>=$F50),$H50*($G$17<=$F50)*($G$18>=$E50))
): @IF($A50=1,$H50*($G$18<=$E50)*($G$19>=$F50),$H50*($G$18<=$F50)*($G$19>=$E50))
): @IF($A50=1,$H50*($G$19<=$E50)*($G$20>=$F50),$H50*($G$19<=$F50)*($G$20>=$E50))
): @IF($A50=1,$H50*($G$20<=$E50)*($G$21>=$F50),$H50*($G$20<=$F50)*($G$21>=$E50))
50: @IF($A50=1,$H50*($G$21<=$E50)*($G$22>=$F50),$H50*($G$21<=$F50)*($G$22>=$E50))
50: @IF($A50=1,$H50*($G$22<=$E50)*($G$23>=$F50),$H50*($G$22<=$F50)*($G$23>=$E50))
50: @IF($A50=1,$H50*($G$23<=$E50)*($G$24>=$F50),$H50*($G$23<=$F50)*($G$24>=$E50))
50: @IF($A50=1,$H50*($G$24<=$E50)*($G$25>=$F50),$H50*($G$24<=$F50)*($G$25>=$E50))
50: @IF($A50=1,$H50*($G$25<=$E50)*($G$26>=$F50),$H50*($G$25<=$F50)*($G$26>=$E50))
50: @IF($A50=1,$H50*($G$26<=$E50)*($G$27>=$F50),$H50*($G$26<=$F50)*($G$27>=$E50))
50: @IF($A50=1,$H50*($G$27<=$E50)*($G$28>=$F50),$H50*($G$27<=$F50)*($G$28>=$E50))
```

```
AH50: @IF($A50=1,$H50*($G$28<=$E50)*($G$29>=$F50),$H50*($G$28<=$F50)*($G$29>=$E50))
AI50: @IF($A50=1,$H50*($G$29<=$E50)*($G$30>=$F50),$H50*($G$29<=$F50)*($G$30>=$E50))
AJ50: @IF($A50=1,$H50*($G$30<=$E50)*($G$31>=$F50),$H50*($G$30<=$F50)*($G$31>=$E50))
AK50: @IF($A50=1,$H50*($G$31<=$E50)*($G$32>=$F50),$H50*($G$31<=$F50)*($G$32>=$E50))
AL50: @IF($A50=1,$H50*($G$32<=$E50)*($G$33>=$F50),$H50*($G$32<=$F50)*($G$33>=$E50))
AM50: @IF($A50=1,$H50*($G$33<=$E50)*($G$34>=$F50),$H50*($G$33<=$F50)*($G$34>=$E50))
AN50: @IF($A50=1,$H50*($G$34<=$E50)*($G$35>=$F50),$H50*($G$34<=$F50)*($G$35>=$E50))
AO50: @IF($A50=1,$H50*($G$35<=$E50)*($G$36>=$F50),$H50*($G$35<=$F50)*($G$36>=$E50))
AP50: @IF($A50=1,$H50*($G$36<=$E50)*($G$37>=$F50),$H50*($G$36<=$F50)*($G$37>=$E50))
AQ50: @IF($A50=1,$H50*($G$37<=$E50)*($G$38>=$F50),$H50*($G$37<=$F50)*($G$38>=$E50))
AR50: @IF($A50=1,$H50*($G$38<=$E50)*($G$39>=$F50),$H50*($G$38<=$F50)*($G$39>=$E50))
AS50: @IF($A50=1,$H50*($G$39<=$E50)*($G$40>=$F50),$H50*($G$39<=$F50)*($G$40>=$E50))
AT50: @IF($A50=1,$H50*($G$40<=$E50)*($G$41>=$F50),$H50*($G$40<=$F50)*($G$41>=$E50))
AU50: @IF($A50=1,$H50*($G$41<=$E50)*($G$42>=$F50),$H50*($G$41<=$F50)*($G$42>=$E50))
AV50: @IF($A50=1,$H50*($G$42<=$E50)*($G$43>=$F50),$H50*($G$42<=$F50)*($G$43>=$E50))
AW50: @IF($A50=1,$H50*($G$43<=$E50)*($G$44>=$F50),$H50*($G$43<=$F50)*($G$44>=$E50))
AX50: @IF($A50=1,$H50*($G$44<=$E50)*($G$45>=$F50),$H50*($G$44<=$F50)*($G$45>=$E50))
AY50: @IF($A50=1,$H50*($G$45<=$E50)*($G$46>=$F50),$H50*($G$45<=$F50)*($G$46>=$E50))
AZ50: @IF($A50=1,$H50*($G$46<=$E50)*($G$47>=$F50),$H50*($G$46<=$F50)*($G$47>=$E50))
BA50: @IF($A50=1,$H50*($G$47<=$E50)*($G$48>=$F50),$H50*($G$47<=$F50)*($G$48>=$E50))
BB50: @IF($A50=1,$H50*($G$48<=$E50)*($G$49>=$F50),$H50*($G$48<=$F50)*($G$49>=$E50))
BC50: @IF($A50=1,$H50*($G$49<=$E50)*($G$50>=$F50),$H50*($G$49<=$F50)*($G$50>=$E50))
BD50: @IF($A50=1,$H50*($G$50<=$E50)*($G$51>=$F50),$H50*($G$50<=$F50)*($G$51>=$E50))
BE50: @IF($A50=1,$H50*($G$51<=$E50)*($G$52>=$F50),$H50*($G$51<=$F50)*($G$52>=$E50))
BF50: @IF($A50=1,$H50*($G$52<=$E50)*($G$53>=$F50),$H50*($G$52<=$F50)*($G$53>=$E50))
BG50: @IF($A50=1,$H50*($G$53<=$E50)*($G$54>=$F50),$H50*($G$53<=$F50)*($G$54>=$E50))
BH50: @IF($A50=1,$H50*($G$54<=$E50)*($G$55>=$F50),$H50*($G$54<=$F50)*($G$55>=$E50))
BI50: @IF($A50=1,$H50*($G$55<=$E50)*($G$56>=$F50),$H50*($G$55<=$F50)*($G$56>=$E50))
BJ50: @IF($A50=1,$H50*($G$56<=$E50)*($G$57>=$F50),$H50*($G$56<=$F50)*($G$57>=$E50))
BK50: @IF($A50=1,$H50*($G$57<=$E50)*($G$58>=$F50),$H50*($G$57<=$F50)*($G$58>=$E50))
BL50: @IF($A50=1,$H50*($G$58<=$E50)*($G$59>=$F50),$H50*($G$58<=$F50)*($G$59>=$E50))
BM50: @IF($A50=1,$H50*($G$59<=$E50)*($G$60>=$F50),$H50*($G$59<=$F50)*($G$60>=$E50))
BN50: @IF($A50=1,$H50*($G$60<=$E50)*($G$61>=$F50),$H50*($G$60<=$F50)*($G$61>=$E50))
BO50: @IF($A50=1,$H50*($G$61<=$E50)*($G$62>=$F50),$H50*($G$61<=$F50)*($G$62>=$E50))
BP50: @IF($A50=1,$H50*($G$62<=$E50)*($G$63>=$F50),$H50*($G$62<=$F50)*($G$63>=$E50))
BQ50: @IF($A50=1,$H50*($G$63<=$E50)*($G$64>=$F50),$H50*($G$63<=$F50)*($G$64>=$E50))
BR50: @IF($A50=1,$H50*($G$64<=$E50)*($G$65>=$F50),$H50*($G$64<=$F50)*($G$65>=$E50))
BS50: @IF($A50=1,$H50*($G$65<=$E50)*($G$66>=$F50),$H50*($G$65<=$F50)*($G$66>=$E50))
BT50: @IF($A50=1,$H50*($G$66<=$E50)*($G$67>=$F50),$H50*($G$66<=$F50)*($G$67>=$E50))
BU50: @IF($A50=1,$H50*($G$67<=$E50)*($G$68>=$F50),$H50*($G$67<=$F50)*($G$68>=$E50))
BV50: @IF($A50=1,$H50*($G$68<=$E50)*($G$69>=$F50),$H50*($G$68<=$F50)*($G$69>=$E50))
BW50: @IF($A50=1,$H50*($G$69<=$E50)*($G$70>=$F50),$H50*($G$69<=$F50)*($G$70>=$E50))
BX50: @IF($A50=1,$H50*($G$70<=$E50)*($G$71>=$F50),$H50*($G$70<=$F50)*($G$71>=$E50))
BY50: @IF($A50=1,$H50*($G$71<=$E50)*($G$72>=$F50),$H50*($G$71<=$F50)*($G$72>=$E50))
BZ50: @IF($A50=1,$H50*($G$72<=$E50)*($G$73>=$F50),$H50*($G$72<=$F50)*($G$73>=$E50))
P51: @IF($A51=1,$H51*($G$10<=$E51)*($G$11>=$F51),$H51*($G$10<=$F51)*($G$11>=$E51))
Q51: @IF($A51=1,$H51*($G$11<=$E51)*($G$12>=$F51),$H51*($G$11<=$F51)*($G$12>=$E51))
R51: @IF($A51=1,$H51*($G$12<=$E51)*($G$13>=$F51),$H51*($G$12<=$F51)*($G$13>=$E51))
S51: @IF($A51=1,$H51*($G$13<=$E51)*($G$14>=$F51),$H51*($G$13<=$F51)*($G$14>=$E51))
T51: @IF($A51=1,$H51*($G$14<=$E51)*($G$15>=$F51),$H51*($G$14<=$F51)*($G$15>=$E51))
U51: @IF($A51=1,$H51*($G$15<=$E51)*($G$16>=$F51),$H51*($G$15<=$F51)*($G$16>=$E51))
V51: @IF($A51=1,$H51*($G$16<=$E51)*($G$17>=$F51),$H51*($G$16<=$F51)*($G$17>=$E51))
W51: @IF($A51=1,$H51*($G$17<=$E51)*($G$18>=$F51),$H51*($G$17<=$F51)*($G$18>=$E51))
X51: @IF($A51=1,$H51*($G$18<=$E51)*($G$19>=$F51),$H51*($G$18<=$F51)*($G$19>=$E51))
Y51: @IF($A51=1,$H51*($G$19<=$E51)*($G$20>=$F51),$H51*($G$19<=$F51)*($G$20>=$E51))
Z51: @IF($A51=1,$H51*($G$20<=$E51)*($G$21>=$F51),$H51*($G$20<=$F51)*($G$21>=$E51))
```

AA51: @IF($A51=1,$H51*($G$21<=$E51)*($G$22>=$F51),$H51*($G$21<=$F51)*($G$22>=$E51))
AB51: @IF($A51=1,$H51*($G$22<=$E51)*($G$23>=$F51),$H51*($G$22<=$F51)*($G$23>=$E51))
AC51: @IF($A51=1,$H51*($G$23<=$E51)*($G$24>=$F51),$H51*($G$23<=$F51)*($G$24>=$E51))
AD51: @IF($A51=1,$H51*($G$24<=$E51)*($G$25>=$F51),$H51*($G$24<=$F51)*($G$25>=$E51))
AE51: @IF($A51=1,$H51*($G$25<=$E51)*($G$26>=$F51),$H51*($G$25<=$F51)*($G$26>=$E51))
AF51: @IF($A51=1,$H51*($G$26<=$E51)*($G$27>=$F51),$H51*($G$26<=$F51)*($G$27>=$E51))
AG51: @IF($A51=1,$H51*($G$27<=$E51)*($G$28>=$F51),$H51*($G$27<=$F51)*($G$28>=$E51))
AH51: @IF($A51=1,$H51*($G$28<=$E51)*($G$29>=$F51),$H51*($G$28<=$F51)*($G$29>=$E51))
AI51: @IF($A51=1,$H51*($G$29<=$E51)*($G$30>=$F51),$H51*($G$29<=$F51)*($G$30>=$E51))
AJ51: @IF($A51=1,$H51*($G$30<=$E51)*($G$31>=$F51),$H51*($G$30<=$F51)*($G$31>=$E51))
AK51: @IF($A51=1,$H51*($G$31<=$E51)*($G$32>=$F51),$H51*($G$31<=$F51)*($G$32>=$E51))
AL51: @IF($A51=1,$H51*($G$32<=$E51)*($G$33>=$F51),$H51*($G$32<=$F51)*($G$33>=$E51))
AM51: @IF($A51=1,$H51*($G$33<=$E51)*($G$34>=$F51),$H51*($G$33<=$F51)*($G$34>=$E51))
AN51: @IF($A51=1,$H51*($G$34<=$E51)*($G$35>=$F51),$H51*($G$34<=$F51)*($G$35>=$E51))
AO51: @IF($A51=1,$H51*($G$35<=$E51)*($G$36>=$F51),$H51*($G$35<=$F51)*($G$36>=$E51))
AP51: @IF($A51=1,$H51*($G$36<=$E51)*($G$37>=$F51),$H51*($G$36<=$F51)*($G$37>=$E51))
AQ51: @IF($A51=1,$H51*($G$37<=$E51)*($G$38>=$F51),$H51*($G$37<=$F51)*($G$38>=$E51))
AR51: @IF($A51=1,$H51*($G$38<=$E51)*($G$39>=$F51),$H51*($G$38<=$F51)*($G$39>=$E51))
AS51: @IF($A51=1,$H51*($G$39<=$E51)*($G$40>=$F51),$H51*($G$39<=$F51)*($G$40>=$E51))
AT51: @IF($A51=1,$H51*($G$40<=$E51)*($G$41>=$F51),$H51*($G$40<=$F51)*($G$41>=$E51))
AU51: @IF($A51=1,$H51*($G$41<=$E51)*($G$42>=$F51),$H51*($G$41<=$F51)*($G$42>=$E51))
AV51: @IF($A51=1,$H51*($G$42<=$E51)*($G$43>=$F51),$H51*($G$42<=$F51)*($G$43>=$E51))
AW51: @IF($A51=1,$H51*($G$43<=$E51)*($G$44>=$F51),$H51*($G$43<=$F51)*($G$44>=$E51))
AX51: @IF($A51=1,$H51*($G$44<=$E51)*($G$45>=$F51),$H51*($G$44<=$F51)*($G$45>=$E51))
AY51: @IF($A51=1,$H51*($G$45<=$E51)*($G$46>=$F51),$H51*($G$45<=$F51)*($G$46>=$E51))
AZ51: @IF($A51=1,$H51*($G$46<=$E51)*($G$47>=$F51),$H51*($G$46<=$F51)*($G$47>=$E51))
BA51: @IF($A51=1,$H51*($G$47<=$E51)*($G$48>=$F51),$H51*($G$47<=$F51)*($G$48>=$E51))
BB51: @IF($A51=1,$H51*($G$48<=$E51)*($G$49>=$F51),$H51*($G$48<=$F51)*($G$49>=$E51))
BC51: @IF($A51=1,$H51*($G$49<=$E51)*($G$50>=$F51),$H51*($G$49<=$F51)*($G$50>=$E51))
BD51: @IF($A51=1,$H51*($G$50<=$E51)*($G$51>=$F51),$H51*($G$50<=$F51)*($G$51>=$E51))
BE51: @IF($A51=1,$H51*($G$51<=$E51)*($G$52>=$F51),$H51*($G$51<=$F51)*($G$52>=$E51))
BF51: @IF($A51=1,$H51*($G$52<=$E51)*($G$53>=$F51),$H51*($G$52<=$F51)*($G$53>=$E51))
BG51: @IF($A51=1,$H51*($G$53<=$E51)*($G$54>=$F51),$H51*($G$53<=$F51)*($G$54>=$E51))
BH51: @IF($A51=1,$H51*($G$54<=$E51)*($G$55>=$F51),$H51*($G$54<=$F51)*($G$55>=$E51))
BI51: @IF($A51=1,$H51*($G$55<=$E51)*($G$56>=$F51),$H51*($G$55<=$F51)*($G$56>=$E51))
BJ51: @IF($A51=1,$H51*($G$56<=$E51)*($G$57>=$F51),$H51*($G$56<=$F51)*($G$57>=$E51))
BK51: @IF($A51=1,$H51*($G$57<=$E51)*($G$58>=$F51),$H51*($G$57<=$F51)*($G$58>=$E51))
BL51: @IF($A51=1,$H51*($G$58<=$E51)*($G$59>=$F51),$H51*($G$58<=$F51)*($G$59>=$E51))
BM51: @IF($A51=1,$H51*($G$59<=$E51)*($G$60>=$F51),$H51*($G$59<=$F51)*($G$60>=$E51))
BN51: @IF($A51=1,$H51*($G$60<=$E51)*($G$61>=$F51),$H51*($G$60<=$F51)*($G$61>=$E51))
BO51: @IF($A51=1,$H51*($G$61<=$E51)*($G$62>=$F51),$H51*($G$61<=$F51)*($G$62>=$E51))
BP51: @IF($A51=1,$H51*($G$62<=$E51)*($G$63>=$F51),$H51*($G$62<=$F51)*($G$63>=$E51))
BQ51: @IF($A51=1,$H51*($G$63<=$E51)*($G$64>=$F51),$H51*($G$63<=$F51)*($G$64>=$E51))
BR51: @IF($A51=1,$H51*($G$64<=$E51)*($G$65>=$F51),$H51*($G$64<=$F51)*($G$65>=$E51))
BS51: @IF($A51=1,$H51*($G$65<=$E51)*($G$66>=$F51),$H51*($G$65<=$F51)*($G$66>=$E51))
BT51: @IF($A51=1,$H51*($G$66<=$E51)*($G$67>=$F51),$H51*($G$66<=$F51)*($G$67>=$E51))
BU51: @IF($A51=1,$H51*($G$67<=$E51)*($G$68>=$F51),$H51*($G$67<=$F51)*($G$68>=$E51))
BV51: @IF($A51=1,$H51*($G$68<=$E51)*($G$69>=$F51),$H51*($G$68<=$F51)*($G$69>=$E51))
BW51: @IF($A51=1,$H51*($G$69<=$E51)*($G$70>=$F51),$H51*($G$69<=$F51)*($G$70>=$E51))
BX51: @IF($A51=1,$H51*($G$70<=$E51)*($G$71>=$F51),$H51*($G$70<=$F51)*($G$71>=$E51))
BY51: @IF($A51=1,$H51*($G$71<=$E51)*($G$72>=$F51),$H51*($G$71<=$F51)*($G$72>=$E51))
BZ51: @IF($A51=1,$H51*($G$72<=$E51)*($G$73>=$F51),$H51*($G$72<=$F51)*($G$73>=$E51))
P52: @IF($A52=1,$H52*($G$10<=$E52)*($G$11>=$F52),$H52*($G$10<=$F52)*($G$11>=$E52))
Q52: @IF($A52=1,$H52*($G$11<=$E52)*($G$12>=$F52),$H52*($G$11<=$F52)*($G$12>=$E52))
R52: @IF($A52=1,$H52*($G$12<=$E52)*($G$13>=$F52),$H52*($G$12<=$F52)*($G$13>=$E52))
S52: @IF($A52=1,$H52*($G$13<=$E52)*($G$14>=$F52),$H52*($G$13<=$F52)*($G$14>=$E52))

```
T52: @IF($A52=1,$H52*($G$14<=$E52)*($G$15>=$F52),$H52*($G$14<=$F52)*($G$15>=$E52))
U52: @IF($A52=1,$H52*($G$15<=$E52)*($G$16>=$F52),$H52*($G$15<=$F52)*($G$16>=$E52))
V52: @IF($A52=1,$H52*($G$16<=$E52)*($G$17>=$F52),$H52*($G$16<=$F52)*($G$17>=$E52))
W52: @IF($A52=1,$H52*($G$17<=$E52)*($G$18>=$F52),$H52*($G$17<=$F52)*($G$18>=$E52))
X52: @IF($A52=1,$H52*($G$18<=$E52)*($G$19>=$F52),$H52*($G$18<=$F52)*($G$19>=$E52))
Y52: @IF($A52=1,$H52*($G$19<=$E52)*($G$20>=$F52),$H52*($G$19<=$F52)*($G$20>=$E52))
Z52: @IF($A52=1,$H52*($G$20<=$E52)*($G$21>=$F52),$H52*($G$20<=$F52)*($G$21>=$E52))
AA52: @IF($A52=1,$H52*($G$21<=$E52)*($G$22>=$F52),$H52*($G$21<=$F52)*($G$22>=$E52))
AB52: @IF($A52=1,$H52*($G$22<=$E52)*($G$23>=$F52),$H52*($G$22<=$F52)*($G$23>=$E52))
AC52: @IF($A52=1,$H52*($G$23<=$E52)*($G$24>=$F52),$H52*($G$23<=$F52)*($G$24>=$E52))
AD52: @IF($A52=1,$H52*($G$24<=$E52)*($G$25>=$F52),$H52*($G$24<=$F52)*($G$25>=$E52))
AE52: @IF($A52=1,$H52*($G$25<=$E52)*($G$26>=$F52),$H52*($G$25<=$F52)*($G$26>=$E52))
AF52: @IF($A52=1,$H52*($G$26<=$E52)*($G$27>=$F52),$H52*($G$26<=$F52)*($G$27>=$E52))
AG52: @IF($A52=1,$H52*($G$27<=$E52)*($G$28>=$F52),$H52*($G$27<=$F52)*($G$28>=$E52))
AH52: @IF($A52=1,$H52*($G$28<=$E52)*($G$29>=$F52),$H52*($G$28<=$F52)*($G$29>=$E52))
AI52: @IF($A52=1,$H52*($G$29<=$E52)*($G$30>=$F52),$H52*($G$29<=$F52)*($G$30>=$E52))
AJ52: @IF($A52=1,$H52*($G$30<=$E52)*($G$31>=$F52),$H52*($G$30<=$F52)*($G$31>=$E52))
AK52: @IF($A52=1,$H52*($G$31<=$E52)*($G$32>=$F52),$H52*($G$31<=$F52)*($G$32>=$E52))
AL52: @IF($A52=1,$H52*($G$32<=$E52)*($G$33>=$F52),$H52*($G$32<=$F52)*($G$33>=$E52))
AM52: @IF($A52=1,$H52*($G$33<=$E52)*($G$34>=$F52),$H52*($G$33<=$F52)*($G$34>=$E52))
AN52: @IF($A52=1,$H52*($G$34<=$E52)*($G$35>=$F52),$H52*($G$34<=$F52)*($G$35>=$E52))
AO52: @IF($A52=1,$H52*($G$35<=$E52)*($G$36>=$F52),$H52*($G$35<=$F52)*($G$36>=$E52))
AP52: @IF($A52=1,$H52*($G$36<=$E52)*($G$37>=$F52),$H52*($G$36<=$F52)*($G$37>=$E52))
AQ52: @IF($A52=1,$H52*($G$37<=$E52)*($G$38>=$F52),$H52*($G$37<=$F52)*($G$38>=$E52))
AR52: @IF($A52=1,$H52*($G$38<=$E52)*($G$39>=$F52),$H52*($G$38<=$F52)*($G$39>=$E52))
AS52: @IF($A52=1,$H52*($G$39<=$E52)*($G$40>=$F52),$H52*($G$39<=$F52)*($G$40>=$E52))
AT52: @IF($A52=1,$H52*($G$40<=$E52)*($G$41>=$F52),$H52*($G$40<=$F52)*($G$41>=$E52))
AU52: @IF($A52=1,$H52*($G$41<=$E52)*($G$42>=$F52),$H52*($G$41<=$F52)*($G$42>=$E52))
AV52: @IF($A52=1,$H52*($G$42<=$E52)*($G$43>=$F52),$H52*($G$42<=$F52)*($G$43>=$E52))
AW52: @IF($A52=1,$H52*($G$43<=$E52)*($G$44>=$F52),$H52*($G$43<=$F52)*($G$44>=$E52))
AX52: @IF($A52=1,$H52*($G$44<=$E52)*($G$45>=$F52),$H52*($G$44<=$F52)*($G$45>=$E52))
AY52: @IF($A52=1,$H52*($G$45<=$E52)*($G$46>=$F52),$H52*($G$45<=$F52)*($G$46>=$E52))
AZ52: @IF($A52=1,$H52*($G$46<=$E52)*($G$47>=$F52),$H52*($G$46<=$F52)*($G$47>=$E52))
BA52: @IF($A52=1,$H52*($G$47<=$E52)*($G$48>=$F52),$H52*($G$47<=$F52)*($G$48>=$E52))
BB52: @IF($A52=1,$H52*($G$48<=$E52)*($G$49>=$F52),$H52*($G$48<=$F52)*($G$49>=$E52))
BC52: @IF($A52=1,$H52*($G$49<=$E52)*($G$50>=$F52),$H52*($G$49<=$F52)*($G$50>=$E52))
BD52: @IF($A52=1,$H52*($G$50<=$E52)*($G$51>=$F52),$H52*($G$50<=$F52)*($G$51>=$E52))
BE52: @IF($A52=1,$H52*($G$51<=$E52)*($G$52>=$F52),$H52*($G$51<=$F52)*($G$52>=$E52))
BF52: @IF($A52=1,$H52*($G$52<=$E52)*($G$53>=$F52),$H52*($G$52<=$F52)*($G$53>=$E52))
BG52: @IF($A52=1,$H52*($G$53<=$E52)*($G$54>=$F52),$H52*($G$53<=$F52)*($G$54>=$E52))
BH52: @IF($A52=1,$H52*($G$54<=$E52)*($G$55>=$F52),$H52*($G$54<=$F52)*($G$55>=$E52))
BI52: @IF($A52=1,$H52*($G$55<=$E52)*($G$56>=$F52),$H52*($G$55<=$F52)*($G$56>=$E52))
BJ52: @IF($A52=1,$H52*($G$56<=$E52)*($G$57>=$F52),$H52*($G$56<=$F52)*($G$57>=$E52))
BK52: @IF($A52=1,$H52*($G$57<=$E52)*($G$58>=$F52),$H52*($G$57<=$F52)*($G$58>=$E52))
BL52: @IF($A52=1,$H52*($G$58<=$E52)*($G$59>=$F52),$H52*($G$58<=$F52)*($G$59>=$E52))
BM52: @IF($A52=1,$H52*($G$59<=$E52)*($G$60>=$F52),$H52*($G$59<=$F52)*($G$60>=$E52))
BN52: @IF($A52=1,$H52*($G$60<=$E52)*($G$61>=$F52),$H52*($G$60<=$F52)*($G$61>=$E52))
BO52: @IF($A52=1,$H52*($G$61<=$E52)*($G$62>=$F52),$H52*($G$61<=$F52)*($G$62>=$E52))
BP52: @IF($A52=1,$H52*($G$62<=$E52)*($G$63>=$F52),$H52*($G$62<=$F52)*($G$63>=$E52))
BQ52: @IF($A52=1,$H52*($G$63<=$E52)*($G$64>=$F52),$H52*($G$63<=$F52)*($G$64>=$E52))
BR52: @IF($A52=1,$H52*($G$64<=$E52)*($G$65>=$F52),$H52*($G$64<=$F52)*($G$65>=$E52))
BS52: @IF($A52=1,$H52*($G$65<=$E52)*($G$66>=$F52),$H52*($G$65<=$F52)*($G$66>=$E52))
BT52: @IF($A52=1,$H52*($G$66<=$E52)*($G$67>=$F52),$H52*($G$66<=$F52)*($G$67>=$E52))
BU52: @IF($A52=1,$H52*($G$67<=$E52)*($G$68>=$F52),$H52*($G$67<=$F52)*($G$68>=$E52))
BV52: @IF($A52=1,$H52*($G$68<=$E52)*($G$69>=$F52),$H52*($G$68<=$F52)*($G$69>=$E52))
BW52: @IF($A52=1,$H52*($G$69<=$E52)*($G$70>=$F52),$H52*($G$69<=$F52)*($G$70>=$E52))
```

```
BX52: @IF($A52=1,$H52*($G$70<=$E52)*($G$71>=$F52),$H52*($G$70<=$F52)*($G$71>=$E52))
BY52: @IF($A52=1,$H52*($G$71<=$E52)*($G$72>=$F52),$H52*($G$71<=$F52)*($G$72>=$E52))
BZ52: @IF($A52=1,$H52*($G$72<=$E52)*($G$73>=$F52),$H52*($G$72<=$F52)*($G$73>=$E52))
P53: @IF($A53=1,$H53*($G$10<=$E53)*($G$11>=$F53),$H53*($G$10<=$F53)*($G$11>=$E53))
Q53: @IF($A53=1,$H53*($G$11<=$E53)*($G$12>=$F53),$H53*($G$11<=$F53)*($G$12>=$E53))
R53: @IF($A53=1,$H53*($G$12<=$E53)*($G$13>=$F53),$H53*($G$12<=$F53)*($G$13>=$E53))
S53: @IF($A53=1,$H53*($G$13<=$E53)*($G$14>=$F53),$H53*($G$13<=$F53)*($G$14>=$E53))
T53: @IF($A53=1,$H53*($G$14<=$E53)*($G$15>=$F53),$H53*($G$14<=$F53)*($G$15>=$E53))
U53: @IF($A53=1,$H53*($G$15<=$E53)*($G$16>=$F53),$H53*($G$15<=$F53)*($G$16>=$E53))
V53: @IF($A53=1,$H53*($G$16<=$E53)*($G$17>=$F53),$H53*($G$16<=$F53)*($G$17>=$E53))
W53: @IF($A53=1,$H53*($G$17<=$E53)*($G$18>=$F53),$H53*($G$17<=$F53)*($G$18>=$E53))
X53: @IF($A53=1,$H53*($G$18<=$E53)*($G$19>=$F53),$H53*($G$18<=$F53)*($G$19>=$E53))
Y53: @IF($A53=1,$H53*($G$19<=$E53)*($G$20>=$F53),$H53*($G$19<=$F53)*($G$20>=$E53))
Z53: @IF($A53=1,$H53*($G$20<=$E53)*($G$21>=$F53),$H53*($G$20<=$F53)*($G$21>=$E53))
AA53: @IF($A53=1,$H53*($G$21<=$E53)*($G$22>=$F53),$H53*($G$21<=$F53)*($G$22>=$E53))
AB53: @IF($A53=1,$H53*($G$22<=$E53)*($G$23>=$F53),$H53*($G$22<=$F53)*($G$23>=$E53))
AC53: @IF($A53=1,$H53*($G$23<=$E53)*($G$24>=$F53),$H53*($G$23<=$F53)*($G$24>=$E53))
AD53: @IF($A53=1,$H53*($G$24<=$E53)*($G$25>=$F53),$H53*($G$24<=$F53)*($G$25>=$E53))
AE53: @IF($A53=1,$H53*($G$25<=$E53)*($G$26>=$F53),$H53*($G$25<=$F53)*($G$26>=$E53))
AF53: @IF($A53=1,$H53*($G$26<=$E53)*($G$27>=$F53),$H53*($G$26<=$F53)*($G$27>=$E53))
AG53: @IF($A53=1,$H53*($G$27<=$E53)*($G$28>=$F53),$H53*($G$27<=$F53)*($G$28>=$E53))
AH53: @IF($A53=1,$H53*($G$28<=$E53)*($G$29>=$F53),$H53*($G$28<=$F53)*($G$29>=$E53))
AI53: @IF($A53=1,$H53*($G$29<=$E53)*($G$30>=$F53),$H53*($G$29<=$F53)*($G$30>=$E53))
AJ53: @IF($A53=1,$H53*($G$30<=$E53)*($G$31>=$F53),$H53*($G$30<=$F53)*($G$31>=$E53))
AK53: @IF($A53=1,$H53*($G$31<=$E53)*($G$32>=$F53),$H53*($G$31<=$F53)*($G$32>=$E53))
AL53: @IF($A53=1,$H53*($G$32<=$E53)*($G$33>=$F53),$H53*($G$32<=$F53)*($G$33>=$E53))
AM53: @IF($A53=1,$H53*($G$33<=$E53)*($G$34>=$F53),$H53*($G$33<=$F53)*($G$34>=$E53))
AN53: @IF($A53=1,$H53*($G$34<=$E53)*($G$35>=$F53),$H53*($G$34<=$F53)*($G$35>=$E53))
AO53: @IF($A53=1,$H53*($G$35<=$E53)*($G$36>=$F53),$H53*($G$35<=$F53)*($G$36>=$E53))
AP53: @IF($A53=1,$H53*($G$36<=$E53)*($G$37>=$F53),$H53*($G$36<=$F53)*($G$37>=$E53))
AQ53: @IF($A53=1,$H53*($G$37<=$E53)*($G$38>=$F53),$H53*($G$37<=$F53)*($G$38>=$E53))
AR53: @IF($A53=1,$H53*($G$38<=$E53)*($G$39>=$F53),$H53*($G$38<=$F53)*($G$39>=$E53))
AS53: @IF($A53=1,$H53*($G$39<=$E53)*($G$40>=$F53),$H53*($G$39<=$F53)*($G$40>=$E53))
AT53: @IF($A53=1,$H53*($G$40<=$E53)*($G$41>=$F53),$H53*($G$40<=$F53)*($G$41>=$E53))
AU53: @IF($A53=1,$H53*($G$41<=$E53)*($G$42>=$F53),$H53*($G$41<=$F53)*($G$42>=$E53))
AV53: @IF($A53=1,$H53*($G$42<=$E53)*($G$43>=$F53),$H53*($G$42<=$F53)*($G$43>=$E53))
AW53: @IF($A53=1,$H53*($G$43<=$E53)*($G$44>=$F53),$H53*($G$43<=$F53)*($G$44>=$E53))
AX53: @IF($A53=1,$H53*($G$44<=$E53)*($G$45>=$F53),$H53*($G$44<=$F53)*($G$45>=$E53))
AY53: @IF($A53=1,$H53*($G$45<=$E53)*($G$46>=$F53),$H53*($G$45<=$F53)*($G$46>=$E53))
AZ53: @IF($A53=1,$H53*($G$46<=$E53)*($G$47>=$F53),$H53*($G$46<=$F53)*($G$47>=$E53))
BA53: @IF($A53=1,$H53*($G$47<=$E53)*($G$48>=$F53),$H53*($G$47<=$F53)*($G$48>=$E53))
BB53: @IF($A53=1,$H53*($G$48<=$E53)*($G$49>=$F53),$H53*($G$48<=$F53)*($G$49>=$E53))
BC53: @IF($A53=1,$H53*($G$49<=$E53)*($G$50>=$F53),$H53*($G$49<=$F53)*($G$50>=$E53))
BD53: @IF($A53=1,$H53*($G$50<=$E53)*($G$51>=$F53),$H53*($G$50<=$F53)*($G$51>=$E53))
BE53: @IF($A53=1,$H53*($G$51<=$E53)*($G$52>=$F53),$H53*($G$51<=$F53)*($G$52>=$E53))
BF53: @IF($A53=1,$H53*($G$52<=$E53)*($G$53>=$F53),$H53*($G$52<=$F53)*($G$53>=$E53))
BG53: @IF($A53=1,$H53*($G$53<=$E53)*($G$54>=$F53),$H53*($G$53<=$F53)*($G$54>=$E53))
BH53: @IF($A53=1,$H53*($G$54<=$E53)*($G$55>=$F53),$H53*($G$54<=$F53)*($G$55>=$E53))
BI53: @IF($A53=1,$H53*($G$55<=$E53)*($G$56>=$F53),$H53*($G$55<=$F53)*($G$56>=$E53))
BJ53: @IF($A53=1,$H53*($G$56<=$E53)*($G$57>=$F53),$H53*($G$56<=$F53)*($G$57>=$E53))
BK53: @IF($A53=1,$H53*($G$57<=$E53)*($G$58>=$F53),$H53*($G$57<=$F53)*($G$58>=$E53))
BL53: @IF($A53=1,$H53*($G$58<=$E53)*($G$59>=$F53),$H53*($G$58<=$F53)*($G$59>=$E53))
BM53: @IF($A53=1,$H53*($G$59<=$E53)*($G$60>=$F53),$H53*($G$59<=$F53)*($G$60>=$E53))
BN53: @IF($A53=1,$H53*($G$60<=$E53)*($G$61>=$F53),$H53*($G$60<=$F53)*($G$61>=$E53))
BO53: @IF($A53=1,$H53*($G$61<=$E53)*($G$62>=$F53),$H53*($G$61<=$F53)*($G$62>=$E53))
BP53: @IF($A53=1,$H53*($G$62<=$E53)*($G$63>=$F53),$H53*($G$62<=$F53)*($G$63>=$E53))
```

BQ53: @IF($A53=1,$H53*($G$63<=$E53)*($G$64>=$F53),$H53*($G$63<=$F53)*($G$64>=$E53))
BR53: @IF($A53=1,$H53*($G$64<=$E53)*($G$65>=$F53),$H53*($G$64<=$F53)*($G$65>=$E53))
BS53: @IF($A53=1,$H53*($G$65<=$E53)*($G$66>=$F53),$H53*($G$65<=$F53)*($G$66>=$E53))
BT53: @IF($A53=1,$H53*($G$66<=$E53)*($G$67>=$F53),$H53*($G$66<=$F53)*($G$67>=$E53))
BU53: @IF($A53=1,$H53*($G$67<=$E53)*($G$68>=$F53),$H53*($G$67<=$F53)*($G$68>=$E53))
BV53: @IF($A53=1,$H53*($G$68<=$E53)*($G$69>=$F53),$H53*($G$68<=$F53)*($G$69>=$E53))
BW53: @IF($A53=1,$H53*($G$69<=$E53)*($G$70>=$F53),$H53*($G$69<=$F53)*($G$70>=$E53))
BX53: @IF($A53=1,$H53*($G$70<=$E53)*($G$71>=$F53),$H53*($G$70<=$F53)*($G$71>=$E53))
BY53: @IF($A53=1,$H53*($G$71<=$E53)*($G$72>=$F53),$H53*($G$71<=$F53)*($G$72>=$E53))
BZ53: @IF($A53=1,$H53*($G$72<=$E53)*($G$73>=$F53),$H53*($G$72<=$F53)*($G$73>=$E53))
P54: @IF($A54=1,$H54*($G$10<=$E54)*($G$11>=$F54),$H54*($G$10<=$F54)*($G$11>=$E54))
Q54: @IF($A54=1,$H54*($G$11<=$E54)*($G$12>=$F54),$H54*($G$11<=$F54)*($G$12>=$E54))
R54: @IF($A54=1,$H54*($G$12<=$E54)*($G$13>=$F54),$H54*($G$12<=$F54)*($G$13>=$E54))
S54: @IF($A54=1,$H54*($G$13<=$E54)*($G$14>=$F54),$H54*($G$13<=$F54)*($G$14>=$E54))
T54: @IF($A54=1,$H54*($G$14<=$E54)*($G$15>=$F54),$H54*($G$14<=$F54)*($G$15>=$E54))
U54: @IF($A54=1,$H54*($G$15<=$E54)*($G$16>=$F54),$H54*($G$15<=$F54)*($G$16>=$E54))
V54: @IF($A54=1,$H54*($G$16<=$E54)*($G$17>=$F54),$H54*($G$16<=$F54)*($G$17>=$E54))
W54: @IF($A54=1,$H54*($G$17<=$E54)*($G$18>=$F54),$H54*($G$17<=$F54)*($G$18>=$E54))
X54: @IF($A54=1,$H54*($G$18<=$E54)*($G$19>=$F54),$H54*($G$18<=$F54)*($G$19>=$E54))
Y54: @IF($A54=1,$H54*($G$19<=$E54)*($G$20>=$F54),$H54*($G$19<=$F54)*($G$20>=$E54))
Z54: @IF($A54=1,$H54*($G$20<=$E54)*($G$21>=$F54),$H54*($G$20<=$F54)*($G$21>=$E54))
AA54: @IF($A54=1,$H54*($G$21<=$E54)*($G$22>=$F54),$H54*($G$21<=$F54)*($G$22>=$E54))
AB54: @IF($A54=1,$H54*($G$22<=$E54)*($G$23>=$F54),$H54*($G$22<=$F54)*($G$23>=$E54))
AC54: @IF($A54=1,$H54*($G$23<=$E54)*($G$24>=$F54),$H54*($G$23<=$F54)*($G$24>=$E54))
AD54: @IF($A54=1,$H54*($G$24<=$E54)*($G$25>=$F54),$H54*($G$24<=$F54)*($G$25>=$E54))
AE54: @IF($A54=1,$H54*($G$25<=$E54)*($G$26>=$F54),$H54*($G$25<=$F54)*($G$26>=$E54))
AF54: @IF($A54=1,$H54*($G$26<=$E54)*($G$27>=$F54),$H54*($G$26<=$F54)*($G$27>=$E54))
AG54: @IF($A54=1,$H54*($G$27<=$E54)*($G$28>=$F54),$H54*($G$27<=$F54)*($G$28>=$E54))
AH54: @IF($A54=1,$H54*($G$28<=$E54)*($G$29>=$F54),$H54*($G$28<=$F54)*($G$29>=$E54))
AI54: @IF($A54=1,$H54*($G$29<=$E54)*($G$30>=$F54),$H54*($G$29<=$F54)*($G$30>=$E54))
AJ54: @IF($A54=1,$H54*($G$30<=$E54)*($G$31>=$F54),$H54*($G$30<=$F54)*($G$31>=$E54))
AK54: @IF($A54=1,$H54*($G$31<=$E54)*($G$32>=$F54),$H54*($G$31<=$F54)*($G$32>=$E54))
AL54: @IF($A54=1,$H54*($G$32<=$E54)*($G$33>=$F54),$H54*($G$32<=$F54)*($G$33>=$E54))
AM54: @IF($A54=1,$H54*($G$33<=$E54)*($G$34>=$F54),$H54*($G$33<=$F54)*($G$34>=$E54))
AN54: @IF($A54=1,$H54*($G$34<=$E54)*($G$35>=$F54),$H54*($G$34<=$F54)*($G$35>=$E54))
AO54: @IF($A54=1,$H54*($G$35<=$E54)*($G$36>=$F54),$H54*($G$35<=$F54)*($G$36>=$E54))
AP54: @IF($A54=1,$H54*($G$36<=$E54)*($G$37>=$F54),$H54*($G$36<=$F54)*($G$37>=$E54))
AQ54: @IF($A54=1,$H54*($G$37<=$E54)*($G$38>=$F54),$H54*($G$37<=$F54)*($G$38>=$E54))
AR54: @IF($A54=1,$H54*($G$38<=$E54)*($G$39>=$F54),$H54*($G$38<=$F54)*($G$39>=$E54))
AS54: @IF($A54=1,$H54*($G$39<=$E54)*($G$40>=$F54),$H54*($G$39<=$F54)*($G$40>=$E54))
AT54: @IF($A54=1,$H54*($G$40<=$E54)*($G$41>=$F54),$H54*($G$40<=$F54)*($G$41>=$E54))
AU54: @IF($A54=1,$H54*($G$41<=$E54)*($G$42>=$F54),$H54*($G$41<=$F54)*($G$42>=$E54))
AV54: @IF($A54=1,$H54*($G$42<=$E54)*($G$43>=$F54),$H54*($G$42<=$F54)*($G$43>=$E54))
AW54: @IF($A54=1,$H54*($G$43<=$E54)*($G$44>=$F54),$H54*($G$43<=$F54)*($G$44>=$E54))
AX54: @IF($A54=1,$H54*($G$44<=$E54)*($G$45>=$F54),$H54*($G$44<=$F54)*($G$45>=$E54))
AY54: @IF($A54=1,$H54*($G$45<=$E54)*($G$46>=$F54),$H54*($G$45<=$F54)*($G$46>=$E54))
AZ54: @IF($A54=1,$H54*($G$46<=$E54)*($G$47>=$F54),$H54*($G$46<=$F54)*($G$47>=$E54))
BA54: @IF($A54=1,$H54*($G$47<=$E54)*($G$48>=$F54),$H54*($G$47<=$F54)*($G$48>=$E54))
BB54: @IF($A54=1,$H54*($G$48<=$E54)*($G$49>=$F54),$H54*($G$48<=$F54)*($G$49>=$E54))
BC54: @IF($A54=1,$H54*($G$49<=$E54)*($G$50>=$F54),$H54*($G$49<=$F54)*($G$50>=$E54))
BD54: @IF($A54=1,$H54*($G$50<=$E54)*($G$51>=$F54),$H54*($G$50<=$F54)*($G$51>=$E54))
BE54: @IF($A54=1,$H54*($G$51<=$E54)*($G$52>=$F54),$H54*($G$51<=$F54)*($G$52>=$E54))
BF54: @IF($A54=1,$H54*($G$52<=$E54)*($G$53>=$F54),$H54*($G$52<=$F54)*($G$53>=$E54))
BG54: @IF($A54=1,$H54*($G$53<=$E54)*($G$54>=$F54),$H54*($G$53<=$F54)*($G$54>=$E54))
BH54: @IF($A54=1,$H54*($G$54<=$E54)*($G$55>=$F54),$H54*($G$54<=$F54)*($G$55>=$E54))
BI54: @IF($A54=1,$H54*($G$55<=$E54)*($G$56>=$F54),$H54*($G$55<=$F54)*($G$56>=$E54))

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BJ54: @IF($A54=1,$H54*($G$56<=$E54)*($G$57>=$F54),$H54*($G$56<=$F54)*($G$57>=$E54))
BK54: @IF($A54=1,$H54*($G$57<=$E54)*($G$58>=$F54),$H54*($G$57<=$F54)*($G$58>=$E54))
BL54: @IF($A54=1,$H54*($G$58<=$E54)*($G$59>=$F54),$H54*($G$58<=$F54)*($G$59>=$E54))
BM54: @IF($A54=1,$H54*($G$59<=$E54)*($G$60>=$F54),$H54*($G$59<=$F54)*($G$60>=$E54))
BN54: @IF($A54=1,$H54*($G$60<=$E54)*($G$61>=$F54),$H54*($G$60<=$F54)*($G$61>=$E54))
BO54: @IF($A54=1,$H54*($G$61<=$E54)*($G$62>=$F54),$H54*($G$61<=$F54)*($G$62>=$E54))
BP54: @IF($A54=1,$H54*($G$62<=$E54)*($G$63>=$F54),$H54*($G$62<=$F54)*($G$63>=$E54))
BQ54: @IF($A54=1,$H54*($G$63<=$E54)*($G$64>=$F54),$H54*($G$63<=$F54)*($G$64>=$E54))
BR54: @IF($A54=1,$H54*($G$64<=$E54)*($G$65>=$F54),$H54*($G$64<=$F54)*($G$65>=$E54))
BS54: @IF($A54=1,$H54*($G$65<=$E54)*($G$66>=$F54),$H54*($G$65<=$F54)*($G$66>=$E54))
BT54: @IF($A54=1,$H54*($G$66<=$E54)*($G$67>=$F54),$H54*($G$66<=$F54)*($G$67>=$E54))
BU54: @IF($A54=1,$H54*($G$67<=$E54)*($G$68>=$F54),$H54*($G$67<=$F54)*($G$68>=$E54))
BV54: @IF($A54=1,$H54*($G$68<=$E54)*($G$69>=$F54),$H54*($G$68<=$F54)*($G$69>=$E54))
BW54: @IF($A54=1,$H54*($G$69<=$E54)*($G$70>=$F54),$H54*($G$69<=$F54)*($G$70>=$E54))
BX54: @IF($A54=1,$H54*($G$70<=$E54)*($G$71>=$F54),$H54*($G$70<=$F54)*($G$71>=$E54))
BY54: @IF($A54=1,$H54*($G$71<=$E54)*($G$72>=$F54),$H54*($G$71<=$F54)*($G$72>=$E54))
BZ54: @IF($A54=1,$H54*($G$72<=$E54)*($G$73>=$F54),$H54*($G$72<=$F54)*($G$73>=$E54))
P55: @IF($A55=1,$H55*($G$10<=$E55)*($G$11>=$F55),$H55*($G$10<=$F55)*($G$11>=$E55))
Q55: @IF($A55=1,$H55*($G$11<=$E55)*($G$12>=$F55),$H55*($G$11<=$F55)*($G$12>=$E55))
R55: @IF($A55=1,$H55*($G$12<=$E55)*($G$13>=$F55),$H55*($G$12<=$F55)*($G$13>=$E55))
S55: @IF($A55=1,$H55*($G$13<=$E55)*($G$14>=$F55),$H55*($G$13<=$F55)*($G$14>=$E55))
T55: @IF($A55=1,$H55*($G$14<=$E55)*($G$15>=$F55),$H55*($G$14<=$F55)*($G$15>=$E55))
U55: @IF($A55=1,$H55*($G$15<=$E55)*($G$16>=$F55),$H55*($G$15<=$F55)*($G$16>=$E55))
V55: @IF($A55=1,$H55*($G$16<=$E55)*($G$17>=$F55),$H55*($G$16<=$F55)*($G$17>=$E55))
W55: @IF($A55=1,$H55*($G$17<=$E55)*($G$18>=$F55),$H55*($G$17<=$F55)*($G$18>=$E55))
X55: @IF($A55=1,$H55*($G$18<=$E55)*($G$19>=$F55),$H55*($G$18<=$F55)*($G$19>=$E55))
Y55: @IF($A55=1,$H55*($G$19<=$E55)*($G$20>=$F55),$H55*($G$19<=$F55)*($G$20>=$E55))
Z55: @IF($A55=1,$H55*($G$20<=$E55)*($G$21>=$F55),$H55*($G$20<=$F55)*($G$21>=$E55))
AA55: @IF($A55=1,$H55*($G$21<=$E55)*($G$22>=$F55),$H55*($G$21<=$F55)*($G$22>=$E55))
AB55: @IF($A55=1,$H55*($G$22<=$E55)*($G$23>=$F55),$H55*($G$22<=$F55)*($G$23>=$E55))
AC55: @IF($A55=1,$H55*($G$23<=$E55)*($G$24>=$F55),$H55*($G$23<=$F55)*($G$24>=$E55))
AD55: @IF($A55=1,$H55*($G$24<=$E55)*($G$25>=$F55),$H55*($G$24<=$F55)*($G$25>=$E55))
AE55: @IF($A55=1,$H55*($G$25<=$E55)*($G$26>=$F55),$H55*($G$25<=$F55)*($G$26>=$E55))
AF55: @IF($A55=1,$H55*($G$26<=$E55)*($G$27>=$F55),$H55*($G$26<=$F55)*($G$27>=$E55))
AG55: @IF($A55=1,$H55*($G$27<=$E55)*($G$28>=$F55),$H55*($G$27<=$F55)*($G$28>=$E55))
AH55: @IF($A55=1,$H55*($G$28<=$E55)*($G$29>=$F55),$H55*($G$28<=$F55)*($G$29>=$E55))
AI55: @IF($A55=1,$H55*($G$29<=$E55)*($G$30>=$F55),$H55*($G$29<=$F55)*($G$30>=$E55))
AJ55: @IF($A55=1,$H55*($G$30<=$E55)*($G$31>=$F55),$H55*($G$30<=$F55)*($G$31>=$E55))
AK55: @IF($A55=1,$H55*($G$31<=$E55)*($G$32>=$F55),$H55*($G$31<=$F55)*($G$32>=$E55))
AL55: @IF($A55=1,$H55*($G$32<=$E55)*($G$33>=$F55),$H55*($G$32<=$F55)*($G$33>=$E55))
AM55: @IF($A55=1,$H55*($G$33<=$E55)*($G$34>=$F55),$H55*($G$33<=$F55)*($G$34>=$E55))
AN55: @IF($A55=1,$H55*($G$34<=$E55)*($G$35>=$F55),$H55*($G$34<=$F55)*($G$35>=$E55))
AO55: @IF($A55=1,$H55*($G$35<=$E55)*($G$36>=$F55),$H55*($G$35<=$F55)*($G$36>=$E55))
AP55: @IF($A55=1,$H55*($G$36<=$E55)*($G$37>=$F55),$H55*($G$36<=$F55)*($G$37>=$E55))
AQ55: @IF($A55=1,$H55*($G$37<=$E55)*($G$38>=$F55),$H55*($G$37<=$F55)*($G$38>=$E55))
AR55: @IF($A55=1,$H55*($G$38<=$E55)*($G$39>=$F55),$H55*($G$38<=$F55)*($G$39>=$E55))
AS55: @IF($A55=1,$H55*($G$39<=$E55)*($G$40>=$F55),$H55*($G$39<=$F55)*($G$40>=$E55))
AT55: @IF($A55=1,$H55*($G$40<=$E55)*($G$41>=$F55),$H55*($G$40<=$F55)*($G$41>=$E55))
AU55: @IF($A55=1,$H55*($G$41<=$E55)*($G$42>=$F55),$H55*($G$41<=$F55)*($G$42>=$E55))
AV55: @IF($A55=1,$H55*($G$42<=$E55)*($G$43>=$F55),$H55*($G$42<=$F55)*($G$43>=$E55))
AW55: @IF($A55=1,$H55*($G$43<=$E55)*($G$44>=$F55),$H55*($G$43<=$F55)*($G$44>=$E55))
AX55: @IF($A55=1,$H55*($G$44<=$E55)*($G$45>=$F55),$H55*($G$44<=$F55)*($G$45>=$E55))
AY55: @IF($A55=1,$H55*($G$45<=$E55)*($G$46>=$F55),$H55*($G$45<=$F55)*($G$46>=$E55))
AZ55: @IF($A55=1,$H55*($G$46<=$E55)*($G$47>=$F55),$H55*($G$46<=$F55)*($G$47>=$E55))
BA55: @IF($A55=1,$H55*($G$47<=$E55)*($G$48>=$F55),$H55*($G$47<=$F55)*($G$48>=$E55))
BB55: @IF($A55=1,$H55*($G$48<=$E55)*($G$49>=$F55),$H55*($G$48<=$F55)*($G$49>=$E55))
```

```
BC55: @IF($A55=1,$H55*($G$49<=$E55)*($G$50>=$F55),$H55*($G$49<=$F55)*($G$50>=$E55))
BD55: @IF($A55=1,$H55*($G$50<=$E55)*($G$51>=$F55),$H55*($G$50<=$F55)*($G$51>=$E55))
BE55: @IF($A55=1,$H55*($G$51<=$E55)*($G$52>=$F55),$H55*($G$51<=$F55)*($G$52>=$E55))
BF55: @IF($A55=1,$H55*($G$52<=$E55)*($G$53>=$F55),$H55*($G$52<=$F55)*($G$53>=$E55))
BG55: @IF($A55=1,$H55*($G$53<=$E55)*($G$54>=$F55),$H55*($G$53<=$F55)*($G$54>=$E55))
BH55: @IF($A55=1,$H55*($G$54<=$E55)*($G$55>=$F55),$H55*($G$54<=$F55)*($G$55>=$E55))
BI55: @IF($A55=1,$H55*($G$55<=$E55)*($G$56>=$F55),$H55*($G$55<=$F55)*($G$56>=$E55))
BJ55: @IF($A55=1,$H55*($G$56<=$E55)*($G$57>=$F55),$H55*($G$56<=$F55)*($G$57>=$E55))
BK55: @IF($A55=1,$H55*($G$57<=$E55)*($G$58>=$F55),$H55*($G$57<=$F55)*($G$58>=$E55))
BL55: @IF($A55=1,$H55*($G$58<=$E55)*($G$59>=$F55),$H55*($G$58<=$F55)*($G$59>=$E55))
BM55: @IF($A55=1,$H55*($G$59<=$E55)*($G$60>=$F55),$H55*($G$59<=$F55)*($G$60>=$E55))
BN55: @IF($A55=1,$H55*($G$60<=$E55)*($G$61>=$F55),$H55*($G$60<=$F55)*($G$61>=$E55))
BO55: @IF($A55=1,$H55*($G$61<=$E55)*($G$62>=$F55),$H55*($G$61<=$F55)*($G$62>=$E55))
BP55: @IF($A55=1,$H55*($G$62<=$E55)*($G$63>=$F55),$H55*($G$62<=$F55)*($G$63>=$E55))
BQ55: @IF($A55=1,$H55*($G$63<=$E55)*($G$64>=$F55),$H55*($G$63<=$F55)*($G$64>=$E55))
BR55: @IF($A55=1,$H55*($G$64<=$E55)*($G$65>=$F55),$H55*($G$64<=$F55)*($G$65>=$E55))
BS55: @IF($A55=1,$H55*($G$65<=$E55)*($G$66>=$F55),$H55*($G$65<=$F55)*($G$66>=$E55))
BT55: @IF($A55=1,$H55*($G$66<=$E55)*($G$67>=$F55),$H55*($G$66<=$F55)*($G$67>=$E55))
BU55: @IF($A55=1,$H55*($G$67<=$E55)*($G$68>=$F55),$H55*($G$67<=$F55)*($G$68>=$E55))
BV55: @IF($A55=1,$H55*($G$68<=$E55)*($G$69>=$F55),$H55*($G$68<=$F55)*($G$69>=$E55))
BW55: @IF($A55=1,$H55*($G$69<=$E55)*($G$70>=$F55),$H55*($G$69<=$F55)*($G$70>=$E55))
BX55: @IF($A55=1,$H55*($G$70<=$E55)*($G$71>=$F55),$H55*($G$70<=$F55)*($G$71>=$E55))
BY55: @IF($A55=1,$H55*($G$71<=$E55)*($G$72>=$F55),$H55*($G$71<=$F55)*($G$72>=$E55))
BZ55: @IF($A55=1,$H55*($G$72<=$E55)*($G$73>=$F55),$H55*($G$72<=$F55)*($G$73>=$E55))
P56: @IF($A56=1,$H56*($G$10<=$E56)*($G$11>=$F56),$H56*($G$10<=$F56)*($G$11>=$E56))
Q56: @IF($A56=1,$H56*($G$11<=$E56)*($G$12>=$F56),$H56*($G$11<=$F56)*($G$12>=$E56))
R56: @IF($A56=1,$H56*($G$12<=$E56)*($G$13>=$F56),$H56*($G$12<=$F56)*($G$13>=$E56))
S56: @IF($A56=1,$H56*($G$13<=$E56)*($G$14>=$F56),$H56*($G$13<=$F56)*($G$14>=$E56))
T56: @IF($A56=1,$H56*($G$14<=$E56)*($G$15>=$F56),$H56*($G$14<=$F56)*($G$15>=$E56))
U56: @IF($A56=1,$H56*($G$15<=$E56)*($G$16>=$F56),$H56*($G$15<=$F56)*($G$16>=$E56))
V56: @IF($A56=1,$H56*($G$16<=$E56)*($G$17>=$F56),$H56*($G$16<=$F56)*($G$17>=$E56))
W56: @IF($A56=1,$H56*($G$17<=$E56)*($G$18>=$F56),$H56*($G$17<=$F56)*($G$18>=$E56))
X56: @IF($A56=1,$H56*($G$18<=$E56)*($G$19>=$F56),$H56*($G$18<=$F56)*($G$19>=$E56))
Y56: @IF($A56=1,$H56*($G$19<=$E56)*($G$20>=$F56),$H56*($G$19<=$F56)*($G$20>=$E56))
Z56: @IF($A56=1,$H56*($G$20<=$E56)*($G$21>=$F56),$H56*($G$20<=$F56)*($G$21>=$E56))
AA56: @IF($A56=1,$H56*($G$21<=$E56)*($G$22>=$F56),$H56*($G$21<=$F56)*($G$22>=$E56))
AB56: @IF($A56=1,$H56*($G$22<=$E56)*($G$23>=$F56),$H56*($G$22<=$F56)*($G$23>=$E56))
AC56: @IF($A56=1,$H56*($G$23<=$E56)*($G$24>=$F56),$H56*($G$23<=$F56)*($G$24>=$E56))
AD56: @IF($A56=1,$H56*($G$24<=$E56)*($G$25>=$F56),$H56*($G$24<=$F56)*($G$25>=$E56))
AE56: @IF($A56=1,$H56*($G$25<=$E56)*($G$26>=$F56),$H56*($G$25<=$F56)*($G$26>=$E56))
AF56: @IF($A56=1,$H56*($G$26<=$E56)*($G$27>=$F56),$H56*($G$26<=$F56)*($G$27>=$E56))
AG56: @IF($A56=1,$H56*($G$27<=$E56)*($G$28>=$F56),$H56*($G$27<=$F56)*($G$28>=$E56))
AH56: @IF($A56=1,$H56*($G$28<=$E56)*($G$29>=$F56),$H56*($G$28<=$F56)*($G$29>=$E56))
AI56: @IF($A56=1,$H56*($G$29<=$E56)*($G$30>=$F56),$H56*($G$29<=$F56)*($G$30>=$E56))
AJ56: @IF($A56=1,$H56*($G$30<=$E56)*($G$31>=$F56),$H56*($G$30<=$F56)*($G$31>=$E56))
AK56: @IF($A56=1,$H56*($G$31<=$E56)*($G$32>=$F56),$H56*($G$31<=$F56)*($G$32>=$E56))
AL56: @IF($A56=1,$H56*($G$32<=$E56)*($G$33>=$F56),$H56*($G$32<=$F56)*($G$33>=$E56))
AM56: @IF($A56=1,$H56*($G$33<=$E56)*($G$34>=$F56),$H56*($G$33<=$F56)*($G$34>=$E56))
AN56: @IF($A56=1,$H56*($G$34<=$E56)*($G$35>=$F56),$H56*($G$34<=$F56)*($G$35>=$E56))
AO56: @IF($A56=1,$H56*($G$35<=$E56)*($G$36>=$F56),$H56*($G$35<=$F56)*($G$36>=$E56))
AP56: @IF($A56=1,$H56*($G$36<=$E56)*($G$37>=$F56),$H56*($G$36<=$F56)*($G$37>=$E56))
AQ56: @IF($A56=1,$H56*($G$37<=$E56)*($G$38>=$F56),$H56*($G$37<=$F56)*($G$38>=$E56))
AR56: @IF($A56=1,$H56*($G$38<=$E56)*($G$39>=$F56),$H56*($G$38<=$F56)*($G$39>=$E56))
AS56: @IF($A56=1,$H56*($G$39<=$E56)*($G$40>=$F56),$H56*($G$39<=$F56)*($G$40>=$E56))
AT56: @IF($A56=1,$H56*($G$40<=$E56)*($G$41>=$F56),$H56*($G$40<=$F56)*($G$41>=$E56))
AU56: @IF($A56=1,$H56*($G$41<=$E56)*($G$42>=$F56),$H56*($G$41<=$F56)*($G$42>=$E56))
```

```
AV56: @IF($A56=1,$H56*($G$42<=$E56)*($G$43>=$F56),$H56*($G$42<=$F56)*($G$43>=$E56))
AW56: @IF($A56=1,$H56*($G$43<=$E56)*($G$44>=$F56),$H56*($G$43<=$F56)*($G$44>=$E56))
AX56: @IF($A56=1,$H56*($G$44<=$E56)*($G$45>=$F56),$H56*($G$44<=$F56)*($G$45>=$E56))
AY56: @IF($A56=1,$H56*($G$45<=$E56)*($G$46>=$F56),$H56*($G$45<=$F56)*($G$46>=$E56))
AZ56: @IF($A56=1,$H56*($G$46<=$E56)*($G$47>=$F56),$H56*($G$46<=$F56)*($G$47>=$E56))
BA56: @IF($A56=1,$H56*($G$47<=$E56)*($G$48>=$F56),$H56*($G$47<=$F56)*($G$48>=$E56))
BB56: @IF($A56=1,$H56*($G$48<=$E56)*($G$49>=$F56),$H56*($G$48<=$F56)*($G$49>=$E56))
BC56: @IF($A56=1,$H56*($G$49<=$E56)*($G$50>=$F56),$H56*($G$49<=$F56)*($G$50>=$E56))
BD56: @IF($A56=1,$H56*($G$50<=$E56)*($G$51>=$F56),$H56*($G$50<=$F56)*($G$51>=$E56))
BE56: @IF($A56=1,$H56*($G$51<=$E56)*($G$52>=$F56),$H56*($G$51<=$F56)*($G$52>=$E56))
BF56: @IF($A56=1,$H56*($G$52<=$E56)*($G$53>=$F56),$H56*($G$52<=$F56)*($G$53>=$E56))
BG56: @IF($A56=1,$H56*($G$53<=$E56)*($G$54>=$F56),$H56*($G$53<=$F56)*($G$54>=$E56))
BH56: @IF($A56=1,$H56*($G$54<=$E56)*($G$55>=$F56),$H56*($G$54<=$F56)*($G$55>=$E56))
BI56: @IF($A56=1,$H56*($G$55<=$E56)*($G$56>=$F56),$H56*($G$55<=$F56)*($G$56>=$E56))
BJ56: @IF($A56=1,$H56*($G$56<=$E56)*($G$57>=$F56),$H56*($G$56<=$F56)*($G$57>=$E56))
BK56: @IF($A56=1,$H56*($G$57<=$E56)*($G$58>=$F56),$H56*($G$57<=$F56)*($G$58>=$E56))
BL56: @IF($A56=1,$H56*($G$58<=$E56)*($G$59>=$F56),$H56*($G$58<=$F56)*($G$59>=$E56))
BM56: @IF($A56=1,$H56*($G$59<=$E56)*($G$60>=$F56),$H56*($G$59<=$F56)*($G$60>=$E56))
BN56: @IF($A56=1,$H56*($G$60<=$E56)*($G$61>=$F56),$H56*($G$60<=$F56)*($G$61>=$E56))
BO56: @IF($A56=1,$H56*($G$61<=$E56)*($G$62>=$F56),$H56*($G$61<=$F56)*($G$62>=$E56))
BP56: @IF($A56=1,$H56*($G$62<=$E56)*($G$63>=$F56),$H56*($G$62<=$F56)*($G$63>=$E56))
BQ56: @IF($A56=1,$H56*($G$63<=$E56)*($G$64>=$F56),$H56*($G$63<=$F56)*($G$64>=$E56))
BR56: @IF($A56=1,$H56*($G$64<=$E56)*($G$65>=$F56),$H56*($G$64<=$F56)*($G$65>=$E56))
BS56: @IF($A56=1,$H56*($G$65<=$E56)*($G$66>=$F56),$H56*($G$65<=$F56)*($G$66>=$E56))
BT56: @IF($A56=1,$H56*($G$66<=$E56)*($G$67>=$F56),$H56*($G$66<=$F56)*($G$67>=$E56))
BU56: @IF($A56=1,$H56*($G$67<=$E56)*($G$68>=$F56),$H56*($G$67<=$F56)*($G$68>=$E56))
BV56: @IF($A56=1,$H56*($G$68<=$E56)*($G$69>=$F56),$H56*($G$68<=$F56)*($G$69>=$E56))
BW56: @IF($A56=1,$H56*($G$69<=$E56)*($G$70>=$F56),$H56*($G$69<=$F56)*($G$70>=$E56))
BX56: @IF($A56=1,$H56*($G$70<=$E56)*($G$71>=$F56),$H56*($G$70<=$F56)*($G$71>=$E56))
BY56: @IF($A56=1,$H56*($G$71<=$E56)*($G$72>=$F56),$H56*($G$71<=$F56)*($G$72>=$E56))
BZ56: @IF($A56=1,$H56*($G$72<=$E56)*($G$73>=$F56),$H56*($G$72<=$F56)*($G$73>=$E56))
P57: @IF($A57=1,$H57*($G$10<=$E57)*($G$11>=$F57),$H57*($G$10<=$F57)*($G$11>=$E57))
Q57: @IF($A57=1,$H57*($G$11<=$E57)*($G$12>=$F57),$H57*($G$11<=$F57)*($G$12>=$E57))
R57: @IF($A57=1,$H57*($G$12<=$E57)*($G$13>=$F57),$H57*($G$12<=$F57)*($G$13>=$E57))
S57: @IF($A57=1,$H57*($G$13<=$E57)*($G$14>=$F57),$H57*($G$13<=$F57)*($G$14>=$E57))
T57: @IF($A57=1,$H57*($G$14<=$E57)*($G$15>=$F57),$H57*($G$14<=$F57)*($G$15>=$E57))
U57: @IF($A57=1,$H57*($G$15<=$E57)*($G$16>=$F57),$H57*($G$15<=$F57)*($G$16>=$E57))
V57: @IF($A57=1,$H57*($G$16<=$E57)*($G$17>=$F57),$H57*($G$16<=$F57)*($G$17>=$E57))
W57: @IF($A57=1,$H57*($G$17<=$E57)*($G$18>=$F57),$H57*($G$17<=$F57)*($G$18>=$E57))
X57: @IF($A57=1,$H57*($G$18<=$E57)*($G$19>=$F57),$H57*($G$18<=$F57)*($G$19>=$E57))
Y57: @IF($A57=1,$H57*($G$19<=$E57)*($G$20>=$F57),$H57*($G$19<=$F57)*($G$20>=$E57))
Z57: @IF($A57=1,$H57*($G$20<=$E57)*($G$21>=$F57),$H57*($G$20<=$F57)*($G$21>=$E57))
AA57: @IF($A57=1,$H57*($G$21<=$E57)*($G$22>=$F57),$H57*($G$21<=$F57)*($G$22>=$E57))
AB57: @IF($A57=1,$H57*($G$22<=$E57)*($G$23>=$F57),$H57*($G$22<=$F57)*($G$23>=$E57))
AC57: @IF($A57=1,$H57*($G$23<=$E57)*($G$24>=$F57),$H57*($G$23<=$F57)*($G$24>=$E57))
AD57: @IF($A57=1,$H57*($G$24<=$E57)*($G$25>=$F57),$H57*($G$24<=$F57)*($G$25>=$E57))
AE57: @IF($A57=1,$H57*($G$25<=$E57)*($G$26>=$F57),$H57*($G$25<=$F57)*($G$26>=$E57))
AF57: @IF($A57=1,$H57*($G$26<=$E57)*($G$27>=$F57),$H57*($G$26<=$F57)*($G$27>=$E57))
AG57: @IF($A57=1,$H57*($G$27<=$E57)*($G$28>=$F57),$H57*($G$27<=$F57)*($G$28>=$E57))
AH57: @IF($A57=1,$H57*($G$28<=$E57)*($G$29>=$F57),$H57*($G$28<=$F57)*($G$29>=$E57))
AI57: @IF($A57=1,$H57*($G$29<=$E57)*($G$30>=$F57),$H57*($G$29<=$F57)*($G$30>=$E57))
AJ57: @IF($A57=1,$H57*($G$30<=$E57)*($G$31>=$F57),$H57*($G$30<=$F57)*($G$31>=$E57))
AK57: @IF($A57=1,$H57*($G$31<=$E57)*($G$32>=$F57),$H57*($G$31<=$F57)*($G$32>=$E57))
AL57: @IF($A57=1,$H57*($G$32<=$E57)*($G$33>=$F57),$H57*($G$32<=$F57)*($G$33>=$E57))
AM57: @IF($A57=1,$H57*($G$33<=$E57)*($G$34>=$F57),$H57*($G$33<=$F57)*($G$34>=$E57))
AN57: @IF($A57=1,$H57*($G$34<=$E57)*($G$35>=$F57),$H57*($G$34<=$F57)*($G$35>=$E57))
```

```
AO57: @IF($A57=1,$H57*($G$35<=$E57)*($G$36>=$F57),$H57*($G$35<=$F57)*($G$36>=$E57))
AP57: @IF($A57=1,$H57*($G$36<=$E57)*($G$37>=$F57),$H57*($G$36<=$F57)*($G$37>=$E57))
AQ57: @IF($A57=1,$H57*($G$37<=$E57)*($G$38>=$F57),$H57*($G$37<=$F57)*($G$38>=$E57))
AR57: @IF($A57=1,$H57*($G$38<=$E57)*($G$39>=$F57),$H57*($G$38<=$F57)*($G$39>=$E57))
AS57: @IF($A57=1,$H57*($G$39<=$E57)*($G$40>=$F57),$H57*($G$39<=$F57)*($G$40>=$E57))
AT57: @IF($A57=1,$H57*($G$40<=$E57)*($G$41>=$F57),$H57*($G$40<=$F57)*($G$41>=$E57))
AU57: @IF($A57=1,$H57*($G$41<=$E57)*($G$42>=$F57),$H57*($G$41<=$F57)*($G$42>=$E57))
AV57: @IF($A57=1,$H57*($G$42<=$E57)*($G$43>=$F57),$H57*($G$42<=$F57)*($G$43>=$E57))
AW57: @IF($A57=1,$H57*($G$43<=$E57)*($G$44>=$F57),$H57*($G$43<=$F57)*($G$44>=$E57))
AX57: @IF($A57=1,$H57*($G$44<=$E57)*($G$45>=$F57),$H57*($G$44<=$F57)*($G$45>=$E57))
AY57: @IF($A57=1,$H57*($G$45<=$E57)*($G$46>=$F57),$H57*($G$45<=$F57)*($G$46>=$E57))
AZ57: @IF($A57=1,$H57*($G$46<=$E57)*($G$47>=$F57),$H57*($G$46<=$F57)*($G$47>=$E57))
BA57: @IF($A57=1,$H57*($G$47<=$E57)*($G$48>=$F57),$H57*($G$47<=$F57)*($G$48>=$E57))
BB57: @IF($A57=1,$H57*($G$48<=$E57)*($G$49>=$F57),$H57*($G$48<=$F57)*($G$49>=$E57))
BC57: @IF($A57=1,$H57*($G$49<=$E57)*($G$50>=$F57),$H57*($G$49<=$F57)*($G$50>=$E57))
BD57: @IF($A57=1,$H57*($G$50<=$E57)*($G$51>=$F57),$H57*($G$50<=$F57)*($G$51>=$E57))
BE57: @IF($A57=1,$H57*($G$51<=$E57)*($G$52>=$F57),$H57*($G$51<=$F57)*($G$52>=$E57))
BF57: @IF($A57=1,$H57*($G$52<=$E57)*($G$53>=$F57),$H57*($G$52<=$F57)*($G$53>=$E57))
BG57: @IF($A57=1,$H57*($G$53<=$E57)*($G$54>=$F57),$H57*($G$53<=$F57)*($G$54>=$E57))
BH57: @IF($A57=1,$H57*($G$54<=$E57)*($G$55>=$F57),$H57*($G$54<=$F57)*($G$55>=$E57))
BI57: @IF($A57=1,$H57*($G$55<=$E57)*($G$56>=$F57),$H57*($G$55<=$F57)*($G$56>=$E57))
BJ57: @IF($A57=1,$H57*($G$56<=$E57)*($G$57>=$F57),$H57*($G$56<=$F57)*($G$57>=$E57))
BK57: @IF($A57=1,$H57*($G$57<=$E57)*($G$58>=$F57),$H57*($G$57<=$F57)*($G$58>=$E57))
BL57: @IF($A57=1,$H57*($G$58<=$E57)*($G$59>=$F57),$H57*($G$58<=$F57)*($G$59>=$E57))
BM57: @IF($A57=1,$H57*($G$59<=$E57)*($G$60>=$F57),$H57*($G$59<=$F57)*($G$60>=$E57))
BN57: @IF($A57=1,$H57*($G$60<=$E57)*($G$61>=$F57),$H57*($G$60<=$F57)*($G$61>=$E57))
BO57: @IF($A57=1,$H57*($G$61<=$E57)*($G$62>=$F57),$H57*($G$61<=$F57)*($G$62>=$E57))
BP57: @IF($A57=1,$H57*($G$62<=$E57)*($G$63>=$F57),$H57*($G$62<=$F57)*($G$63>=$E57))
BQ57: @IF($A57=1,$H57*($G$63<=$E57)*($G$64>=$F57),$H57*($G$63<=$F57)*($G$64>=$E57))
BR57: @IF($A57=1,$H57*($G$64<=$E57)*($G$65>=$F57),$H57*($G$64<=$F57)*($G$65>=$E57))
BS57: @IF($A57=1,$H57*($G$65<=$E57)*($G$66>=$F57),$H57*($G$65<=$F57)*($G$66>=$E57))
BT57: @IF($A57=1,$H57*($G$66<=$E57)*($G$67>=$F57),$H57*($G$66<=$F57)*($G$67>=$E57))
BU57: @IF($A57=1,$H57*($G$67<=$E57)*($G$68>=$F57),$H57*($G$67<=$F57)*($G$68>=$E57))
BV57: @IF($A57=1,$H57*($G$68<=$E57)*($G$69>=$F57),$H57*($G$68<=$F57)*($G$69>=$E57))
BW57: @IF($A57=1,$H57*($G$69<=$E57)*($G$70>=$F57),$H57*($G$69<=$F57)*($G$70>=$E57))
BX57: @IF($A57=1,$H57*($G$70<=$E57)*($G$71>=$F57),$H57*($G$70<=$F57)*($G$71>=$E57))
BY57: @IF($A57=1,$H57*($G$71<=$E57)*($G$72>=$F57),$H57*($G$71<=$F57)*($G$72>=$E57))
BZ57: @IF($A57=1,$H57*($G$72<=$E57)*($G$73>=$F57),$H57*($G$72<=$F57)*($G$73>=$E57))
P58: @IF($A58=1,$H58*($G$10<=$E58)*($G$11>=$F58),$H58*($G$10<=$F58)*($G$11>=$E58))
Q58: @IF($A58=1,$H58*($G$11<=$E58)*($G$12>=$F58),$H58*($G$11<=$F58)*($G$12>=$E58))
R58: @IF($A58=1,$H58*($G$12<=$E58)*($G$13>=$F58),$H58*($G$12<=$F58)*($G$13>=$E58))
S58: @IF($A58=1,$H58*($G$13<=$E58)*($G$14>=$F58),$H58*($G$13<=$F58)*($G$14>=$E58))
T58: @IF($A58=1,$H58*($G$14<=$E58)*($G$15>=$F58),$H58*($G$14<=$F58)*($G$15>=$E58))
U58: @IF($A58=1,$H58*($G$15<=$E58)*($G$16>=$F58),$H58*($G$15<=$F58)*($G$16>=$E58))
V58: @IF($A58=1,$H58*($G$16<=$E58)*($G$17>=$F58),$H58*($G$16<=$F58)*($G$17>=$E58))
W58: @IF($A58=1,$H58*($G$17<=$E58)*($G$18>=$F58),$H58*($G$17<=$F58)*($G$18>=$E58))
X58: @IF($A58=1,$H58*($G$18<=$E58)*($G$19>=$F58),$H58*($G$18<=$F58)*($G$19>=$E58))
Y58: @IF($A58=1,$H58*($G$19<=$E58)*($G$20>=$F58),$H58*($G$19<=$F58)*($G$20>=$E58))
Z58: @IF($A58=1,$H58*($G$20<=$E58)*($G$21>=$F58),$H58*($G$20<=$F58)*($G$21>=$E58))
AA58: @IF($A58=1,$H58*($G$21<=$E58)*($G$22>=$F58),$H58*($G$21<=$F58)*($G$22>=$E58))
AB58: @IF($A58=1,$H58*($G$22<=$E58)*($G$23>=$F58),$H58*($G$22<=$F58)*($G$23>=$E58))
AC58: @IF($A58=1,$H58*($G$23<=$E58)*($G$24>=$F58),$H58*($G$23<=$F58)*($G$24>=$E58))
AD58: @IF($A58=1,$H58*($G$24<=$E58)*($G$25>=$F58),$H58*($G$24<=$F58)*($G$25>=$E58))
AE58: @IF($A58=1,$H58*($G$25<=$E58)*($G$26>=$F58),$H58*($G$25<=$F58)*($G$26>=$E58))
AF58: @IF($A58=1,$H58*($G$26<=$E58)*($G$27>=$F58),$H58*($G$26<=$F58)*($G$27>=$E58))
AG58: @IF($A58=1,$H58*($G$27<=$E58)*($G$28>=$F58),$H58*($G$27<=$F58)*($G$28>=$E58))
```

```
AH58: @IF($A58=1,$H58*($G$28<=$E58)*($G$29>=$F58),$H58*($G$28<=$F58)*($G$29>=$E58))
AI58: @IF($A58=1,$H58*($G$29<=$E58)*($G$30>=$F58),$H58*($G$29<=$F58)*($G$30>=$E58))
AJ58: @IF($A58=1,$H58*($G$30<=$E58)*($G$31>=$F58),$H58*($G$30<=$F58)*($G$31>=$E58))
AK58: @IF($A58=1,$H58*($G$31<=$E58)*($G$32>=$F58),$H58*($G$31<=$F58)*($G$32>=$E58))
AL58: @IF($A58=1,$H58*($G$32<=$E58)*($G$33>=$F58),$H58*($G$32<=$F58)*($G$33>=$E58))
AM58: @IF($A58=1,$H58*($G$33<=$E58)*($G$34>=$F58),$H58*($G$33<=$F58)*($G$34>=$E58))
AN58: @IF($A58=1,$H58*($G$34<=$E58)*($G$35>=$F58),$H58*($G$34<=$F58)*($G$35>=$E58))
AO58: @IF($A58=1,$H58*($G$35<=$E58)*($G$36>=$F58),$H58*($G$35<=$F58)*($G$36>=$E58))
AP58: @IF($A58=1,$H58*($G$36<=$E58)*($G$37>=$F58),$H58*($G$36<=$F58)*($G$37>=$E58))
AQ58: @IF($A58=1,$H58*($G$37<=$E58)*($G$38>=$F58),$H58*($G$37<=$F58)*($G$38>=$E58))
AR58: @IF($A58=1,$H58*($G$38<=$E58)*($G$39>=$F58),$H58*($G$38<=$F58)*($G$39>=$E58))
AS58: @IF($A58=1,$H58*($G$39<=$E58)*($G$40>=$F58),$H58*($G$39<=$F58)*($G$40>=$E58))
AT58: @IF($A58=1,$H58*($G$40<=$E58)*($G$41>=$F58),$H58*($G$40<=$F58)*($G$41>=$E58))
AU58: @IF($A58=1,$H58*($G$41<=$E58)*($G$42>=$F58),$H58*($G$41<=$F58)*($G$42>=$E58))
AV58: @IF($A58=1,$H58*($G$42<=$E58)*($G$43>=$F58),$H58*($G$42<=$F58)*($G$43>=$E58))
AW58: @IF($A58=1,$H58*($G$43<=$E58)*($G$44>=$F58),$H58*($G$43<=$F58)*($G$44>=$E58))
AX58: @IF($A58=1,$H58*($G$44<=$E58)*($G$45>=$F58),$H58*($G$44<=$F58)*($G$45>=$E58))
AY58: @IF($A58=1,$H58*($G$45<=$E58)*($G$46>=$F58),$H58*($G$45<=$F58)*($G$46>=$E58))
AZ58: @IF($A58=1,$H58*($G$46<=$E58)*($G$47>=$F58),$H58*($G$46<=$F58)*($G$47>=$E58))
BA58: @IF($A58=1,$H58*($G$47<=$E58)*($G$48>=$F58),$H58*($G$47<=$F58)*($G$48>=$E58))
BB58: @IF($A58=1,$H58*($G$48<=$E58)*($G$49>=$F58),$H58*($G$48<=$F58)*($G$49>=$E58))
BC58: @IF($A58=1,$H58*($G$49<=$E58)*($G$50>=$F58),$H58*($G$49<=$F58)*($G$50>=$E58))
BD58: @IF($A58=1,$H58*($G$50<=$E58)*($G$51>=$F58),$H58*($G$50<=$F58)*($G$51>=$E58))
BE58: @IF($A58=1,$H58*($G$51<=$E58)*($G$52>=$F58),$H58*($G$51<=$F58)*($G$52>=$E58))
BF58: @IF($A58=1,$H58*($G$52<=$E58)*($G$53>=$F58),$H58*($G$52<=$F58)*($G$53>=$E58))
BG58: @IF($A58=1,$H58*($G$53<=$E58)*($G$54>=$F58),$H58*($G$53<=$F58)*($G$54>=$E58))
BH58: @IF($A58=1,$H58*($G$54<=$E58)*($G$55>=$F58),$H58*($G$54<=$F58)*($G$55>=$E58))
BI58: @IF($A58=1,$H58*($G$55<=$E58)*($G$56>=$F58),$H58*($G$55<=$F58)*($G$56>=$E58))
BJ58: @IF($A58=1,$H58*($G$56<=$E58)*($G$57>=$F58),$H58*($G$56<=$F58)*($G$57>=$E58))
BK58: @IF($A58=1,$H58*($G$57<=$E58)*($G$58>=$F58),$H58*($G$57<=$F58)*($G$58>=$E58))
BL58: @IF($A58=1,$H58*($G$58<=$E58)*($G$59>=$F58),$H58*($G$58<=$F58)*($G$59>=$E58))
BM58: @IF($A58=1,$H58*($G$59<=$E58)*($G$60>=$F58),$H58*($G$59<=$F58)*($G$60>=$E58))
BN58: @IF($A58=1,$H58*($G$60<=$E58)*($G$61>=$F58),$H58*($G$60<=$F58)*($G$61>=$E58))
BO58: @IF($A58=1,$H58*($G$61<=$E58)*($G$62>=$F58),$H58*($G$61<=$F58)*($G$62>=$E58))
BP58: @IF($A58=1,$H58*($G$62<=$E58)*($G$63>=$F58),$H58*($G$62<=$F58)*($G$63>=$E58))
BQ58: @IF($A58=1,$H58*($G$63<=$E58)*($G$64>=$F58),$H58*($G$63<=$F58)*($G$64>=$E58))
BR58: @IF($A58=1,$H58*($G$64<=$E58)*($G$65>=$F58),$H58*($G$64<=$F58)*($G$65>=$E58))
BS58: @IF($A58=1,$H58*($G$65<=$E58)*($G$66>=$F58),$H58*($G$65<=$F58)*($G$66>=$E58))
BT58: @IF($A58=1,$H58*($G$66<=$E58)*($G$67>=$F58),$H58*($G$66<=$F58)*($G$67>=$E58))
BU58: @IF($A58=1,$H58*($G$67<=$E58)*($G$68>=$F58),$H58*($G$67<=$F58)*($G$68>=$E58))
BV58: @IF($A58=1,$H58*($G$68<=$E58)*($G$69>=$F58),$H58*($G$68<=$F58)*($G$69>=$E58))
BW58: @IF($A58=1,$H58*($G$69<=$E58)*($G$70>=$F58),$H58*($G$69<=$F58)*($G$70>=$E58))
BX58: @IF($A58=1,$H58*($G$70<=$E58)*($G$71>=$F58),$H58*($G$70<=$F58)*($G$71>=$E58))
BY58: @IF($A58=1,$H58*($G$71<=$E58)*($G$72>=$F58),$H58*($G$71<=$F58)*($G$72>=$E58))
BZ58: @IF($A58=1,$H58*($G$72<=$E58)*($G$73>=$F58),$H58*($G$72<=$F58)*($G$73>=$E58))
P59: @IF($A59=1,$H59*($G$10<=$E59)*($G$11>=$F59),$H59*($G$10<=$F59)*($G$11>=$E59))
Q59: @IF($A59=1,$H59*($G$11<=$E59)*($G$12>=$F59),$H59*($G$11<=$F59)*($G$12>=$E59))
R59: @IF($A59=1,$H59*($G$12<=$E59)*($G$13>=$F59),$H59*($G$12<=$F59)*($G$13>=$E59))
S59: @IF($A59=1,$H59*($G$13<=$E59)*($G$14>=$F59),$H59*($G$13<=$F59)*($G$14>=$E59))
T59: @IF($A59=1,$H59*($G$14<=$E59)*($G$15>=$F59),$H59*($G$14<=$F59)*($G$15>=$E59))
U59: @IF($A59=1,$H59*($G$15<=$E59)*($G$16>=$F59),$H59*($G$15<=$F59)*($G$16>=$E59))
V59: @IF($A59=1,$H59*($G$16<=$E59)*($G$17>=$F59),$H59*($G$16<=$F59)*($G$17>=$E59))
W59: @IF($A59=1,$H59*($G$17<=$E59)*($G$18>=$F59),$H59*($G$17<=$F59)*($G$18>=$E59))
X59: @IF($A59=1,$H59*($G$18<=$E59)*($G$19>=$F59),$H59*($G$18<=$F59)*($G$19>=$E59))
Y59: @IF($A59=1,$H59*($G$19<=$E59)*($G$20>=$F59),$H59*($G$19<=$F59)*($G$20>=$E59))
Z59: @IF($A59=1,$H59*($G$20<=$E59)*($G$21>=$F59),$H59*($G$20<=$F59)*($G$21>=$E59))
```

```
AA59: @IF($A59=1,$H59*($G$21<=$E59)*($G$22>=$F59),$H59*($G$21<=$F59)*($G$22>=$E59))
AB59: @IF($A59=1,$H59*($G$22<=$E59)*($G$23>=$F59),$H59*($G$22<=$F59)*($G$23>=$E59))
AC59: @IF($A59=1,$H59*($G$23<=$E59)*($G$24>=$F59),$H59*($G$23<=$F59)*($G$24>=$E59))
AD59: @IF($A59=1,$H59*($G$24<=$E59)*($G$25>=$F59),$H59*($G$24<=$F59)*($G$25>=$E59))
AE59: @IF($A59=1,$H59*($G$25<=$E59)*($G$26>=$F59),$H59*($G$25<=$F59)*($G$26>=$E59))
AF59: @IF($A59=1,$H59*($G$26<=$E59)*($G$27>=$F59),$H59*($G$26<=$F59)*($G$27>=$E59))
AG59: @IF($A59=1,$H59*($G$27<=$E59)*($G$28>=$F59),$H59*($G$27<=$F59)*($G$28>=$E59))
AH59: @IF($A59=1,$H59*($G$28<=$E59)*($G$29>=$F59),$H59*($G$28<=$F59)*($G$29>=$E59))
AI59: @IF($A59=1,$H59*($G$29<=$E59)*($G$30>=$F59),$H59*($G$29<=$F59)*($G$30>=$E59))
AJ59: @IF($A59=1,$H59*($G$30<=$E59)*($G$31>=$F59),$H59*($G$30<=$F59)*($G$31>=$E59))
AK59: @IF($A59=1,$H59*($G$31<=$E59)*($G$32>=$F59),$H59*($G$31<=$F59)*($G$32>=$E59))
AL59: @IF($A59=1,$H59*($G$32<=$E59)*($G$33>=$F59),$H59*($G$32<=$F59)*($G$33>=$E59))
AM59: @IF($A59=1,$H59*($G$33<=$E59)*($G$34>=$F59),$H59*($G$33<=$F59)*($G$34>=$E59))
AN59: @IF($A59=1,$H59*($G$34<=$E59)*($G$35>=$F59),$H59*($G$34<=$F59)*($G$35>=$E59))
AO59: @IF($A59=1,$H59*($G$35<=$E59)*($G$36>=$F59),$H59*($G$35<=$F59)*($G$36>=$E59))
AP59: @IF($A59=1,$H59*($G$36<=$E59)*($G$37>=$F59),$H59*($G$36<=$F59)*($G$37>=$E59))
AQ59: @IF($A59=1,$H59*($G$37<=$E59)*($G$38>=$F59),$H59*($G$37<=$F59)*($G$38>=$E59))
AR59: @IF($A59=1,$H59*($G$38<=$E59)*($G$39>=$F59),$H59*($G$38<=$F59)*($G$39>=$E59))
AS59: @IF($A59=1,$H59*($G$39<=$E59)*($G$40>=$F59),$H59*($G$39<=$F59)*($G$40>=$E59))
AT59: @IF($A59=1,$H59*($G$40<=$E59)*($G$41>=$F59),$H59*($G$40<=$F59)*($G$41>=$E59))
AU59: @IF($A59=1,$H59*($G$41<=$E59)*($G$42>=$F59),$H59*($G$41<=$F59)*($G$42>=$E59))
AV59: @IF($A59=1,$H59*($G$42<=$E59)*($G$43>=$F59),$H59*($G$42<=$F59)*($G$43>=$E59))
AW59: @IF($A59=1,$H59*($G$43<=$E59)*($G$44>=$F59),$H59*($G$43<=$F59)*($G$44>=$E59))
AX59: @IF($A59=1,$H59*($G$44<=$E59)*($G$45>=$F59),$H59*($G$44<=$F59)*($G$45>=$E59))
AY59: @IF($A59=1,$H59*($G$45<=$E59)*($G$46>=$F59),$H59*($G$45<=$F59)*($G$46>=$E59))
AZ59: @IF($A59=1,$H59*($G$46<=$E59)*($G$47>=$F59),$H59*($G$46<=$F59)*($G$47>=$E59))
BA59: @IF($A59=1,$H59*($G$47<=$E59)*($G$48>=$F59),$H59*($G$47<=$F59)*($G$48>=$E59))
BB59: @IF($A59=1,$H59*($G$48<=$E59)*($G$49>=$F59),$H59*($G$48<=$F59)*($G$49>=$E59))
BC59: @IF($A59=1,$H59*($G$49<=$E59)*($G$50>=$F59),$H59*($G$49<=$F59)*($G$50>=$E59))
BD59: @IF($A59=1,$H59*($G$50<=$E59)*($G$51>=$F59),$H59*($G$50<=$F59)*($G$51>=$E59))
BE59: @IF($A59=1,$H59*($G$51<=$E59)*($G$52>=$F59),$H59*($G$51<=$F59)*($G$52>=$E59))
BF59: @IF($A59=1,$H59*($G$52<=$E59)*($G$53>=$F59),$H59*($G$52<=$F59)*($G$53>=$E59))
BG59: @IF($A59=1,$H59*($G$53<=$E59)*($G$54>=$F59),$H59*($G$53<=$F59)*($G$54>=$E59))
BH59: @IF($A59=1,$H59*($G$54<=$E59)*($G$55>=$F59),$H59*($G$54<=$F59)*($G$55>=$E59))
BI59: @IF($A59=1,$H59*($G$55<=$E59)*($G$56>=$F59),$H59*($G$55<=$F59)*($G$56>=$E59))
BJ59: @IF($A59=1,$H59*($G$56<=$E59)*($G$57>=$F59),$H59*($G$56<=$F59)*($G$57>=$E59))
BK59: @IF($A59=1,$H59*($G$57<=$E59)*($G$58>=$F59),$H59*($G$57<=$F59)*($G$58>=$E59))
BL59: @IF($A59=1,$H59*($G$58<=$E59)*($G$59>=$F59),$H59*($G$58<=$F59)*($G$59>=$E59))
BM59: @IF($A59=1,$H59*($G$59<=$E59)*($G$60>=$F59),$H59*($G$59<=$F59)*($G$60>=$E59))
BN59: @IF($A59=1,$H59*($G$60<=$E59)*($G$61>=$F59),$H59*($G$60<=$F59)*($G$61>=$E59))
BO59: @IF($A59=1,$H59*($G$61<=$E59)*($G$62>=$F59),$H59*($G$61<=$F59)*($G$62>=$E59))
BP59: @IF($A59=1,$H59*($G$62<=$E59)*($G$63>=$F59),$H59*($G$62<=$F59)*($G$63>=$E59))
BQ59: @IF($A59=1,$H59*($G$63<=$E59)*($G$64>=$F59),$H59*($G$63<=$F59)*($G$64>=$E59))
BR59: @IF($A59=1,$H59*($G$64<=$E59)*($G$65>=$F59),$H59*($G$64<=$F59)*($G$65>=$E59))
BS59: @IF($A59=1,$H59*($G$65<=$E59)*($G$66>=$F59),$H59*($G$65<=$F59)*($G$66>=$E59))
BT59: @IF($A59=1,$H59*($G$66<=$E59)*($G$67>=$F59),$H59*($G$66<=$F59)*($G$67>=$E59))
BU59: @IF($A59=1,$H59*($G$67<=$E59)*($G$68>=$F59),$H59*($G$67<=$F59)*($G$68>=$E59))
BV59: @IF($A59=1,$H59*($G$68<=$E59)*($G$69>=$F59),$H59*($G$68<=$F59)*($G$69>=$E59))
BW59: @IF($A59=1,$H59*($G$69<=$E59)*($G$70>=$F59),$H59*($G$69<=$F59)*($G$70>=$E59))
BX59: @IF($A59=1,$H59*($G$70<=$E59)*($G$71>=$F59),$H59*($G$70<=$F59)*($G$71>=$E59))
BY59: @IF($A59=1,$H59*($G$71<=$E59)*($G$72>=$F59),$H59*($G$71<=$F59)*($G$72>=$E59))
BZ59: @IF($A59=1,$H59*($G$72<=$E59)*($G$73>=$F59),$H59*($G$72<=$F59)*($G$73>=$E59))
P60: @IF($A60=1,$H60*($G$10<=$E60)*($G$11>=$F60),$H60*($G$10<=$F60)*($G$11>=$E60))
Q60: @IF($A60=1,$H60*($G$11<=$E60)*($G$12>=$F60),$H60*($G$11<=$F60)*($G$12>=$E60))
R60: @IF($A60=1,$H60*($G$12<=$E60)*($G$13>=$F60),$H60*($G$12<=$F60)*($G$13>=$E60))
S60: @IF($A60=1,$H60*($G$13<=$E60)*($G$14>=$F60),$H60*($G$13<=$F60)*($G$14>=$E60))
```

```
T60: @IF($A60=1,$H60*($G$14<=$E60)*($G$15>=$F60),$H60*($G$14<=$F60)*($G$15>=$E60))
U60: @IF($A60=1,$H60*($G$15<=$E60)*($G$16>=$F60),$H60*($G$15<=$F60)*($G$16>=$E60))
V60: @IF($A60=1,$H60*($G$16<=$E60)*($G$17>=$F60),$H60*($G$16<=$F60)*($G$17>=$E60))
W60: @IF($A60=1,$H60*($G$17<=$E60)*($G$18>=$F60),$H60*($G$17<=$F60)*($G$18>=$E60))
X60: @IF($A60=1,$H60*($G$18<=$E60)*($G$19>=$F60),$H60*($G$18<=$F60)*($G$19>=$E60))
Y60: @IF($A60=1,$H60*($G$19<=$E60)*($G$20>=$F60),$H60*($G$19<=$F60)*($G$20>=$E60))
Z60: @IF($A60=1,$H60*($G$20<=$E60)*($G$21>=$F60),$H60*($G$20<=$F60)*($G$21>=$E60))
AA60: @IF($A60=1,$H60*($G$21<=$E60)*($G$22>=$F60),$H60*($G$21<=$F60)*($G$22>=$E60))
AB60: @IF($A60=1,$H60*($G$22<=$E60)*($G$23>=$F60),$H60*($G$22<=$F60)*($G$23>=$E60))
AC60: @IF($A60=1,$H60*($G$23<=$E60)*($G$24>=$F60),$H60*($G$23<=$F60)*($G$24>=$E60))
AD60: @IF($A60=1,$H60*($G$24<=$E60)*($G$25>=$F60),$H60*($G$24<=$F60)*($G$25>=$E60))
AE60: @IF($A60=1,$H60*($G$25<=$E60)*($G$26>=$F60),$H60*($G$25<=$F60)*($G$26>=$E60))
AF60: @IF($A60=1,$H60*($G$26<=$E60)*($G$27>=$F60),$H60*($G$26<=$F60)*($G$27>=$E60))
AG60: @IF($A60=1,$H60*($G$27<=$E60)*($G$28>=$F60),$H60*($G$27<=$F60)*($G$28>=$E60))
AH60: @IF($A60=1,$H60*($G$28<=$E60)*($G$29>=$F60),$H60*($G$28<=$F60)*($G$29>=$E60))
AI60: @IF($A60=1,$H60*($G$29<=$E60)*($G$30>=$F60),$H60*($G$29<=$F60)*($G$30>=$E60))
AJ60: @IF($A60=1,$H60*($G$30<=$E60)*($G$31>=$F60),$H60*($G$30<=$F60)*($G$31>=$E60))
AK60: @IF($A60=1,$H60*($G$31<=$E60)*($G$32>=$F60),$H60*($G$31<=$F60)*($G$32>=$E60))
AL60: @IF($A60=1,$H60*($G$32<=$E60)*($G$33>=$F60),$H60*($G$32<=$F60)*($G$33>=$E60))
AM60: @IF($A60=1,$H60*($G$33<=$E60)*($G$34>=$F60),$H60*($G$33<=$F60)*($G$34>=$E60))
AN60: @IF($A60=1,$H60*($G$34<=$E60)*($G$35>=$F60),$H60*($G$34<=$F60)*($G$35>=$E60))
AO60: @IF($A60=1,$H60*($G$35<=$E60)*($G$36>=$F60),$H60*($G$35<=$F60)*($G$36>=$E60))
AP60: @IF($A60=1,$H60*($G$36<=$E60)*($G$37>=$F60),$H60*($G$36<=$F60)*($G$37>=$E60))
AQ60: @IF($A60=1,$H60*($G$37<=$E60)*($G$38>=$F60),$H60*($G$37<=$F60)*($G$38>=$E60))
AR60: @IF($A60=1,$H60*($G$38<=$E60)*($G$39>=$F60),$H60*($G$38<=$F60)*($G$39>=$E60))
AS60: @IF($A60=1,$H60*($G$39<=$E60)*($G$40>=$F60),$H60*($G$39<=$F60)*($G$40>=$E60))
AT60: @IF($A60=1,$H60*($G$40<=$E60)*($G$41>=$F60),$H60*($G$40<=$F60)*($G$41>=$E60))
AU60: @IF($A60=1,$H60*($G$41<=$E60)*($G$42>=$F60),$H60*($G$41<=$F60)*($G$42>=$E60))
AV60: @IF($A60=1,$H60*($G$42<=$E60)*($G$43>=$F60),$H60*($G$42<=$F60)*($G$43>=$E60))
AW60: @IF($A60=1,$H60*($G$43<=$E60)*($G$44>=$F60),$H60*($G$43<=$F60)*($G$44>=$E60))
AX60: @IF($A60=1,$H60*($G$44<=$E60)*($G$45>=$F60),$H60*($G$44<=$F60)*($G$45>=$E60))
AY60: @IF($A60=1,$H60*($G$45<=$E60)*($G$46>=$F60),$H60*($G$45<=$F60)*($G$46>=$E60))
AZ60: @IF($A60=1,$H60*($G$46<=$E60)*($G$47>=$F60),$H60*($G$46<=$F60)*($G$47>=$E60))
BA60: @IF($A60=1,$H60*($G$47<=$E60)*($G$48>=$F60),$H60*($G$47<=$F60)*($G$48>=$E60))
BB60: @IF($A60=1,$H60*($G$48<=$E60)*($G$49>=$F60),$H60*($G$48<=$F60)*($G$49>=$E60))
BC60: @IF($A60=1,$H60*($G$49<=$E60)*($G$50>=$F60),$H60*($G$49<=$F60)*($G$50>=$E60))
BD60: @IF($A60=1,$H60*($G$50<=$E60)*($G$51>=$F60),$H60*($G$50<=$F60)*($G$51>=$E60))
BE60: @IF($A60=1,$H60*($G$51<=$E60)*($G$52>=$F60),$H60*($G$51<=$F60)*($G$52>=$E60))
BF60: @IF($A60=1,$H60*($G$52<=$E60)*($G$53>=$F60),$H60*($G$52<=$F60)*($G$53>=$E60))
BG60: @IF($A60=1,$H60*($G$53<=$E60)*($G$54>=$F60),$H60*($G$53<=$F60)*($G$54>=$E60))
BH60: @IF($A60=1,$H60*($G$54<=$E60)*($G$55>=$F60),$H60*($G$54<=$F60)*($G$55>=$E60))
BI60: @IF($A60=1,$H60*($G$55<=$E60)*($G$56>=$F60),$H60*($G$55<=$F60)*($G$56>=$E60))
BJ60: @IF($A60=1,$H60*($G$56<=$E60)*($G$57>=$F60),$H60*($G$56<=$F60)*($G$57>=$E60))
BK60: @IF($A60=1,$H60*($G$57<=$E60)*($G$58>=$F60),$H60*($G$57<=$F60)*($G$58>=$E60))
BL60: @IF($A60=1,$H60*($G$58<=$E60)*($G$59>=$F60),$H60*($G$58<=$F60)*($G$59>=$E60))
BM60: @IF($A60=1,$H60*($G$59<=$E60)*($G$60>=$F60),$H60*($G$59<=$F60)*($G$60>=$E60))
BN60: @IF($A60=1,$H60*($G$60<=$E60)*($G$61>=$F60),$H60*($G$60<=$F60)*($G$61>=$E60))
BO60: @IF($A60=1,$H60*($G$61<=$E60)*($G$62>=$F60),$H60*($G$61<=$F60)*($G$62>=$E60))
BP60: @IF($A60=1,$H60*($G$62<=$E60)*($G$63>=$F60),$H60*($G$62<=$F60)*($G$63>=$E60))
BQ60: @IF($A60=1,$H60*($G$63<=$E60)*($G$64>=$F60),$H60*($G$63<=$F60)*($G$64>=$E60))
BR60: @IF($A60=1,$H60*($G$64<=$E60)*($G$65>=$F60),$H60*($G$64<=$F60)*($G$65>=$E60))
BS60: @IF($A60=1,$H60*($G$65<=$E60)*($G$66>=$F60),$H60*($G$65<=$F60)*($G$66>=$E60))
BT60: @IF($A60=1,$H60*($G$66<=$E60)*($G$67>=$F60),$H60*($G$66<=$F60)*($G$67>=$E60))
BU60: @IF($A60=1,$H60*($G$67<=$E60)*($G$68>=$F60),$H60*($G$67<=$F60)*($G$68>=$E60))
BV60: @IF($A60=1,$H60*($G$68<=$E60)*($G$69>=$F60),$H60*($G$68<=$F60)*($G$69>=$E60))
BW60: @IF($A60=1,$H60*($G$69<=$E60)*($G$70>=$F60),$H60*($G$69<=$F60)*($G$70>=$E60))
```

```
BX60: @IF($A60=1,$H60*($G$70<=$E60)*($G$71>=$F60),$H60*($G$70<=$F60)*($G$71>=$E60))
BY60: @IF($A60=1,$H60*($G$71<=$E60)*($G$72>=$F60),$H60*($G$71<=$F60)*($G$72>=$E60))
BZ60: @IF($A60=1,$H60*($G$72<=$E60)*($G$73>=$F60),$H60*($G$72<=$F60)*($G$73>=$E60))
P61: @IF($A61=1,$H61*($G$10<=$E61)*($G$11>=$F61),$H61*($G$10<=$F61)*($G$11>=$E61))
Q61: @IF($A61=1,$H61*($G$11<=$E61)*($G$12>=$F61),$H61*($G$11<=$F61)*($G$12>=$E61))
R61: @IF($A61=1,$H61*($G$12<=$E61)*($G$13>=$F61),$H61*($G$12<=$F61)*($G$13>=$E61))
S61: @IF($A61=1,$H61*($G$13<=$E61)*($G$14>=$F61),$H61*($G$13<=$F61)*($G$14>=$E61))
T61: @IF($A61=1,$H61*($G$14<=$E61)*($G$15>=$F61),$H61*($G$14<=$F61)*($G$15>=$E61))
U61: @IF($A61=1,$H61*($G$15<=$E61)*($G$16>=$F61),$H61*($G$15<=$F61)*($G$16>=$E61))
V61: @IF($A61=1,$H61*($G$16<=$E61)*($G$17>=$F61),$H61*($G$16<=$F61)*($G$17>=$E61))
W61: @IF($A61=1,$H61*($G$17<=$E61)*($G$18>=$F61),$H61*($G$17<=$F61)*($G$18>=$E61))
X61: @IF($A61=1,$H61*($G$18<=$E61)*($G$19>=$F61),$H61*($G$18<=$F61)*($G$19>=$E61))
Y61: @IF($A61=1,$H61*($G$19<=$E61)*($G$20>=$F61),$H61*($G$19<=$F61)*($G$20>=$E61))
Z61: @IF($A61=1,$H61*($G$20<=$E61)*($G$21>=$F61),$H61*($G$20<=$F61)*($G$21>=$E61))
AA61: @IF($A61=1,$H61*($G$21<=$E61)*($G$22>=$F61),$H61*($G$21<=$F61)*($G$22>=$E61))
AB61: @IF($A61=1,$H61*($G$22<=$E61)*($G$23>=$F61),$H61*($G$22<=$F61)*($G$23>=$E61))
AC61: @IF($A61=1,$H61*($G$23<=$E61)*($G$24>=$F61),$H61*($G$23<=$F61)*($G$24>=$E61))
AD61: @IF($A61=1,$H61*($G$24<=$E61)*($G$25>=$F61),$H61*($G$24<=$F61)*($G$25>=$E61))
AE61: @IF($A61=1,$H61*($G$25<=$E61)*($G$26>=$F61),$H61*($G$25<=$F61)*($G$26>=$E61))
AF61: @IF($A61=1,$H61*($G$26<=$E61)*($G$27>=$F61),$H61*($G$26<=$F61)*($G$27>=$E61))
AG61: @IF($A61=1,$H61*($G$27<=$E61)*($G$28>=$F61),$H61*($G$27<=$F61)*($G$28>=$E61))
AH61: @IF($A61=1,$H61*($G$28<=$E61)*($G$29>=$F61),$H61*($G$28<=$F61)*($G$29>=$E61))
AI61: @IF($A61=1,$H61*($G$29<=$E61)*($G$30>=$F61),$H61*($G$29<=$F61)*($G$30>=$E61))
AJ61: @IF($A61=1,$H61*($G$30<=$E61)*($G$31>=$F61),$H61*($G$30<=$F61)*($G$31>=$E61))
AK61: @IF($A61=1,$H61*($G$31<=$E61)*($G$32>=$F61),$H61*($G$31<=$F61)*($G$32>=$E61))
AL61: @IF($A61=1,$H61*($G$32<=$E61)*($G$33>=$F61),$H61*($G$32<=$F61)*($G$33>=$E61))
AM61: @IF($A61=1,$H61*($G$33<=$E61)*($G$34>=$F61),$H61*($G$33<=$F61)*($G$34>=$E61))
AN61: @IF($A61=1,$H61*($G$34<=$E61)*($G$35>=$F61),$H61*($G$34<=$F61)*($G$35>=$E61))
AO61: @IF($A61=1,$H61*($G$35<=$E61)*($G$36>=$F61),$H61*($G$35<=$F61)*($G$36>=$E61))
AP61: @IF($A61=1,$H61*($G$36<=$E61)*($G$37>=$F61),$H61*($G$36<=$F61)*($G$37>=$E61))
AQ61: @IF($A61=1,$H61*($G$37<=$E61)*($G$38>=$F61),$H61*($G$37<=$F61)*($G$38>=$E61))
AR61: @IF($A61=1,$H61*($G$38<=$E61)*($G$39>=$F61),$H61*($G$38<=$F61)*($G$39>=$E61))
AS61: @IF($A61=1,$H61*($G$39<=$E61)*($G$40>=$F61),$H61*($G$39<=$F61)*($G$40>=$E61))
AT61: @IF($A61=1,$H61*($G$40<=$E61)*($G$41>=$F61),$H61*($G$40<=$F61)*($G$41>=$E61))
AU61: @IF($A61=1,$H61*($G$41<=$E61)*($G$42>=$F61),$H61*($G$41<=$F61)*($G$42>=$E61))
AV61: @IF($A61=1,$H61*($G$42<=$E61)*($G$43>=$F61),$H61*($G$42<=$F61)*($G$43>=$E61))
AW61: @IF($A61=1,$H61*($G$43<=$E61)*($G$44>=$F61),$H61*($G$43<=$F61)*($G$44>=$E61))
AX61: @IF($A61=1,$H61*($G$44<=$E61)*($G$45>=$F61),$H61*($G$44<=$F61)*($G$45>=$E61))
AY61: @IF($A61=1,$H61*($G$45<=$E61)*($G$46>=$F61),$H61*($G$45<=$F61)*($G$46>=$E61))
AZ61: @IF($A61=1,$H61*($G$46<=$E61)*($G$47>=$F61),$H61*($G$46<=$F61)*($G$47>=$E61))
BA61: @IF($A61=1,$H61*($G$47<=$E61)*($G$48>=$F61),$H61*($G$47<=$F61)*($G$48>=$E61))
BB61: @IF($A61=1,$H61*($G$48<=$E61)*($G$49>=$F61),$H61*($G$48<=$F61)*($G$49>=$E61))
BC61: @IF($A61=1,$H61*($G$49<=$E61)*($G$50>=$F61),$H61*($G$49<=$F61)*($G$50>=$E61))
BD61: @IF($A61=1,$H61*($G$50<=$E61)*($G$51>=$F61),$H61*($G$50<=$F61)*($G$51>=$E61))
BE61: @IF($A61=1,$H61*($G$51<=$E61)*($G$52>=$F61),$H61*($G$51<=$F61)*($G$52>=$E61))
BF61: @IF($A61=1,$H61*($G$52<=$E61)*($G$53>=$F61),$H61*($G$52<=$F61)*($G$53>=$E61))
BG61: @IF($A61=1,$H61*($G$53<=$E61)*($G$54>=$F61),$H61*($G$53<=$F61)*($G$54>=$E61))
BH61: @IF($A61=1,$H61*($G$54<=$E61)*($G$55>=$F61),$H61*($G$54<=$F61)*($G$55>=$E61))
BI61: @IF($A61=1,$H61*($G$55<=$E61)*($G$56>=$F61),$H61*($G$55<=$F61)*($G$56>=$E61))
BJ61: @IF($A61=1,$H61*($G$56<=$E61)*($G$57>=$F61),$H61*($G$56<=$F61)*($G$57>=$E61))
BK61: @IF($A61=1,$H61*($G$57<=$E61)*($G$58>=$F61),$H61*($G$57<=$F61)*($G$58>=$E61))
BL61: @IF($A61=1,$H61*($G$58<=$E61)*($G$59>=$F61),$H61*($G$58<=$F61)*($G$59>=$E61))
BM61: @IF($A61=1,$H61*($G$59<=$E61)*($G$60>=$F61),$H61*($G$59<=$F61)*($G$60>=$E61))
BN61: @IF($A61=1,$H61*($G$60<=$E61)*($G$61>=$F61),$H61*($G$60<=$F61)*($G$61>=$E61))
BO61: @IF($A61=1,$H61*($G$61<=$E61)*($G$62>=$F61),$H61*($G$61<=$F61)*($G$62>=$E61))
BP61: @IF($A61=1,$H61*($G$62<=$E61)*($G$63>=$F61),$H61*($G$62<=$F61)*($G$63>=$E61))
```

```
BQ61: @IF($A61=1,$H61*($G$63<=$E61)*($G$64>=$F61),$H61*($G$63<=$F61)*($G$64>=$E61))
BR61: @IF($A61=1,$H61*($G$64<=$E61)*($G$65>=$F61),$H61*($G$64<=$F61)*($G$65>=$E61))
BS61: @IF($A61=1,$H61*($G$65<=$E61)*($G$66>=$F61),$H61*($G$65<=$F61)*($G$66>=$E61))
BT61: @IF($A61=1,$H61*($G$66<=$E61)*($G$67>=$F61),$H61*($G$66<=$F61)*($G$67>=$E61))
BU61: @IF($A61=1,$H61*($G$67<=$E61)*($G$68>=$F61),$H61*($G$67<=$F61)*($G$68>=$E61))
BV61: @IF($A61=1,$H61*($G$68<=$E61)*($G$69>=$F61),$H61*($G$68<=$F61)*($G$69>=$E61))
BW61: @IF($A61=1,$H61*($G$69<=$E61)*($G$70>=$F61),$H61*($G$69<=$F61)*($G$70>=$E61))
BX61: @IF($A61=1,$H61*($G$70<=$E61)*($G$71>=$F61),$H61*($G$70<=$F61)*($G$71>=$E61))
BY61: @IF($A61=1,$H61*($G$71<=$E61)*($G$72>=$F61),$H61*($G$71<=$F61)*($G$72>=$E61))
BZ61: @IF($A61=1,$H61*($G$72<=$E61)*($G$73>=$F61),$H61*($G$72<=$F61)*($G$73>=$E61))
P62: @IF($A62=1,$H62*($G$10<=$E62)*($G$11>=$F62),$H62*($G$10<=$F62)*($G$11>=$E62))
Q62: @IF($A62=1,$H62*($G$11<=$E62)*($G$12>=$F62),$H62*($G$11<=$F62)*($G$12>=$E62))
R62: @IF($A62=1,$H62*($G$12<=$E62)*($G$13>=$F62),$H62*($G$12<=$F62)*($G$13>=$E62))
S62: @IF($A62=1,$H62*($G$13<=$E62)*($G$14>=$F62),$H62*($G$13<=$F62)*($G$14>=$E62))
T62: @IF($A62=1,$H62*($G$14<=$E62)*($G$15>=$F62),$H62*($G$14<=$F62)*($G$15>=$E62))
U62: @IF($A62=1,$H62*($G$15<=$E62)*($G$16>=$F62),$H62*($G$15<=$F62)*($G$16>=$E62))
V62: @IF($A62=1,$H62*($G$16<=$E62)*($G$17>=$F62),$H62*($G$16<=$F62)*($G$17>=$E62))
W62: @IF($A62=1,$H62*($G$17<=$E62)*($G$18>=$F62),$H62*($G$17<=$F62)*($G$18>=$E62))
X62: @IF($A62=1,$H62*($G$18<=$E62)*($G$19>=$F62),$H62*($G$18<=$F62)*($G$19>=$E62))
Y62: @IF($A62=1,$H62*($G$19<=$E62)*($G$20>=$F62),$H62*($G$19<=$F62)*($G$20>=$E62))
Z62: @IF($A62=1,$H62*($G$20<=$E62)*($G$21>=$F62),$H62*($G$20<=$F62)*($G$21>=$E62))
AA62: @IF($A62=1,$H62*($G$21<=$E62)*($G$22>=$F62),$H62*($G$21<=$F62)*($G$22>=$E62))
AB62: @IF($A62=1,$H62*($G$22<=$E62)*($G$23>=$F62),$H62*($G$22<=$F62)*($G$23>=$E62))
AC62: @IF($A62=1,$H62*($G$23<=$E62)*($G$24>=$F62),$H62*($G$23<=$F62)*($G$24>=$E62))
AD62: @IF($A62=1,$H62*($G$24<=$E62)*($G$25>=$F62),$H62*($G$24<=$F62)*($G$25>=$E62))
AE62: @IF($A62=1,$H62*($G$25<=$E62)*($G$26>=$F62),$H62*($G$25<=$F62)*($G$26>=$E62))
AF62: @IF($A62=1,$H62*($G$26<=$E62)*($G$27>=$F62),$H62*($G$26<=$F62)*($G$27>=$E62))
AG62: @IF($A62=1,$H62*($G$27<=$E62)*($G$28>=$F62),$H62*($G$27<=$F62)*($G$28>=$E62))
AH62: @IF($A62=1,$H62*($G$28<=$E62)*($G$29>=$F62),$H62*($G$28<=$F62)*($G$29>=$E62))
AI62: @IF($A62=1,$H62*($G$29<=$E62)*($G$30>=$F62),$H62*($G$29<=$F62)*($G$30>=$E62))
AJ62: @IF($A62=1,$H62*($G$30<=$E62)*($G$31>=$F62),$H62*($G$30<=$F62)*($G$31>=$E62))
AK62: @IF($A62=1,$H62*($G$31<=$E62)*($G$32>=$F62),$H62*($G$31<=$F62)*($G$32>=$E62))
AL62: @IF($A62=1,$H62*($G$32<=$E62)*($G$33>=$F62),$H62*($G$32<=$F62)*($G$33>=$E62))
AM62: @IF($A62=1,$H62*($G$33<=$E62)*($G$34>=$F62),$H62*($G$33<=$F62)*($G$34>=$E62))
AN62: @IF($A62=1,$H62*($G$34<=$E62)*($G$35>=$F62),$H62*($G$34<=$F62)*($G$35>=$E62))
AO62: @IF($A62=1,$H62*($G$35<=$E62)*($G$36>=$F62),$H62*($G$35<=$F62)*($G$36>=$E62))
AP62: @IF($A62=1,$H62*($G$36<=$E62)*($G$37>=$F62),$H62*($G$36<=$F62)*($G$37>=$E62))
AQ62: @IF($A62=1,$H62*($G$37<=$E62)*($G$38>=$F62),$H62*($G$37<=$F62)*($G$38>=$E62))
AR62: @IF($A62=1,$H62*($G$38<=$E62)*($G$39>=$F62),$H62*($G$38<=$F62)*($G$39>=$E62))
AS62: @IF($A62=1,$H62*($G$39<=$E62)*($G$40>=$F62),$H62*($G$39<=$F62)*($G$40>=$E62))
AT62: @IF($A62=1,$H62*($G$40<=$E62)*($G$41>=$F62),$H62*($G$40<=$F62)*($G$41>=$E62))
AU62: @IF($A62=1,$H62*($G$41<=$E62)*($G$42>=$F62),$H62*($G$41<=$F62)*($G$42>=$E62))
AV62: @IF($A62=1,$H62*($G$42<=$E62)*($G$43>=$F62),$H62*($G$42<=$F62)*($G$43>=$E62))
AW62: @IF($A62=1,$H62*($G$43<=$E62)*($G$44>=$F62),$H62*($G$43<=$F62)*($G$44>=$E62))
AX62: @IF($A62=1,$H62*($G$44<=$E62)*($G$45>=$F62),$H62*($G$44<=$F62)*($G$45>=$E62))
AY62: @IF($A62=1,$H62*($G$45<=$E62)*($G$46>=$F62),$H62*($G$45<=$F62)*($G$46>=$E62))
AZ62: @IF($A62=1,$H62*($G$46<=$E62)*($G$47>=$F62),$H62*($G$46<=$F62)*($G$47>=$E62))
BA62: @IF($A62=1,$H62*($G$47<=$E62)*($G$48>=$F62),$H62*($G$47<=$F62)*($G$48>=$E62))
BB62: @IF($A62=1,$H62*($G$48<=$E62)*($G$49>=$F62),$H62*($G$48<=$F62)*($G$49>=$E62))
BC62: @IF($A62=1,$H62*($G$49<=$E62)*($G$50>=$F62),$H62*($G$49<=$F62)*($G$50>=$E62))
BD62: @IF($A62=1,$H62*($G$50<=$E62)*($G$51>=$F62),$H62*($G$50<=$F62)*($G$51>=$E62))
BE62: @IF($A62=1,$H62*($G$51<=$E62)*($G$52>=$F62),$H62*($G$51<=$F62)*($G$52>=$E62))
BF62: @IF($A62=1,$H62*($G$52<=$E62)*($G$53>=$F62),$H62*($G$52<=$F62)*($G$53>=$E62))
BG62: @IF($A62=1,$H62*($G$53<=$E62)*($G$54>=$F62),$H62*($G$53<=$F62)*($G$54>=$E62))
BH62: @IF($A62=1,$H62*($G$54<=$E62)*($G$55>=$F62),$H62*($G$54<=$F62)*($G$55>=$E62))
BI62: @IF($A62=1,$H62*($G$55<=$E62)*($G$56>=$F62),$H62*($G$55<=$F62)*($G$56>=$E62))
```

```
BJ62: @IF($A62=1,$H62*($G$56<=$E62)*($G$57>=$F62),$H62*($G$56<=$F62)*($G$57>=$E62))
BK62: @IF($A62=1,$H62*($G$57<=$E62)*($G$58>=$F62),$H62*($G$57<=$F62)*($G$58>=$E62))
BL62: @IF($A62=1,$H62*($G$58<=$E62)*($G$59>=$F62),$H62*($G$58<=$F62)*($G$59>=$E62))
BM62: @IF($A62=1,$H62*($G$59<=$E62)*($G$60>=$F62),$H62*($G$59<=$F62)*($G$60>=$E62))
BN62: @IF($A62=1,$H62*($G$60<=$E62)*($G$61>=$F62),$H62*($G$60<=$F62)*($G$61>=$E62))
BO62: @IF($A62=1,$H62*($G$61<=$E62)*($G$62>=$F62),$H62*($G$61<=$F62)*($G$62>=$E62))
BP62: @IF($A62=1,$H62*($G$62<=$E62)*($G$63>=$F62),$H62*($G$62<=$F62)*($G$63>=$E62))
BQ62: @IF($A62=1,$H62*($G$63<=$E62)*($G$64>=$F62),$H62*($G$63<=$F62)*($G$64>=$E62))
BR62: @IF($A62=1,$H62*($G$64<=$E62)*($G$65>=$F62),$H62*($G$64<=$F62)*($G$65>=$E62))
BS62: @IF($A62=1,$H62*($G$65<=$E62)*($G$66>=$F62),$H62*($G$65<=$F62)*($G$66>=$E62))
BT62: @IF($A62=1,$H62*($G$66<=$E62)*($G$67>=$F62),$H62*($G$66<=$F62)*($G$67>=$E62))
BU62: @IF($A62=1,$H62*($G$67<=$E62)*($G$68>=$F62),$H62*($G$67<=$F62)*($G$68>=$E62))
BV62: @IF($A62=1,$H62*($G$68<=$E62)*($G$69>=$F62),$H62*($G$68<=$F62)*($G$69>=$E62))
BW62: @IF($A62=1,$H62*($G$69<=$E62)*($G$70>=$F62),$H62*($G$69<=$F62)*($G$70>=$E62))
BX62: @IF($A62=1,$H62*($G$70<=$E62)*($G$71>=$F62),$H62*($G$70<=$F62)*($G$71>=$E62))
BY62: @IF($A62=1,$H62*($G$71<=$E62)*($G$72>=$F62),$H62*($G$71<=$F62)*($G$72>=$E62))
BZ62: @IF($A62=1,$H62*($G$72<=$E62)*($G$73>=$F62),$H62*($G$72<=$F62)*($G$73>=$E62))
P63: @IF($A63=1,$H63*($G$10<=$E63)*($G$11>=$F63),$H63*($G$10<=$F63)*($G$11>=$E63))
Q63: @IF($A63=1,$H63*($G$11<=$E63)*($G$12>=$F63),$H63*($G$11<=$F63)*($G$12>=$E63))
R63: @IF($A63=1,$H63*($G$12<=$E63)*($G$13>=$F63),$H63*($G$12<=$F63)*($G$13>=$E63))
S63: @IF($A63=1,$H63*($G$13<=$E63)*($G$14>=$F63),$H63*($G$13<=$F63)*($G$14>=$E63))
T63: @IF($A63=1,$H63*($G$14<=$E63)*($G$15>=$F63),$H63*($G$14<=$F63)*($G$15>=$E63))
U63: @IF($A63=1,$H63*($G$15<=$E63)*($G$16>=$F63),$H63*($G$15<=$F63)*($G$16>=$E63))
V63: @IF($A63=1,$H63*($G$16<=$E63)*($G$17>=$F63),$H63*($G$16<=$F63)*($G$17>=$E63))
W63: @IF($A63=1,$H63*($G$17<=$E63)*($G$18>=$F63),$H63*($G$17<=$F63)*($G$18>=$E63))
X63: @IF($A63=1,$H63*($G$18<=$E63)*($G$19>=$F63),$H63*($G$18<=$F63)*($G$19>=$E63))
Y63: @IF($A63=1,$H63*($G$19<=$E63)*($G$20>=$F63),$H63*($G$19<=$F63)*($G$20>=$E63))
Z63: @IF($A63=1,$H63*($G$20<=$E63)*($G$21>=$F63),$H63*($G$20<=$F63)*($G$21>=$E63))
AA63: @IF($A63=1,$H63*($G$21<=$E63)*($G$22>=$F63),$H63*($G$21<=$F63)*($G$22>=$E63))
AB63: @IF($A63=1,$H63*($G$22<=$E63)*($G$23>=$F63),$H63*($G$22<=$F63)*($G$23>=$E63))
AC63: @IF($A63=1,$H63*($G$23<=$E63)*($G$24>=$F63),$H63*($G$23<=$F63)*($G$24>=$E63))
AD63: @IF($A63=1,$H63*($G$24<=$E63)*($G$25>=$F63),$H63*($G$24<=$F63)*($G$25>=$E63))
AE63: @IF($A63=1,$H63*($G$25<=$E63)*($G$26>=$F63),$H63*($G$25<=$F63)*($G$26>=$E63))
AF63: @IF($A63=1,$H63*($G$26<=$E63)*($G$27>=$F63),$H63*($G$26<=$F63)*($G$27>=$E63))
AG63: @IF($A63=1,$H63*($G$27<=$E63)*($G$28>=$F63),$H63*($G$27<=$F63)*($G$28>=$E63))
AH63: @IF($A63=1,$H63*($G$28<=$E63)*($G$29>=$F63),$H63*($G$28<=$F63)*($G$29>=$E63))
AI63: @IF($A63=1,$H63*($G$29<=$E63)*($G$30>=$F63),$H63*($G$29<=$F63)*($G$30>=$E63))
AJ63: @IF($A63=1,$H63*($G$30<=$E63)*($G$31>=$F63),$H63*($G$30<=$F63)*($G$31>=$E63))
AK63: @IF($A63=1,$H63*($G$31<=$E63)*($G$32>=$F63),$H63*($G$31<=$F63)*($G$32>=$E63))
AL63: @IF($A63=1,$H63*($G$32<=$E63)*($G$33>=$F63),$H63*($G$32<=$F63)*($G$33>=$E63))
AM63: @IF($A63=1,$H63*($G$33<=$E63)*($G$34>=$F63),$H63*($G$33<=$F63)*($G$34>=$E63))
AN63: @IF($A63=1,$H63*($G$34<=$E63)*($G$35>=$F63),$H63*($G$34<=$F63)*($G$35>=$E63))
AO63: @IF($A63=1,$H63*($G$35<=$E63)*($G$36>=$F63),$H63*($G$35<=$F63)*($G$36>=$E63))
AP63: @IF($A63=1,$H63*($G$36<=$E63)*($G$37>=$F63),$H63*($G$36<=$F63)*($G$37>=$E63))
AQ63: @IF($A63=1,$H63*($G$37<=$E63)*($G$38>=$F63),$H63*($G$37<=$F63)*($G$38>=$E63))
AR63: @IF($A63=1,$H63*($G$38<=$E63)*($G$39>=$F63),$H63*($G$38<=$F63)*($G$39>=$E63))
AS63: @IF($A63=1,$H63*($G$39<=$E63)*($G$40>=$F63),$H63*($G$39<=$F63)*($G$40>=$E63))
AT63: @IF($A63=1,$H63*($G$40<=$E63)*($G$41>=$F63),$H63*($G$40<=$F63)*($G$41>=$E63))
AU63: @IF($A63=1,$H63*($G$41<=$E63)*($G$42>=$F63),$H63*($G$41<=$F63)*($G$42>=$E63))
AV63: @IF($A63=1,$H63*($G$42<=$E63)*($G$43>=$F63),$H63*($G$42<=$F63)*($G$43>=$E63))
AW63: @IF($A63=1,$H63*($G$43<=$E63)*($G$44>=$F63),$H63*($G$43<=$F63)*($G$44>=$E63))
AX63: @IF($A63=1,$H63*($G$44<=$E63)*($G$45>=$F63),$H63*($G$44<=$F63)*($G$45>=$E63))
AY63: @IF($A63=1,$H63*($G$45<=$E63)*($G$46>=$F63),$H63*($G$45<=$F63)*($G$46>=$E63))
AZ63: @IF($A63=1,$H63*($G$46<=$E63)*($G$47>=$F63),$H63*($G$46<=$F63)*($G$47>=$E63))
BA63: @IF($A63=1,$H63*($G$47<=$E63)*($G$48>=$F63),$H63*($G$47<=$F63)*($G$48>=$E63))
BB63: @IF($A63=1,$H63*($G$48<=$E63)*($G$49>=$F63),$H63*($G$48<=$F63)*($G$49>=$E63))
```

```
BC63: @IF($A63=1,$H63*($G$49<=$E63)*($G$50>=$F63),$H63*($G$49<=$F63)*($G$50>=$E63))
BD63: @IF($A63=1,$H63*($G$50<=$E63)*($G$51>=$F63),$H63*($G$50<=$F63)*($G$51>=$E63))
BE63: @IF($A63=1,$H63*($G$51<=$E63)*($G$52>=$F63),$H63*($G$51<=$F63)*($G$52>=$E63))
BF63: @IF($A63=1,$H63*($G$52<=$E63)*($G$53>=$F63),$H63*($G$52<=$F63)*($G$53>=$E63))
BG63: @IF($A63=1,$H63*($G$53<=$E63)*($G$54>=$F63),$H63*($G$53<=$F63)*($G$54>=$E63))
BH63: @IF($A63=1,$H63*($G$54<=$E63)*($G$55>=$F63),$H63*($G$54<=$F63)*($G$55>=$E63))
BI63: @IF($A63=1,$H63*($G$55<=$E63)*($G$56>=$F63),$H63*($G$55<=$F63)*($G$56>=$E63))
BJ63: @IF($A63=1,$H63*($G$56<=$E63)*($G$57>=$F63),$H63*($G$56<=$F63)*($G$57>=$E63))
BK63: @IF($A63=1,$H63*($G$57<=$E63)*($G$58>=$F63),$H63*($G$57<=$F63)*($G$58>=$E63))
BL63: @IF($A63=1,$H63*($G$58<=$E63)*($G$59>=$F63),$H63*($G$58<=$F63)*($G$59>=$E63))
BM63: @IF($A63=1,$H63*($G$59<=$E63)*($G$60>=$F63),$H63*($G$59<=$F63)*($G$60>=$E63))
BN63: @IF($A63=1,$H63*($G$60<=$E63)*($G$61>=$F63),$H63*($G$60<=$F63)*($G$61>=$E63))
BO63: @IF($A63=1,$H63*($G$61<=$E63)*($G$62>=$F63),$H63*($G$61<=$F63)*($G$62>=$E63))
BP63: @IF($A63=1,$H63*($G$62<=$E63)*($G$63>=$F63),$H63*($G$62<=$F63)*($G$63>=$E63))
BQ63: @IF($A63=1,$H63*($G$63<=$E63)*($G$64>=$F63),$H63*($G$63<=$F63)*($G$64>=$E63))
BR63: @IF($A63=1,$H63*($G$64<=$E63)*($G$65>=$F63),$H63*($G$64<=$F63)*($G$65>=$E63))
BS63: @IF($A63=1,$H63*($G$65<=$E63)*($G$66>=$F63),$H63*($G$65<=$F63)*($G$66>=$E63))
BT63: @IF($A63=1,$H63*($G$66<=$E63)*($G$67>=$F63),$H63*($G$66<=$F63)*($G$67>=$E63))
BU63: @IF($A63=1,$H63*($G$67<=$E63)*($G$68>=$F63),$H63*($G$67<=$F63)*($G$68>=$E63))
BV63: @IF($A63=1,$H63*($G$68<=$E63)*($G$69>=$F63),$H63*($G$68<=$F63)*($G$69>=$E63))
BW63: @IF($A63=1,$H63*($G$69<=$E63)*($G$70>=$F63),$H63*($G$69<=$F63)*($G$70>=$E63))
BX63: @IF($A63=1,$H63*($G$70<=$E63)*($G$71>=$F63),$H63*($G$70<=$F63)*($G$71>=$E63))
BY63: @IF($A63=1,$H63*($G$71<=$E63)*($G$72>=$F63),$H63*($G$71<=$F63)*($G$72>=$E63))
BZ63: @IF($A63=1,$H63*($G$72<=$E63)*($G$73>=$F63),$H63*($G$72<=$F63)*($G$73>=$E63))
P64: @IF($A64=1,$H64*($G$10<=$E64)*($G$11>=$F64),$H64*($G$10<=$F64)*($G$11>=$E64))
Q64: @IF($A64=1,$H64*($G$11<=$E64)*($G$12>=$F64),$H64*($G$11<=$F64)*($G$12>=$E64))
R64: @IF($A64=1,$H64*($G$12<=$E64)*($G$13>=$F64),$H64*($G$12<=$F64)*($G$13>=$E64))
S64: @IF($A64=1,$H64*($G$13<=$E64)*($G$14>=$F64),$H64*($G$13<=$F64)*($G$14>=$E64))
T64: @IF($A64=1,$H64*($G$14<=$E64)*($G$15>=$F64),$H64*($G$14<=$F64)*($G$15>=$E64))
U64: @IF($A64=1,$H64*($G$15<=$E64)*($G$16>=$F64),$H64*($G$15<=$F64)*($G$16>=$E64))
V64: @IF($A64=1,$H64*($G$16<=$E64)*($G$17>=$F64),$H64*($G$16<=$F64)*($G$17>=$E64))
W64: @IF($A64=1,$H64*($G$17<=$E64)*($G$18>=$F64),$H64*($G$17<=$F64)*($G$18>=$E64))
X64: @IF($A64=1,$H64*($G$18<=$E64)*($G$19>=$F64),$H64*($G$18<=$F64)*($G$19>=$E64))
Y64: @IF($A64=1,$H64*($G$19<=$E64)*($G$20>=$F64),$H64*($G$19<=$F64)*($G$20>=$E64))
Z64: @IF($A64=1,$H64*($G$20<=$E64)*($G$21>=$F64),$H64*($G$20<=$F64)*($G$21>=$E64))
AA64: @IF($A64=1,$H64*($G$21<=$E64)*($G$22>=$F64),$H64*($G$21<=$F64)*($G$22>=$E64))
AB64: @IF($A64=1,$H64*($G$22<=$E64)*($G$23>=$F64),$H64*($G$22<=$F64)*($G$23>=$E64))
AC64: @IF($A64=1,$H64*($G$23<=$E64)*($G$24>=$F64),$H64*($G$23<=$F64)*($G$24>=$E64))
AD64: @IF($A64=1,$H64*($G$24<=$E64)*($G$25>=$F64),$H64*($G$24<=$F64)*($G$25>=$E64))
AE64: @IF($A64=1,$H64*($G$25<=$E64)*($G$26>=$F64),$H64*($G$25<=$F64)*($G$26>=$E64))
AF64: @IF($A64=1,$H64*($G$26<=$E64)*($G$27>=$F64),$H64*($G$26<=$F64)*($G$27>=$E64))
AG64: @IF($A64=1,$H64*($G$27<=$E64)*($G$28>=$F64),$H64*($G$27<=$F64)*($G$28>=$E64))
AH64: @IF($A64=1,$H64*($G$28<=$E64)*($G$29>=$F64),$H64*($G$28<=$F64)*($G$29>=$E64))
AI64: @IF($A64=1,$H64*($G$29<=$E64)*($G$30>=$F64),$H64*($G$29<=$F64)*($G$30>=$E64))
AJ64: @IF($A64=1,$H64*($G$30<=$E64)*($G$31>=$F64),$H64*($G$30<=$F64)*($G$31>=$E64))
AK64: @IF($A64=1,$H64*($G$31<=$E64)*($G$32>=$F64),$H64*($G$31<=$F64)*($G$32>=$E64))
AL64: @IF($A64=1,$H64*($G$32<=$E64)*($G$33>=$F64),$H64*($G$32<=$F64)*($G$33>=$E64))
AM64: @IF($A64=1,$H64*($G$33<=$E64)*($G$34>=$F64),$H64*($G$33<=$F64)*($G$34>=$E64))
AN64: @IF($A64=1,$H64*($G$34<=$E64)*($G$35>=$F64),$H64*($G$34<=$F64)*($G$35>=$E64))
AO64: @IF($A64=1,$H64*($G$35<=$E64)*($G$36>=$F64),$H64*($G$35<=$F64)*($G$36>=$E64))
AP64: @IF($A64=1,$H64*($G$36<=$E64)*($G$37>=$F64),$H64*($G$36<=$F64)*($G$37>=$E64))
AQ64: @IF($A64=1,$H64*($G$37<=$E64)*($G$38>=$F64),$H64*($G$37<=$F64)*($G$38>=$E64))
AR64: @IF($A64=1,$H64*($G$38<=$E64)*($G$39>=$F64),$H64*($G$38<=$F64)*($G$39>=$E64))
AS64: @IF($A64=1,$H64*($G$39<=$E64)*($G$40>=$F64),$H64*($G$39<=$F64)*($G$40>=$E64))
AT64: @IF($A64=1,$H64*($G$40<=$E64)*($G$41>=$F64),$H64*($G$40<=$F64)*($G$41>=$E64))
AU64: @IF($A64=1,$H64*($G$41<=$E64)*($G$42>=$F64),$H64*($G$41<=$F64)*($G$42>=$E64))
```

```
AV64: @IF($A64=1,$H64*($G$42<=$E64)*($G$43>=$F64),$H64*($G$42<=$F64)*($G$43>=$E64))
AW64: @IF($A64=1,$H64*($G$43<=$E64)*($G$44>=$F64),$H64*($G$43<=$F64)*($G$44>=$E64))
AX64: @IF($A64=1,$H64*($G$44<=$E64)*($G$45>=$F64),$H64*($G$44<=$F64)*($G$45>=$E64))
AY64: @IF($A64=1,$H64*($G$45<=$E64)*($G$46>=$F64),$H64*($G$45<=$F64)*($G$46>=$E64))
AZ64: @IF($A64=1,$H64*($G$46<=$E64)*($G$47>=$F64),$H64*($G$46<=$F64)*($G$47>=$E64))
BA64: @IF($A64=1,$H64*($G$47<=$E64)*($G$48>=$F64),$H64*($G$47<=$F64)*($G$48>=$E64))
BB64: @IF($A64=1,$H64*($G$48<=$E64)*($G$49>=$F64),$H64*($G$48<=$F64)*($G$49>=$E64))
BC64: @IF($A64=1,$H64*($G$49<=$E64)*($G$50>=$F64),$H64*($G$49<=$F64)*($G$50>=$E64))
BD64: @IF($A64=1,$H64*($G$50<=$E64)*($G$51>=$F64),$H64*($G$50<=$F64)*($G$51>=$E64))
BE64: @IF($A64=1,$H64*($G$51<=$E64)*($G$52>=$F64),$H64*($G$51<=$F64)*($G$52>=$E64))
BF64: @IF($A64=1,$H64*($G$52<=$E64)*($G$53>=$F64),$H64*($G$52<=$F64)*($G$53>=$E64))
BG64: @IF($A64=1,$H64*($G$53<=$E64)*($G$54>=$F64),$H64*($G$53<=$F64)*($G$54>=$E64))
BH64: @IF($A64=1,$H64*($G$54<=$E64)*($G$55>=$F64),$H64*($G$54<=$F64)*($G$55>=$E64))
BI64: @IF($A64=1,$H64*($G$55<=$E64)*($G$56>=$F64),$H64*($G$55<=$F64)*($G$56>=$E64))
BJ64: @IF($A64=1,$H64*($G$56<=$E64)*($G$57>=$F64),$H64*($G$56<=$F64)*($G$57>=$E64))
BK64: @IF($A64=1,$H64*($G$57<=$E64)*($G$58>=$F64),$H64*($G$57<=$F64)*($G$58>=$E64))
BL64: @IF($A64=1,$H64*($G$58<=$E64)*($G$59>=$F64),$H64*($G$58<=$F64)*($G$59>=$E64))
BM64: @IF($A64=1,$H64*($G$59<=$E64)*($G$60>=$F64),$H64*($G$59<=$F64)*($G$60>=$E64))
BN64: @IF($A64=1,$H64*($G$60<=$E64)*($G$61>=$F64),$H64*($G$60<=$F64)*($G$61>=$E64))
BO64: @IF($A64=1,$H64*($G$61<=$E64)*($G$62>=$F64),$H64*($G$61<=$F64)*($G$62>=$E64))
BP64: @IF($A64=1,$H64*($G$62<=$E64)*($G$63>=$F64),$H64*($G$62<=$F64)*($G$63>=$E64))
BQ64: @IF($A64=1,$H64*($G$63<=$E64)*($G$64>=$F64),$H64*($G$63<=$F64)*($G$64>=$E64))
BR64: @IF($A64=1,$H64*($G$64<=$E64)*($G$65>=$F64),$H64*($G$64<=$F64)*($G$65>=$E64))
BS64: @IF($A64=1,$H64*($G$65<=$E64)*($G$66>=$F64),$H64*($G$65<=$F64)*($G$66>=$E64))
BT64: @IF($A64=1,$H64*($G$66<=$E64)*($G$67>=$F64),$H64*($G$66<=$F64)*($G$67>=$E64))
BU64: @IF($A64=1,$H64*($G$67<=$E64)*($G$68>=$F64),$H64*($G$67<=$F64)*($G$68>=$E64))
BV64: @IF($A64=1,$H64*($G$68<=$E64)*($G$69>=$F64),$H64*($G$68<=$F64)*($G$69>=$E64))
BW64: @IF($A64=1,$H64*($G$69<=$E64)*($G$70>=$F64),$H64*($G$69<=$F64)*($G$70>=$E64))
BX64: @IF($A64=1,$H64*($G$70<=$E64)*($G$71>=$F64),$H64*($G$70<=$F64)*($G$71>=$E64))
BY64: @IF($A64=1,$H64*($G$71<=$E64)*($G$72>=$F64),$H64*($G$71<=$F64)*($G$72>=$E64))
BZ64: @IF($A64=1,$H64*($G$72<=$E64)*($G$73>=$F64),$H64*($G$72<=$F64)*($G$73>=$E64))
P65: @IF($A65=1,$H65*($G$10<=$E65)*($G$11>=$F65),$H65*($G$10<=$F65)*($G$11>=$E65))
Q65: @IF($A65=1,$H65*($G$11<=$E65)*($G$12>=$F65),$H65*($G$11<=$F65)*($G$12>=$E65))
R65: @IF($A65=1,$H65*($G$12<=$E65)*($G$13>=$F65),$H65*($G$12<=$F65)*($G$13>=$E65))
S65: @IF($A65=1,$H65*($G$13<=$E65)*($G$14>=$F65),$H65*($G$13<=$F65)*($G$14>=$E65))
T65: @IF($A65=1,$H65*($G$14<=$E65)*($G$15>=$F65),$H65*($G$14<=$F65)*($G$15>=$E65))
U65: @IF($A65=1,$H65*($G$15<=$E65)*($G$16>=$F65),$H65*($G$15<=$F65)*($G$16>=$E65))
V65: @IF($A65=1,$H65*($G$16<=$E65)*($G$17>=$F65),$H65*($G$16<=$F65)*($G$17>=$E65))
W65: @IF($A65=1,$H65*($G$17<=$E65)*($G$18>=$F65),$H65*($G$17<=$F65)*($G$18>=$E65))
X65: @IF($A65=1,$H65*($G$18<=$E65)*($G$19>=$F65),$H65*($G$18<=$F65)*($G$19>=$E65))
Y65: @IF($A65=1,$H65*($G$19<=$E65)*($G$20>=$F65),$H65*($G$19<=$F65)*($G$20>=$E65))
Z65: @IF($A65=1,$H65*($G$20<=$E65)*($G$21>=$F65),$H65*($G$20<=$F65)*($G$21>=$E65))
AA65: @IF($A65=1,$H65*($G$21<=$E65)*($G$22>=$F65),$H65*($G$21<=$F65)*($G$22>=$E65))
AB65: @IF($A65=1,$H65*($G$22<=$E65)*($G$23>=$F65),$H65*($G$22<=$F65)*($G$23>=$E65))
AC65: @IF($A65=1,$H65*($G$23<=$E65)*($G$24>=$F65),$H65*($G$23<=$F65)*($G$24>=$E65))
AD65: @IF($A65=1,$H65*($G$24<=$E65)*($G$25>=$F65),$H65*($G$24<=$F65)*($G$25>=$E65))
AE65: @IF($A65=1,$H65*($G$25<=$E65)*($G$26>=$F65),$H65*($G$25<=$F65)*($G$26>=$E65))
AF65: @IF($A65=1,$H65*($G$26<=$E65)*($G$27>=$F65),$H65*($G$26<=$F65)*($G$27>=$E65))
AG65: @IF($A65=1,$H65*($G$27<=$E65)*($G$28>=$F65),$H65*($G$27<=$F65)*($G$28>=$E65))
AH65: @IF($A65=1,$H65*($G$28<=$E65)*($G$29>=$F65),$H65*($G$28<=$F65)*($G$29>=$E65))
AI65: @IF($A65=1,$H65*($G$29<=$E65)*($G$30>=$F65),$H65*($G$29<=$F65)*($G$30>=$E65))
AJ65: @IF($A65=1,$H65*($G$30<=$E65)*($G$31>=$F65),$H65*($G$30<=$F65)*($G$31>=$E65))
AK65: @IF($A65=1,$H65*($G$31<=$E65)*($G$32>=$F65),$H65*($G$31<=$F65)*($G$32>=$E65))
AL65: @IF($A65=1,$H65*($G$32<=$E65)*($G$33>=$F65),$H65*($G$32<=$F65)*($G$33>=$E65))
AM65: @IF($A65=1,$H65*($G$33<=$E65)*($G$34>=$F65),$H65*($G$33<=$F65)*($G$34>=$E65))
AN65: @IF($A65=1,$H65*($G$34<=$E65)*($G$35>=$F65),$H65*($G$34<=$F65)*($G$35>=$E65))
```

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AO65: @IF($A65=1,$H65*($G$35<=$E65)*($G$36>=$F65),$H65*($G$35<=$F65)*($G$36>=$E65))
AP65: @IF($A65=1,$H65*($G$36<=$E65)*($G$37>=$F65),$H65*($G$36<=$F65)*($G$37>=$E65))
AQ65: @IF($A65=1,$H65*($G$37<=$E65)*($G$38>=$F65),$H65*($G$37<=$F65)*($G$38>=$E65))
AR65: @IF($A65=1,$H65*($G$38<=$E65)*($G$39>=$F65),$H65*($G$38<=$F65)*($G$39>=$E65))
AS65: @IF($A65=1,$H65*($G$39<=$E65)*($G$40>=$F65),$H65*($G$39<=$F65)*($G$40>=$E65))
AT65: @IF($A65=1,$H65*($G$40<=$E65)*($G$41>=$F65),$H65*($G$40<=$F65)*($G$41>=$E65))
AU65: @IF($A65=1,$H65*($G$41<=$E65)*($G$42>=$F65),$H65*($G$41<=$F65)*($G$42>=$E65))
AV65: @IF($A65=1,$H65*($G$42<=$E65)*($G$43>=$F65),$H65*($G$42<=$F65)*($G$43>=$E65))
AW65: @IF($A65=1,$H65*($G$43<=$E65)*($G$44>=$F65),$H65*($G$43<=$F65)*($G$44>=$E65))
AX65: @IF($A65=1,$H65*($G$44<=$E65)*($G$45>=$F65),$H65*($G$44<=$F65)*($G$45>=$E65))
AY65: @IF($A65=1,$H65*($G$45<=$E65)*($G$46>=$F65),$H65*($G$45<=$F65)*($G$46>=$E65))
AZ65: @IF($A65=1,$H65*($G$46<=$E65)*($G$47>=$F65),$H65*($G$46<=$F65)*($G$47>=$E65))
BA65: @IF($A65=1,$H65*($G$47<=$E65)*($G$48>=$F65),$H65*($G$47<=$F65)*($G$48>=$E65))
BB65: @IF($A65=1,$H65*($G$48<=$E65)*($G$49>=$F65),$H65*($G$48<=$F65)*($G$49>=$E65))
BC65: @IF($A65=1,$H65*($G$49<=$E65)*($G$50>=$F65),$H65*($G$49<=$F65)*($G$50>=$E65))
BD65: @IF($A65=1,$H65*($G$50<=$E65)*($G$51>=$F65),$H65*($G$50<=$F65)*($G$51>=$E65))
BE65: @IF($A65=1,$H65*($G$51<=$E65)*($G$52>=$F65),$H65*($G$51<=$F65)*($G$52>=$E65))
BF65: @IF($A65=1,$H65*($G$52<=$E65)*($G$53>=$F65),$H65*($G$52<=$F65)*($G$53>=$E65))
BG65: @IF($A65=1,$H65*($G$53<=$E65)*($G$54>=$F65),$H65*($G$53<=$F65)*($G$54>=$E65))
BH65: @IF($A65=1,$H65*($G$54<=$E65)*($G$55>=$F65),$H65*($G$54<=$F65)*($G$55>=$E65))
BI65: @IF($A65=1,$H65*($G$55<=$E65)*($G$56>=$F65),$H65*($G$55<=$F65)*($G$56>=$E65))
BJ65: @IF($A65=1,$H65*($G$56<=$E65)*($G$57>=$F65),$H65*($G$56<=$F65)*($G$57>=$E65))
BK65: @IF($A65=1,$H65*($G$57<=$E65)*($G$58>=$F65),$H65*($G$57<=$F65)*($G$58>=$E65))
BL65: @IF($A65=1,$H65*($G$58<=$E65)*($G$59>=$F65),$H65*($G$58<=$F65)*($G$59>=$E65))
BM65: @IF($A65=1,$H65*($G$59<=$E65)*($G$60>=$F65),$H65*($G$59<=$F65)*($G$60>=$E65))
BN65: @IF($A65=1,$H65*($G$60<=$E65)*($G$61>=$F65),$H65*($G$60<=$F65)*($G$61>=$E65))
BO65: @IF($A65=1,$H65*($G$61<=$E65)*($G$62>=$F65),$H65*($G$61<=$F65)*($G$62>=$E65))
BP65: @IF($A65=1,$H65*($G$62<=$E65)*($G$63>=$F65),$H65*($G$62<=$F65)*($G$63>=$E65))
BQ65: @IF($A65=1,$H65*($G$63<=$E65)*($G$64>=$F65),$H65*($G$63<=$F65)*($G$64>=$E65))
BR65: @IF($A65=1,$H65*($G$64<=$E65)*($G$65>=$F65),$H65*($G$64<=$F65)*($G$65>=$E65))
BS65: @IF($A65=1,$H65*($G$65<=$E65)*($G$66>=$F65),$H65*($G$65<=$F65)*($G$66>=$E65))
BT65: @IF($A65=1,$H65*($G$66<=$E65)*($G$67>=$F65),$H65*($G$66<=$F65)*($G$67>=$E65))
BU65: @IF($A65=1,$H65*($G$67<=$E65)*($G$68>=$F65),$H65*($G$67<=$F65)*($G$68>=$E65))
BV65: @IF($A65=1,$H65*($G$68<=$E65)*($G$69>=$F65),$H65*($G$68<=$F65)*($G$69>=$E65))
BW65: @IF($A65=1,$H65*($G$69<=$E65)*($G$70>=$F65),$H65*($G$69<=$F65)*($G$70>=$E65))
BX65: @IF($A65=1,$H65*($G$70<=$E65)*($G$71>=$F65),$H65*($G$70<=$F65)*($G$71>=$E65))
BY65: @IF($A65=1,$H65*($G$71<=$E65)*($G$72>=$F65),$H65*($G$71<=$F65)*($G$72>=$E65))
BZ65: @IF($A65=1,$H65*($G$72<=$E65)*($G$73>=$F65),$H65*($G$72<=$F65)*($G$73>=$E65))
P66: @IF($A66=1,$H66*($G$10<=$E66)*($G$11>=$F66),$H66*($G$10<=$F66)*($G$11>=$E66))
Q66: @IF($A66=1,$H66*($G$11<=$E66)*($G$12>=$F66),$H66*($G$11<=$F66)*($G$12>=$E66))
R66: @IF($A66=1,$H66*($G$12<=$E66)*($G$13>=$F66),$H66*($G$12<=$F66)*($G$13>=$E66))
S66: @IF($A66=1,$H66*($G$13<=$E66)*($G$14>=$F66),$H66*($G$13<=$F66)*($G$14>=$E66))
T66: @IF($A66=1,$H66*($G$14<=$E66)*($G$15>=$F66),$H66*($G$14<=$F66)*($G$15>=$E66))
U66: @IF($A66=1,$H66*($G$15<=$E66)*($G$16>=$F66),$H66*($G$15<=$F66)*($G$16>=$E66))
V66: @IF($A66=1,$H66*($G$16<=$E66)*($G$17>=$F66),$H66*($G$16<=$F66)*($G$17>=$E66))
W66: @IF($A66=1,$H66*($G$17<=$E66)*($G$18>=$F66),$H66*($G$17<=$F66)*($G$18>=$E66))
X66: @IF($A66=1,$H66*($G$18<=$E66)*($G$19>=$F66),$H66*($G$18<=$F66)*($G$19>=$E66))
Y66: @IF($A66=1,$H66*($G$19<=$E66)*($G$20>=$F66),$H66*($G$19<=$F66)*($G$20>=$E66))
Z66: @IF($A66=1,$H66*($G$20<=$E66)*($G$21>=$F66),$H66*($G$20<=$F66)*($G$21>=$E66))
AA66: @IF($A66=1,$H66*($G$21<=$E66)*($G$22>=$F66),$H66*($G$21<=$F66)*($G$22>=$E66))
AB66: @IF($A66=1,$H66*($G$22<=$E66)*($G$23>=$F66),$H66*($G$22<=$F66)*($G$23>=$E66))
AC66: @IF($A66=1,$H66*($G$23<=$E66)*($G$24>=$F66),$H66*($G$23<=$F66)*($G$24>=$E66))
AD66: @IF($A66=1,$H66*($G$24<=$E66)*($G$25>=$F66),$H66*($G$24<=$F66)*($G$25>=$E66))
AE66: @IF($A66=1,$H66*($G$25<=$E66)*($G$26>=$F66),$H66*($G$25<=$F66)*($G$26>=$E66))
AF66: @IF($A66=1,$H66*($G$26<=$E66)*($G$27>=$F66),$H66*($G$26<=$F66)*($G$27>=$E66))
AG66: @IF($A66=1,$H66*($G$27<=$E66)*($G$28>=$F66),$H66*($G$27<=$F66)*($G$28>=$E66))
```

```
AH66: @IF($A66=1,$H66*($G$28<=$E66)*($G$29>=$F66),$H66*($G$28<=$F66)*($G$29>=$E66))
AI66: @IF($A66=1,$H66*($G$29<=$E66)*($G$30>=$F66),$H66*($G$29<=$F66)*($G$30>=$E66))
AJ66: @IF($A66=1,$H66*($G$30<=$E66)*($G$31>=$F66),$H66*($G$30<=$F66)*($G$31>=$E66))
AK66: @IF($A66=1,$H66*($G$31<=$E66)*($G$32>=$F66),$H66*($G$31<=$F66)*($G$32>=$E66))
AL66: @IF($A66=1,$H66*($G$32<=$E66)*($G$33>=$F66),$H66*($G$32<=$F66)*($G$33>=$E66))
AM66: @IF($A66=1,$H66*($G$33<=$E66)*($G$34>=$F66),$H66*($G$33<=$F66)*($G$34>=$E66))
AN66: @IF($A66=1,$H66*($G$34<=$E66)*($G$35>=$F66),$H66*($G$34<=$F66)*($G$35>=$E66))
AO66: @IF($A66=1,$H66*($G$35<=$E66)*($G$36>=$F66),$H66*($G$35<=$F66)*($G$36>=$E66))
AP66: @IF($A66=1,$H66*($G$36<=$E66)*($G$37>=$F66),$H66*($G$36<=$F66)*($G$37>=$E66))
AQ66: @IF($A66=1,$H66*($G$37<=$E66)*($G$38>=$F66),$H66*($G$37<=$F66)*($G$38>=$E66))
AR66: @IF($A66=1,$H66*($G$38<=$E66)*($G$39>=$F66),$H66*($G$38<=$F66)*($G$39>=$E66))
AS66: @IF($A66=1,$H66*($G$39<=$E66)*($G$40>=$F66),$H66*($G$39<=$F66)*($G$40>=$E66))
AT66: @IF($A66=1,$H66*($G$40<=$E66)*($G$41>=$F66),$H66*($G$40<=$F66)*($G$41>=$E66))
AU66: @IF($A66=1,$H66*($G$41<=$E66)*($G$42>=$F66),$H66*($G$41<=$F66)*($G$42>=$E66))
AV66: @IF($A66=1,$H66*($G$42<=$E66)*($G$43>=$F66),$H66*($G$42<=$F66)*($G$43>=$E66))
AW66: @IF($A66=1,$H66*($G$43<=$E66)*($G$44>=$F66),$H66*($G$43<=$F66)*($G$44>=$E66))
AX66: @IF($A66=1,$H66*($G$44<=$E66)*($G$45>=$F66),$H66*($G$44<=$F66)*($G$45>=$E66))
AY66: @IF($A66=1,$H66*($G$45<=$E66)*($G$46>=$F66),$H66*($G$45<=$F66)*($G$46>=$E66))
AZ66: @IF($A66=1,$H66*($G$46<=$E66)*($G$47>=$F66),$H66*($G$46<=$F66)*($G$47>=$E66))
BA66: @IF($A66=1,$H66*($G$47<=$E66)*($G$48>=$F66),$H66*($G$47<=$F66)*($G$48>=$E66))
BB66: @IF($A66=1,$H66*($G$48<=$E66)*($G$49>=$F66),$H66*($G$48<=$F66)*($G$49>=$E66))
BC66: @IF($A66=1,$H66*($G$49<=$E66)*($G$50>=$F66),$H66*($G$49<=$F66)*($G$50>=$E66))
BD66: @IF($A66=1,$H66*($G$50<=$E66)*($G$51>=$F66),$H66*($G$50<=$F66)*($G$51>=$E66))
BE66: @IF($A66=1,$H66*($G$51<=$E66)*($G$52>=$F66),$H66*($G$51<=$F66)*($G$52>=$E66))
BF66: @IF($A66=1,$H66*($G$52<=$E66)*($G$53>=$F66),$H66*($G$52<=$F66)*($G$53>=$E66))
BG66: @IF($A66=1,$H66*($G$53<=$E66)*($G$54>=$F66),$H66*($G$53<=$F66)*($G$54>=$E66))
BH66: @IF($A66=1,$H66*($G$54<=$E66)*($G$55>=$F66),$H66*($G$54<=$F66)*($G$55>=$E66))
BI66: @IF($A66=1,$H66*($G$55<=$E66)*($G$56>=$F66),$H66*($G$55<=$F66)*($G$56>=$E66))
BJ66: @IF($A66=1,$H66*($G$56<=$E66)*($G$57>=$F66),$H66*($G$56<=$F66)*($G$57>=$E66))
BK66: @IF($A66=1,$H66*($G$57<=$E66)*($G$58>=$F66),$H66*($G$57<=$F66)*($G$58>=$E66))
BL66: @IF($A66=1,$H66*($G$58<=$E66)*($G$59>=$F66),$H66*($G$58<=$F66)*($G$59>=$E66))
BM66: @IF($A66=1,$H66*($G$59<=$E66)*($G$60>=$F66),$H66*($G$59<=$F66)*($G$60>=$E66))
BN66: @IF($A66=1,$H66*($G$60<=$E66)*($G$61>=$F66),$H66*($G$60<=$F66)*($G$61>=$E66))
BO66: @IF($A66=1,$H66*($G$61<=$E66)*($G$62>=$F66),$H66*($G$61<=$F66)*($G$62>=$E66))
BP66: @IF($A66=1,$H66*($G$62<=$E66)*($G$63>=$F66),$H66*($G$62<=$F66)*($G$63>=$E66))
BQ66: @IF($A66=1,$H66*($G$63<=$E66)*($G$64>=$F66),$H66*($G$63<=$F66)*($G$64>=$E66))
BR66: @IF($A66=1,$H66*($G$64<=$E66)*($G$65>=$F66),$H66*($G$64<=$F66)*($G$65>=$E66))
BS66: @IF($A66=1,$H66*($G$65<=$E66)*($G$66>=$F66),$H66*($G$65<=$F66)*($G$66>=$E66))
BT66: @IF($A66=1,$H66*($G$66<=$E66)*($G$67>=$F66),$H66*($G$66<=$F66)*($G$67>=$E66))
BU66: @IF($A66=1,$H66*($G$67<=$E66)*($G$68>=$F66),$H66*($G$67<=$F66)*($G$68>=$E66))
BV66: @IF($A66=1,$H66*($G$68<=$E66)*($G$69>=$F66),$H66*($G$68<=$F66)*($G$69>=$E66))
BW66: @IF($A66=1,$H66*($G$69<=$E66)*($G$70>=$F66),$H66*($G$69<=$F66)*($G$70>=$E66))
BX66: @IF($A66=1,$H66*($G$70<=$E66)*($G$71>=$F66),$H66*($G$70<=$F66)*($G$71>=$E66))
BY66: @IF($A66=1,$H66*($G$71<=$E66)*($G$72>=$F66),$H66*($G$71<=$F66)*($G$72>=$E66))
BZ66: @IF($A66=1,$H66*($G$72<=$E66)*($G$73>=$F66),$H66*($G$72<=$F66)*($G$73>=$E66))
P67: @IF($A67=1,$H67*($G$10<=$E67)*($G$11>=$F67),$H67*($G$10<=$F67)*($G$11>=$E67))
Q67: @IF($A67=1,$H67*($G$11<=$E67)*($G$12>=$F67),$H67*($G$11<=$F67)*($G$12>=$E67))
R67: @IF($A67=1,$H67*($G$12<=$E67)*($G$13>=$F67),$H67*($G$12<=$F67)*($G$13>=$E67))
S67: @IF($A67=1,$H67*($G$13<=$E67)*($G$14>=$F67),$H67*($G$13<=$F67)*($G$14>=$E67))
T67: @IF($A67=1,$H67*($G$14<=$E67)*($G$15>=$F67),$H67*($G$14<=$F67)*($G$15>=$E67))
U67: @IF($A67=1,$H67*($G$15<=$E67)*($G$16>=$F67),$H67*($G$15<=$F67)*($G$16>=$E67))
V67: @IF($A67=1,$H67*($G$16<=$E67)*($G$17>=$F67),$H67*($G$16<=$F67)*($G$17>=$E67))
W67: @IF($A67=1,$H67*($G$17<=$E67)*($G$18>=$F67),$H67*($G$17<=$F67)*($G$18>=$E67))
X67: @IF($A67=1,$H67*($G$18<=$E67)*($G$19>=$F67),$H67*($G$18<=$F67)*($G$19>=$E67))
Y67: @IF($A67=1,$H67*($G$19<=$E67)*($G$20>=$F67),$H67*($G$19<=$F67)*($G$20>=$E67))
Z67: @IF($A67=1,$H67*($G$20<=$E67)*($G$21>=$F67),$H67*($G$20<=$F67)*($G$21>=$E67))
```

```
AA67: @IF($A67=1,$H67*($G$21<=$E67)*($G$22>=$F67),$H67*($G$21<=$F67)*($G$22>=$E67))
AB67: @IF($A67=1,$H67*($G$22<=$E67)*($G$23>=$F67),$H67*($G$22<=$F67)*($G$23>=$E67))
AC67: @IF($A67=1,$H67*($G$23<=$E67)*($G$24>=$F67),$H67*($G$23<=$F67)*($G$24>=$E67))
AD67: @IF($A67=1,$H67*($G$24<=$E67)*($G$25>=$F67),$H67*($G$24<=$F67)*($G$25>=$E67))
AE67: @IF($A67=1,$H67*($G$25<=$E67)*($G$26>=$F67),$H67*($G$25<=$F67)*($G$26>=$E67))
AF67: @IF($A67=1,$H67*($G$26<=$E67)*($G$27>=$F67),$H67*($G$26<=$F67)*($G$27>=$E67))
AG67: @IF($A67=1,$H67*($G$27<=$E67)*($G$28>=$F67),$H67*($G$27<=$F67)*($G$28>=$E67))
AH67: @IF($A67=1,$H67*($G$28<=$E67)*($G$29>=$F67),$H67*($G$28<=$F67)*($G$29>=$E67))
AI67: @IF($A67=1,$H67*($G$29<=$E67)*($G$30>=$F67),$H67*($G$29<=$F67)*($G$30>=$E67))
AJ67: @IF($A67=1,$H67*($G$30<=$E67)*($G$31>=$F67),$H67*($G$30<=$F67)*($G$31>=$E67))
AK67: @IF($A67=1,$H67*($G$31<=$E67)*($G$32>=$F67),$H67*($G$31<=$F67)*($G$32>=$E67))
AL67: @IF($A67=1,$H67*($G$32<=$E67)*($G$33>=$F67),$H67*($G$32<=$F67)*($G$33>=$E67))
AM67: @IF($A67=1,$H67*($G$33<=$E67)*($G$34>=$F67),$H67*($G$33<=$F67)*($G$34>=$E67))
AN67: @IF($A67=1,$H67*($G$34<=$E67)*($G$35>=$F67),$H67*($G$34<=$F67)*($G$35>=$E67))
AO67: @IF($A67=1,$H67*($G$35<=$E67)*($G$36>=$F67),$H67*($G$35<=$F67)*($G$36>=$E67))
AP67: @IF($A67=1,$H67*($G$36<=$E67)*($G$37>=$F67),$H67*($G$36<=$F67)*($G$37>=$E67))
AQ67: @IF($A67=1,$H67*($G$37<=$E67)*($G$38>=$F67),$H67*($G$37<=$F67)*($G$38>=$E67))
AR67: @IF($A67=1,$H67*($G$38<=$E67)*($G$39>=$F67),$H67*($G$38<=$F67)*($G$39>=$E67))
AS67: @IF($A67=1,$H67*($G$39<=$E67)*($G$40>=$F67),$H67*($G$39<=$F67)*($G$40>=$E67))
AT67: @IF($A67=1,$H67*($G$40<=$E67)*($G$41>=$F67),$H67*($G$40<=$F67)*($G$41>=$E67))
AU67: @IF($A67=1,$H67*($G$41<=$E67)*($G$42>=$F67),$H67*($G$41<=$F67)*($G$42>=$E67))
AV67: @IF($A67=1,$H67*($G$42<=$E67)*($G$43>=$F67),$H67*($G$42<=$F67)*($G$43>=$E67))
AW67: @IF($A67=1,$H67*($G$43<=$E67)*($G$44>=$F67),$H67*($G$43<=$F67)*($G$44>=$E67))
AX67: @IF($A67=1,$H67*($G$44<=$E67)*($G$45>=$F67),$H67*($G$44<=$F67)*($G$45>=$E67))
AY67: @IF($A67=1,$H67*($G$45<=$E67)*($G$46>=$F67),$H67*($G$45<=$F67)*($G$46>=$E67))
AZ67: @IF($A67=1,$H67*($G$46<=$E67)*($G$47>=$F67),$H67*($G$46<=$F67)*($G$47>=$E67))
BA67: @IF($A67=1,$H67*($G$47<=$E67)*($G$48>=$F67),$H67*($G$47<=$F67)*($G$48>=$E67))
BB67: @IF($A67=1,$H67*($G$48<=$E67)*($G$49>=$F67),$H67*($G$48<=$F67)*($G$49>=$E67))
BC67: @IF($A67=1,$H67*($G$49<=$E67)*($G$50>=$F67),$H67*($G$49<=$F67)*($G$50>=$E67))
BD67: @IF($A67=1,$H67*($G$50<=$E67)*($G$51>=$F67),$H67*($G$50<=$F67)*($G$51>=$E67))
BE67: @IF($A67=1,$H67*($G$51<=$E67)*($G$52>=$F67),$H67*($G$51<=$F67)*($G$52>=$E67))
BF67: @IF($A67=1,$H67*($G$52<=$E67)*($G$53>=$F67),$H67*($G$52<=$F67)*($G$53>=$E67))
BG67: @IF($A67=1,$H67*($G$53<=$E67)*($G$54>=$F67),$H67*($G$53<=$F67)*($G$54>=$E67))
BH67: @IF($A67=1,$H67*($G$54<=$E67)*($G$55>=$F67),$H67*($G$54<=$F67)*($G$55>=$E67))
BI67: @IF($A67=1,$H67*($G$55<=$E67)*($G$56>=$F67),$H67*($G$55<=$F67)*($G$56>=$E67))
BJ67: @IF($A67=1,$H67*($G$56<=$E67)*($G$57>=$F67),$H67*($G$56<=$F67)*($G$57>=$E67))
BK67: @IF($A67=1,$H67*($G$57<=$E67)*($G$58>=$F67),$H67*($G$57<=$F67)*($G$58>=$E67))
BL67: @IF($A67=1,$H67*($G$58<=$E67)*($G$59>=$F67),$H67*($G$58<=$F67)*($G$59>=$E67))
BM67: @IF($A67=1,$H67*($G$59<=$E67)*($G$60>=$F67),$H67*($G$59<=$F67)*($G$60>=$E67))
BN67: @IF($A67=1,$H67*($G$60<=$E67)*($G$61>=$F67),$H67*($G$60<=$F67)*($G$61>=$E67))
BO67: @IF($A67=1,$H67*($G$61<=$E67)*($G$62>=$F67),$H67*($G$61<=$F67)*($G$62>=$E67))
BP67: @IF($A67=1,$H67*($G$62<=$E67)*($G$63>=$F67),$H67*($G$62<=$F67)*($G$63>=$E67))
BQ67: @IF($A67=1,$H67*($G$63<=$E67)*($G$64>=$F67),$H67*($G$63<=$F67)*($G$64>=$E67))
BR67: @IF($A67=1,$H67*($G$64<=$E67)*($G$65>=$F67),$H67*($G$64<=$F67)*($G$65>=$E67))
BS67: @IF($A67=1,$H67*($G$65<=$E67)*($G$66>=$F67),$H67*($G$65<=$F67)*($G$66>=$E67))
BT67: @IF($A67=1,$H67*($G$66<=$E67)*($G$67>=$F67),$H67*($G$66<=$F67)*($G$67>=$E67))
BU67: @IF($A67=1,$H67*($G$67<=$E67)*($G$68>=$F67),$H67*($G$67<=$F67)*($G$68>=$E67))
BV67: @IF($A67=1,$H67*($G$68<=$E67)*($G$69>=$F67),$H67*($G$68<=$F67)*($G$69>=$E67))
BW67: @IF($A67=1,$H67*($G$69<=$E67)*($G$70>=$F67),$H67*($G$69<=$F67)*($G$70>=$E67))
BX67: @IF($A67=1,$H67*($G$70<=$E67)*($G$71>=$F67),$H67*($G$70<=$F67)*($G$71>=$E67))
BY67: @IF($A67=1,$H67*($G$71<=$E67)*($G$72>=$F67),$H67*($G$71<=$F67)*($G$72>=$E67))
BZ67: @IF($A67=1,$H67*($G$72<=$E67)*($G$73>=$F67),$H67*($G$72<=$F67)*($G$73>=$E67))
P68: @IF($A68=1,$H68*($G$10<=$E68)*($G$11>=$F68),$H68*($G$10<=$F68)*($G$11>=$E68))
Q68: @IF($A68=1,$H68*($G$11<=$E68)*($G$12>=$F68),$H68*($G$11<=$F68)*($G$12>=$E68))
R68: @IF($A68=1,$H68*($G$12<=$E68)*($G$13>=$F68),$H68*($G$12<=$F68)*($G$13>=$E68))
S68: @IF($A68=1,$H68*($G$13<=$E68)*($G$14>=$F68),$H68*($G$13<=$F68)*($G$14>=$E68))
```

```
T68: @IF($A68=1,$H68*($G$14<=$E68)*($G$15>=$F68),$H68*($G$14<=$F68)*($G$15>=$E68))
U68: @IF($A68=1,$H68*($G$15<=$E68)*($G$16>=$F68),$H68*($G$15<=$F68)*($G$16>=$E68))
V68: @IF($A68=1,$H68*($G$16<=$E68)*($G$17>=$F68),$H68*($G$16<=$F68)*($G$17>=$E68))
W68: @IF($A68=1,$H68*($G$17<=$E68)*($G$18>=$F68),$H68*($G$17<=$F68)*($G$18>=$E68))
X68: @IF($A68=1,$H68*($G$18<=$E68)*($G$19>=$F68),$H68*($G$18<=$F68)*($G$19>=$E68))
Y68: @IF($A68=1,$H68*($G$19<=$E68)*($G$20>=$F68),$H68*($G$19<=$F68)*($G$20>=$E68))
Z68: @IF($A68=1,$H68*($G$20<=$E68)*($G$21>=$F68),$H68*($G$20<=$F68)*($G$21>=$E68))
AA68: @IF($A68=1,$H68*($G$21<=$E68)*($G$22>=$F68),$H68*($G$21<=$F68)*($G$22>=$E68))
AB68: @IF($A68=1,$H68*($G$22<=$E68)*($G$23>=$F68),$H68*($G$22<=$F68)*($G$23>=$E68))
AC68: @IF($A68=1,$H68*($G$23<=$E68)*($G$24>=$F68),$H68*($G$23<=$F68)*($G$24>=$E68))
AD68: @IF($A68=1,$H68*($G$24<=$E68)*($G$25>=$F68),$H68*($G$24<=$F68)*($G$25>=$E68))
AE68: @IF($A68=1,$H68*($G$25<=$E68)*($G$26>=$F68),$H68*($G$25<=$F68)*($G$26>=$E68))
AF68: @IF($A68=1,$H68*($G$26<=$E68)*($G$27>=$F68),$H68*($G$26<=$F68)*($G$27>=$E68))
AG68: @IF($A68=1,$H68*($G$27<=$E68)*($G$28>=$F68),$H68*($G$27<=$F68)*($G$28>=$E68))
AH68: @IF($A68=1,$H68*($G$28<=$E68)*($G$29>=$F68),$H68*($G$28<=$F68)*($G$29>=$E68))
AI68: @IF($A68=1,$H68*($G$29<=$E68)*($G$30>=$F68),$H68*($G$29<=$F68)*($G$30>=$E68))
AJ68: @IF($A68=1,$H68*($G$30<=$E68)*($G$31>=$F68),$H68*($G$30<=$F68)*($G$31>=$E68))
AK68: @IF($A68=1,$H68*($G$31<=$E68)*($G$32>=$F68),$H68*($G$31<=$F68)*($G$32>=$E68))
AL68: @IF($A68=1,$H68*($G$32<=$E68)*($G$33>=$F68),$H68*($G$32<=$F68)*($G$33>=$E68))
AM68: @IF($A68=1,$H68*($G$33<=$E68)*($G$34>=$F68),$H68*($G$33<=$F68)*($G$34>=$E68))
AN68: @IF($A68=1,$H68*($G$34<=$E68)*($G$35>=$F68),$H68*($G$34<=$F68)*($G$35>=$E68))
AO68: @IF($A68=1,$H68*($G$35<=$E68)*($G$36>=$F68),$H68*($G$35<=$F68)*($G$36>=$E68))
AP68: @IF($A68=1,$H68*($G$36<=$E68)*($G$37>=$F68),$H68*($G$36<=$F68)*($G$37>=$E68))
AQ68: @IF($A68=1,$H68*($G$37<=$E68)*($G$38>=$F68),$H68*($G$37<=$F68)*($G$38>=$E68))
AR68: @IF($A68=1,$H68*($G$38<=$E68)*($G$39>=$F68),$H68*($G$38<=$F68)*($G$39>=$E68))
AS68: @IF($A68=1,$H68*($G$39<=$E68)*($G$40>=$F68),$H68*($G$39<=$F68)*($G$40>=$E68))
AT68: @IF($A68=1,$H68*($G$40<=$E68)*($G$41>=$F68),$H68*($G$40<=$F68)*($G$41>=$E68))
AU68: @IF($A68=1,$H68*($G$41<=$E68)*($G$42>=$F68),$H68*($G$41<=$F68)*($G$42>=$E68))
AV68: @IF($A68=1,$H68*($G$42<=$E68)*($G$43>=$F68),$H68*($G$42<=$F68)*($G$43>=$E68))
AW68: @IF($A68=1,$H68*($G$43<=$E68)*($G$44>=$F68),$H68*($G$43<=$F68)*($G$44>=$E68))
AX68: @IF($A68=1,$H68*($G$44<=$E68)*($G$45>=$F68),$H68*($G$44<=$F68)*($G$45>=$E68))
AY68: @IF($A68=1,$H68*($G$45<=$E68)*($G$46>=$F68),$H68*($G$45<=$F68)*($G$46>=$E68))
AZ68: @IF($A68=1,$H68*($G$46<=$E68)*($G$47>=$F68),$H68*($G$46<=$F68)*($G$47>=$E68))
BA68: @IF($A68=1,$H68*($G$47<=$E68)*($G$48>=$F68),$H68*($G$47<=$F68)*($G$48>=$E68))
BB68: @IF($A68=1,$H68*($G$48<=$E68)*($G$49>=$F68),$H68*($G$48<=$F68)*($G$49>=$E68))
BC68: @IF($A68=1,$H68*($G$49<=$E68)*($G$50>=$F68),$H68*($G$49<=$F68)*($G$50>=$E68))
BD68: @IF($A68=1,$H68*($G$50<=$E68)*($G$51>=$F68),$H68*($G$50<=$F68)*($G$51>=$E68))
BE68: @IF($A68=1,$H68*($G$51<=$E68)*($G$52>=$F68),$H68*($G$51<=$F68)*($G$52>=$E68))
BF68: @IF($A68=1,$H68*($G$52<=$E68)*($G$53>=$F68),$H68*($G$52<=$F68)*($G$53>=$E68))
BG68: @IF($A68=1,$H68*($G$53<=$E68)*($G$54>=$F68),$H68*($G$53<=$F68)*($G$54>=$E68))
BH68: @IF($A68=1,$H68*($G$54<=$E68)*($G$55>=$F68),$H68*($G$54<=$F68)*($G$55>=$E68))
BI68: @IF($A68=1,$H68*($G$55<=$E68)*($G$56>=$F68),$H68*($G$55<=$F68)*($G$56>=$E68))
BJ68: @IF($A68=1,$H68*($G$56<=$E68)*($G$57>=$F68),$H68*($G$56<=$F68)*($G$57>=$E68))
BK68: @IF($A68=1,$H68*($G$57<=$E68)*($G$58>=$F68),$H68*($G$57<=$F68)*($G$58>=$E68))
BL68: @IF($A68=1,$H68*($G$58<=$E68)*($G$59>=$F68),$H68*($G$58<=$F68)*($G$59>=$E68))
BM68: @IF($A68=1,$H68*($G$59<=$E68)*($G$60>=$F68),$H68*($G$59<=$F68)*($G$60>=$E68))
BN68: @IF($A68=1,$H68*($G$60<=$E68)*($G$61>=$F68),$H68*($G$60<=$F68)*($G$61>=$E68))
BO68: @IF($A68=1,$H68*($G$61<=$E68)*($G$62>=$F68),$H68*($G$61<=$F68)*($G$62>=$E68))
BP68: @IF($A68=1,$H68*($G$62<=$E68)*($G$63>=$F68),$H68*($G$62<=$F68)*($G$63>=$E68))
BQ68: @IF($A68=1,$H68*($G$63<=$E68)*($G$64>=$F68),$H68*($G$63<=$F68)*($G$64>=$E68))
BR68: @IF($A68=1,$H68*($G$64<=$E68)*($G$65>=$F68),$H68*($G$64<=$F68)*($G$65>=$E68))
BS68: @IF($A68=1,$H68*($G$65<=$E68)*($G$66>=$F68),$H68*($G$65<=$F68)*($G$66>=$E68))
BT68: @IF($A68=1,$H68*($G$66<=$E68)*($G$67>=$F68),$H68*($G$66<=$F68)*($G$67>=$E68))
BU68: @IF($A68=1,$H68*($G$67<=$E68)*($G$68>=$F68),$H68*($G$67<=$F68)*($G$68>=$E68))
BV68: @IF($A68=1,$H68*($G$68<=$E68)*($G$69>=$F68),$H68*($G$68<=$F68)*($G$69>=$E68))
BW68: @IF($A68=1,$H68*($G$69<=$E68)*($G$70>=$F68),$H68*($G$69<=$F68)*($G$70>=$E68))
```

```
BX68: @IF($A68=1,$H68*($G$70<=$E68)*($G$71>=$F68),$H68*($G$70<=$F68)*($G$71>=$E68))
BY68: @IF($A68=1,$H68*($G$71<=$E68)*($G$72>=$F68),$H68*($G$71<=$F68)*($G$72>=$E68))
BZ68: @IF($A68=1,$H68*($G$72<=$E68)*($G$73>=$F68),$H68*($G$72<=$F68)*($G$73>=$E68))
P69: @IF($A69=1,$H69*($G$10<=$E69)*($G$11>=$F69),$H69*($G$10<=$F69)*($G$11>=$E69))
Q69: @IF($A69=1,$H69*($G$11<=$E69)*($G$12>=$F69),$H69*($G$11<=$F69)*($G$12>=$E69))
R69: @IF($A69=1,$H69*($G$12<=$E69)*($G$13>=$F69),$H69*($G$12<=$F69)*($G$13>=$E69))
S69: @IF($A69=1,$H69*($G$13<=$E69)*($G$14>=$F69),$H69*($G$13<=$F69)*($G$14>=$E69))
T69: @IF($A69=1,$H69*($G$14<=$E69)*($G$15>=$F69),$H69*($G$14<=$F69)*($G$15>=$E69))
U69: @IF($A69=1,$H69*($G$15<=$E69)*($G$16>=$F69),$H69*($G$15<=$F69)*($G$16>=$E69))
V69: @IF($A69=1,$H69*($G$16<=$E69)*($G$17>=$F69),$H69*($G$16<=$F69)*($G$17>=$E69))
W69: @IF($A69=1,$H69*($G$17<=$E69)*($G$18>=$F69),$H69*($G$17<=$F69)*($G$18>=$E69))
X69: @IF($A69=1,$H69*($G$18<=$E69)*($G$19>=$F69),$H69*($G$18<=$F69)*($G$19>=$E69))
Y69: @IF($A69=1,$H69*($G$19<=$E69)*($G$20>=$F69),$H69*($G$19<=$F69)*($G$20>=$E69))
Z69: @IF($A69=1,$H69*($G$20<=$E69)*($G$21>=$F69),$H69*($G$20<=$F69)*($G$21>=$E69))
AA69: @IF($A69=1,$H69*($G$21<=$E69)*($G$22>=$F69),$H69*($G$21<=$F69)*($G$22>=$E69))
AB69: @IF($A69=1,$H69*($G$22<=$E69)*($G$23>=$F69),$H69*($G$22<=$F69)*($G$23>=$E69))
AC69: @IF($A69=1,$H69*($G$23<=$E69)*($G$24>=$F69),$H69*($G$23<=$F69)*($G$24>=$E69))
AD69: @IF($A69=1,$H69*($G$24<=$E69)*($G$25>=$F69),$H69*($G$24<=$F69)*($G$25>=$E69))
AE69: @IF($A69=1,$H69*($G$25<=$E69)*($G$26>=$F69),$H69*($G$25<=$F69)*($G$26>=$E69))
AF69: @IF($A69=1,$H69*($G$26<=$E69)*($G$27>=$F69),$H69*($G$26<=$F69)*($G$27>=$E69))
AG69: @IF($A69=1,$H69*($G$27<=$E69)*($G$28>=$F69),$H69*($G$27<=$F69)*($G$28>=$E69))
AH69: @IF($A69=1,$H69*($G$28<=$E69)*($G$29>=$F69),$H69*($G$28<=$F69)*($G$29>=$E69))
AI69: @IF($A69=1,$H69*($G$29<=$E69)*($G$30>=$F69),$H69*($G$29<=$F69)*($G$30>=$E69))
AJ69: @IF($A69=1,$H69*($G$30<=$E69)*($G$31>=$F69),$H69*($G$30<=$F69)*($G$31>=$E69))
AK69: @IF($A69=1,$H69*($G$31<=$E69)*($G$32>=$F69),$H69*($G$31<=$F69)*($G$32>=$E69))
AL69: @IF($A69=1,$H69*($G$32<=$E69)*($G$33>=$F69),$H69*($G$32<=$F69)*($G$33>=$E69))
AM69: @IF($A69=1,$H69*($G$33<=$E69)*($G$34>=$F69),$H69*($G$33<=$F69)*($G$34>=$E69))
AN69: @IF($A69=1,$H69*($G$34<=$E69)*($G$35>=$F69),$H69*($G$34<=$F69)*($G$35>=$E69))
AO69: @IF($A69=1,$H69*($G$35<=$E69)*($G$36>=$F69),$H69*($G$35<=$F69)*($G$36>=$E69))
AP69: @IF($A69=1,$H69*($G$36<=$E69)*($G$37>=$F69),$H69*($G$36<=$F69)*($G$37>=$E69))
AQ69: @IF($A69=1,$H69*($G$37<=$E69)*($G$38>=$F69),$H69*($G$37<=$F69)*($G$38>=$E69))
AR69: @IF($A69=1,$H69*($G$38<=$E69)*($G$39>=$F69),$H69*($G$38<=$F69)*($G$39>=$E69))
AS69: @IF($A69=1,$H69*($G$39<=$E69)*($G$40>=$F69),$H69*($G$39<=$F69)*($G$40>=$E69))
AT69: @IF($A69=1,$H69*($G$40<=$E69)*($G$41>=$F69),$H69*($G$40<=$F69)*($G$41>=$E69))
AU69: @IF($A69=1,$H69*($G$41<=$E69)*($G$42>=$F69),$H69*($G$41<=$F69)*($G$42>=$E69))
AV69: @IF($A69=1,$H69*($G$42<=$E69)*($G$43>=$F69),$H69*($G$42<=$F69)*($G$43>=$E69))
AW69: @IF($A69=1,$H69*($G$43<=$E69)*($G$44>=$F69),$H69*($G$43<=$F69)*($G$44>=$E69))
AX69: @IF($A69=1,$H69*($G$44<=$E69)*($G$45>=$F69),$H69*($G$44<=$F69)*($G$45>=$E69))
AY69: @IF($A69=1,$H69*($G$45<=$E69)*($G$46>=$F69),$H69*($G$45<=$F69)*($G$46>=$E69))
AZ69: @IF($A69=1,$H69*($G$46<=$E69)*($G$47>=$F69),$H69*($G$46<=$F69)*($G$47>=$E69))
BA69: @IF($A69=1,$H69*($G$47<=$E69)*($G$48>=$F69),$H69*($G$47<=$F69)*($G$48>=$E69))
BB69: @IF($A69=1,$H69*($G$48<=$E69)*($G$49>=$F69),$H69*($G$48<=$F69)*($G$49>=$E69))
BC69: @IF($A69=1,$H69*($G$49<=$E69)*($G$50>=$F69),$H69*($G$49<=$F69)*($G$50>=$E69))
BD69: @IF($A69=1,$H69*($G$50<=$E69)*($G$51>=$F69),$H69*($G$50<=$F69)*($G$51>=$E69))
BE69: @IF($A69=1,$H69*($G$51<=$E69)*($G$52>=$F69),$H69*($G$51<=$F69)*($G$52>=$E69))
BF69: @IF($A69=1,$H69*($G$52<=$E69)*($G$53>=$F69),$H69*($G$52<=$F69)*($G$53>=$E69))
BG69: @IF($A69=1,$H69*($G$53<=$E69)*($G$54>=$F69),$H69*($G$53<=$F69)*($G$54>=$E69))
BH69: @IF($A69=1,$H69*($G$54<=$E69)*($G$55>=$F69),$H69*($G$54<=$F69)*($G$55>=$E69))
BI69: @IF($A69=1,$H69*($G$55<=$E69)*($G$56>=$F69),$H69*($G$55<=$F69)*($G$56>=$E69))
BJ69: @IF($A69=1,$H69*($G$56<=$E69)*($G$57>=$F69),$H69*($G$56<=$F69)*($G$57>=$E69))
BK69: @IF($A69=1,$H69*($G$57<=$E69)*($G$58>=$F69),$H69*($G$57<=$F69)*($G$58>=$E69))
BL69: @IF($A69=1,$H69*($G$58<=$E69)*($G$59>=$F69),$H69*($G$58<=$F69)*($G$59>=$E69))
BM69: @IF($A69=1,$H69*($G$59<=$E69)*($G$60>=$F69),$H69*($G$59<=$F69)*($G$60>=$E69))
BN69: @IF($A69=1,$H69*($G$60<=$E69)*($G$61>=$F69),$H69*($G$60<=$F69)*($G$61>=$E69))
BO69: @IF($A69=1,$H69*($G$61<=$E69)*($G$62>=$F69),$H69*($G$61<=$F69)*($G$62>=$E69))
BP69: @IF($A69=1,$H69*($G$62<=$E69)*($G$63>=$F69),$H69*($G$62<=$F69)*($G$63>=$E69))
```

```
BQ69: @IF($A69=1,$H69*($G$63<=$E69)*($G$64>=$F69),$H69*($G$63<=$F69)*($G$64>=$E69))
BR69: @IF($A69=1,$H69*($G$64<=$E69)*($G$65>=$F69),$H69*($G$64<=$F69)*($G$65>=$E69))
BS69: @IF($A69=1,$H69*($G$65<=$E69)*($G$66>=$F69),$H69*($G$65<=$F69)*($G$66>=$E69))
BT69: @IF($A69=1,$H69*($G$66<=$E69)*($G$67>=$F69),$H69*($G$66<=$F69)*($G$67>=$E69))
BU69: @IF($A69=1,$H69*($G$67<=$E69)*($G$68>=$F69),$H69*($G$67<=$F69)*($G$68>=$E69))
BV69: @IF($A69=1,$H69*($G$68<=$E69)*($G$69>=$F69),$H69*($G$68<=$F69)*($G$69>=$E69))
BW69: @IF($A69=1,$H69*($G$69<=$E69)*($G$70>=$F69),$H69*($G$69<=$F69)*($G$70>=$E69))
BX69: @IF($A69=1,$H69*($G$70<=$E69)*($G$71>=$F69),$H69*($G$70<=$F69)*($G$71>=$E69))
BY69: @IF($A69=1,$H69*($G$71<=$E69)*($G$72>=$F69),$H69*($G$71<=$F69)*($G$72>=$E69))
BZ69: @IF($A69=1,$H69*($G$72<=$E69)*($G$73>=$F69),$H69*($G$72<=$F69)*($G$73>=$E69))
P70: @IF($A70=1,$H70*($G$10<=$E70)*($G$11>=$F70),$H70*($G$10<=$F70)*($G$11>=$E70))
Q70: @IF($A70=1,$H70*($G$11<=$E70)*($G$12>=$F70),$H70*($G$11<=$F70)*($G$12>=$E70))
R70: @IF($A70=1,$H70*($G$12<=$E70)*($G$13>=$F70),$H70*($G$12<=$F70)*($G$13>=$E70))
S70: @IF($A70=1,$H70*($G$13<=$E70)*($G$14>=$F70),$H70*($G$13<=$F70)*($G$14>=$E70))
T70: @IF($A70=1,$H70*($G$14<=$E70)*($G$15>=$F70),$H70*($G$14<=$F70)*($G$15>=$E70))
U70: @IF($A70=1,$H70*($G$15<=$E70)*($G$16>=$F70),$H70*($G$15<=$F70)*($G$16>=$E70))
V70: @IF($A70=1,$H70*($G$16<=$E70)*($G$17>=$F70),$H70*($G$16<=$F70)*($G$17>=$E70))
W70: @IF($A70=1,$H70*($G$17<=$E70)*($G$18>=$F70),$H70*($G$17<=$F70)*($G$18>=$E70))
X70: @IF($A70=1,$H70*($G$18<=$E70)*($G$19>=$F70),$H70*($G$18<=$F70)*($G$19>=$E70))
Y70: @IF($A70=1,$H70*($G$19<=$E70)*($G$20>=$F70),$H70*($G$19<=$F70)*($G$20>=$E70))
Z70: @IF($A70=1,$H70*($G$20<=$E70)*($G$21>=$F70),$H70*($G$20<=$F70)*($G$21>=$E70))
AA70: @IF($A70=1,$H70*($G$21<=$E70)*($G$22>=$F70),$H70*($G$21<=$F70)*($G$22>=$E70))
AB70: @IF($A70=1,$H70*($G$22<=$E70)*($G$23>=$F70),$H70*($G$22<=$F70)*($G$23>=$E70))
AC70: @IF($A70=1,$H70*($G$23<=$E70)*($G$24>=$F70),$H70*($G$23<=$F70)*($G$24>=$E70))
AD70: @IF($A70=1,$H70*($G$24<=$E70)*($G$25>=$F70),$H70*($G$24<=$F70)*($G$25>=$E70))
AE70: @IF($A70=1,$H70*($G$25<=$E70)*($G$26>=$F70),$H70*($G$25<=$F70)*($G$26>=$E70))
AF70: @IF($A70=1,$H70*($G$26<=$E70)*($G$27>=$F70),$H70*($G$26<=$F70)*($G$27>=$E70))
AG70: @IF($A70=1,$H70*($G$27<=$E70)*($G$28>=$F70),$H70*($G$27<=$F70)*($G$28>=$E70))
AH70: @IF($A70=1,$H70*($G$28<=$E70)*($G$29>=$F70),$H70*($G$28<=$F70)*($G$29>=$E70))
AI70: @IF($A70=1,$H70*($G$29<=$E70)*($G$30>=$F70),$H70*($G$29<=$F70)*($G$30>=$E70))
AJ70: @IF($A70=1,$H70*($G$30<=$E70)*($G$31>=$F70),$H70*($G$30<=$F70)*($G$31>=$E70))
AK70: @IF($A70=1,$H70*($G$31<=$E70)*($G$32>=$F70),$H70*($G$31<=$F70)*($G$32>=$E70))
AL70: @IF($A70=1,$H70*($G$32<=$E70)*($G$33>=$F70),$H70*($G$32<=$F70)*($G$33>=$E70))
AM70: @IF($A70=1,$H70*($G$33<=$E70)*($G$34>=$F70),$H70*($G$33<=$F70)*($G$34>=$E70))
AN70: @IF($A70=1,$H70*($G$34<=$E70)*($G$35>=$F70),$H70*($G$34<=$F70)*($G$35>=$E70))
AO70: @IF($A70=1,$H70*($G$35<=$E70)*($G$36>=$F70),$H70*($G$35<=$F70)*($G$36>=$E70))
AP70: @IF($A70=1,$H70*($G$36<=$E70)*($G$37>=$F70),$H70*($G$36<=$F70)*($G$37>=$E70))
AQ70: @IF($A70=1,$H70*($G$37<=$E70)*($G$38>=$F70),$H70*($G$37<=$F70)*($G$38>=$E70))
AR70: @IF($A70=1,$H70*($G$38<=$E70)*($G$39>=$F70),$H70*($G$38<=$F70)*($G$39>=$E70))
AS70: @IF($A70=1,$H70*($G$39<=$E70)*($G$40>=$F70),$H70*($G$39<=$F70)*($G$40>=$E70))
AT70: @IF($A70=1,$H70*($G$40<=$E70)*($G$41>=$F70),$H70*($G$40<=$F70)*($G$41>=$E70))
AU70: @IF($A70=1,$H70*($G$41<=$E70)*($G$42>=$F70),$H70*($G$41<=$F70)*($G$42>=$E70))
AV70: @IF($A70=1,$H70*($G$42<=$E70)*($G$43>=$F70),$H70*($G$42<=$F70)*($G$43>=$E70))
AW70: @IF($A70=1,$H70*($G$43<=$E70)*($G$44>=$F70),$H70*($G$43<=$F70)*($G$44>=$E70))
AX70: @IF($A70=1,$H70*($G$44<=$E70)*($G$45>=$F70),$H70*($G$44<=$F70)*($G$45>=$E70))
AY70: @IF($A70=1,$H70*($G$45<=$E70)*($G$46>=$F70),$H70*($G$45<=$F70)*($G$46>=$E70))
AZ70: @IF($A70=1,$H70*($G$46<=$E70)*($G$47>=$F70),$H70*($G$46<=$F70)*($G$47>=$E70))
BA70: @IF($A70=1,$H70*($G$47<=$E70)*($G$48>=$F70),$H70*($G$47<=$F70)*($G$48>=$E70))
BB70: @IF($A70=1,$H70*($G$48<=$E70)*($G$49>=$F70),$H70*($G$48<=$F70)*($G$49>=$E70))
BC70: @IF($A70=1,$H70*($G$49<=$E70)*($G$50>=$F70),$H70*($G$49<=$F70)*($G$50>=$E70))
BD70: @IF($A70=1,$H70*($G$50<=$E70)*($G$51>=$F70),$H70*($G$50<=$F70)*($G$51>=$E70))
BE70: @IF($A70=1,$H70*($G$51<=$E70)*($G$52>=$F70),$H70*($G$51<=$F70)*($G$52>=$E70))
BF70: @IF($A70=1,$H70*($G$52<=$E70)*($G$53>=$F70),$H70*($G$52<=$F70)*($G$53>=$E70))
BG70: @IF($A70=1,$H70*($G$53<=$E70)*($G$54>=$F70),$H70*($G$53<=$F70)*($G$54>=$E70))
BH70: @IF($A70=1,$H70*($G$54<=$E70)*($G$55>=$F70),$H70*($G$54<=$F70)*($G$55>=$E70))
BI70: @IF($A70=1,$H70*($G$55<=$E70)*($G$56>=$F70),$H70*($G$55<=$F70)*($G$56>=$E70))
```

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BJ70: @IF($A70=1,$H70*($G$56<=$E70)*($G$57>=$F70),$H70*($G$56<=$F70)*($G$57>=$E70))
BK70: @IF($A70=1,$H70*($G$57<=$E70)*($G$58>=$F70),$H70*($G$57<=$F70)*($G$58>=$E70))
BL70: @IF($A70=1,$H70*($G$58<=$E70)*($G$59>=$F70),$H70*($G$58<=$F70)*($G$59>=$E70))
BM70: @IF($A70=1,$H70*($G$59<=$E70)*($G$60>=$F70),$H70*($G$59<=$F70)*($G$60>=$E70))
BN70: @IF($A70=1,$H70*($G$60<=$E70)*($G$61>=$F70),$H70*($G$60<=$F70)*($G$61>=$E70))
BO70: @IF($A70=1,$H70*($G$61<=$E70)*($G$62>=$F70),$H70*($G$61<=$F70)*($G$62>=$E70))
BP70: @IF($A70=1,$H70*($G$62<=$E70)*($G$63>=$F70),$H70*($G$62<=$F70)*($G$63>=$E70))
BQ70: @IF($A70=1,$H70*($G$63<=$E70)*($G$64>=$F70),$H70*($G$63<=$F70)*($G$64>=$E70))
BR70: @IF($A70=1,$H70*($G$64<=$E70)*($G$65>=$F70),$H70*($G$64<=$F70)*($G$65>=$E70))
BS70: @IF($A70=1,$H70*($G$65<=$E70)*($G$66>=$F70),$H70*($G$65<=$F70)*($G$66>=$E70))
BT70: @IF($A70=1,$H70*($G$66<=$E70)*($G$67>=$F70),$H70*($G$66<=$F70)*($G$67>=$E70))
BU70: @IF($A70=1,$H70*($G$67<=$E70)*($G$68>=$F70),$H70*($G$67<=$F70)*($G$68>=$E70))
BV70: @IF($A70=1,$H70*($G$68<=$E70)*($G$69>=$F70),$H70*($G$68<=$F70)*($G$69>=$E70))
BW70: @IF($A70=1,$H70*($G$69<=$E70)*($G$70>=$F70),$H70*($G$69<=$F70)*($G$70>=$E70))
BX70: @IF($A70=1,$H70*($G$70<=$E70)*($G$71>=$F70),$H70*($G$70<=$F70)*($G$71>=$E70))
BY70: @IF($A70=1,$H70*($G$71<=$E70)*($G$72>=$F70),$H70*($G$71<=$F70)*($G$72>=$E70))
BZ70: @IF($A70=1,$H70*($G$72<=$E70)*($G$73>=$F70),$H70*($G$72<=$F70)*($G$73>=$E70))
P73: @SUM(P10..P70)
Q73: @SUM(Q10..Q70)
R73: @SUM(R10..R70)
S73: @SUM(S10..S70)
T73: @SUM(T10..T70)
U73: @SUM(U10..U70)
V73: @SUM(V10..V70)
W73: @SUM(W10..W70)
X73: @SUM(X10..X70)
Y73: @SUM(Y10..Y70)
Z73: @SUM(Z10..Z70)
AA73: @SUM(AA10..AA70)
AB73: @SUM(AB10..AB70)
AC73: @SUM(AC10..AC70)
AD73: @SUM(AD10..AD70)
AE73: @SUM(AE10..AE70)
AF73: @SUM(AF10..AF70)
AG73: @SUM(AG10..AG70)
AH73: @SUM(AH10..AH70)
AI73: @SUM(AI10..AI70)
AJ73: @SUM(AJ10..AJ70)
AK73: @SUM(AK10..AK70)
AL73: @SUM(AL10..AL70)
AM73: @SUM(AM10..AM70)
AN73: @SUM(AN10..AN70)
AO73: @SUM(AO10..AO70)
AP73: @SUM(AP10..AP70)
AQ73: @SUM(AQ10..AQ70)
AR73: @SUM(AR10..AR70)
AS73: @SUM(AS10..AS70)
AT73: @SUM(AT10..AT70)
AU73: @SUM(AU10..AU70)
AV73: @SUM(AV10..AV70)
AW73: @SUM(AW10..AW70)
AX73: @SUM(AX10..AX70)
AY73: @SUM(AY10..AY70)
AZ73: @SUM(AZ10..AZ70)
BA73: @SUM(BA10..BA70)
BB73: @SUM(BB10..BB70)
```

BC73: @SUM(BC10..BC70)
BD73: @SUM(BD10..BD70)
BE73: @SUM(BE10..BE70)
BF73: @SUM(BF10..BF70)
BG73: @SUM(BG10..BG70)
BH73: @SUM(BH10..BH70)
BI73: @SUM(BI10..BI70)
BJ73: @SUM(BJ10..BJ70)
BK73: @SUM(BK10..BK70)
BL73: @SUM(BL10..BL70)
BM73: @SUM(BM10..BM70)
BN73: @SUM(BN10..BN70)
BO73: @SUM(BO10..BO70)
BP73: @SUM(BP10..BP70)
BQ73: @SUM(BQ10..BQ70)
BR73: @SUM(BR10..BR70)
BS73: @SUM(BS10..BS70)
BT73: @SUM(BT10..BT70)
BU73: @SUM(BU10..BU70)
BV73: @SUM(BV10..BV70)
BW73: @SUM(BW10..BW70)
BX73: @SUM(BX10..BX70)
BY73: @SUM(BY10..BY70)
BZ73: @SUM(BZ10..BZ70)
P75: -0.3898
Q75: -0.37285
R75: -0.36251
S75: -0.34448
T75: 0.306797
U75: 0.737727
V75: 1.439539
W75: 1.453739
X75: 1.433759
Y75: 3.574
Z75: 3.621696
AA75: 3.600326
AB75: 3.169396
AC75: 3.170196
AD75: 3.114646
AE75: 3.213143
AF75: 0.717178
AG75: 0.829036
AH75: 0.768401
AI75: -310.831049
AJ75: -310.846369
AK75: 0.723061
AL75: 0.688333
AM75: 0.688563
AN75: -161.806117
AO75: 0.673493
AP75: 0.654612
AQ75: 0.640932
AR75: 0.639882
AS75: -188.868308
AT75: 0.624292
AU75: 0.634835

'75: -0.248286
I75: -0.193696
:75: 0.504194
:75: 0.505584
;75: -150.912086
A75: 0.677914
B75: 0.666763
C75: 0.713123
D75: -143.106027
E75: 0.698973
F75: 0.686323
G75: 0.961213
H75: 0.956749
I75: 0.902619
J75: -141.147901
K75: 0.943099
L75: 0.942759
M75: 0.941849
N75: 0.938967
O75: 0.917867
P75: -224.562903
Q75: 0.993097
R75: 0.893147
S75: 0.892897
T75: 0.892797
U75: 0.892537
V75: 0.887469
W75: 0.887529
X75: 0.213204
Y75: 0.183264
Z75: -3055.722

APPENDIX A5

1.0 CALCULATION OF THE PUMP SIZE AND THE INCREASE IN POWER OUTPUT

Figure 30 shows the modified section of the plant. (refer to Figure 20 for the original section of the plant)

In order to achieve a saving in power output, it was assumed that

1. Six hot streams from different sources were mixed together in a vessel before being pumped back into the main stream (i.e. after the main stream had been cooled down by the cooling water in the condenser and had been passed through the extraction pump).

2. No heat added by the extraction pump. (refer to Figure 20)

3. No heat added by PUMP1. (refer to Figure 30)

4. No heat losses to surroundings through pipes and vessel walls.

5. Saturated fluid exiting from the condenser. (refer to Figure 20)

6. The pressure of the vessel is the same as the lowest stream pressure.

7. The inlet and outlet temperatures of the steam going in and out the Air Ejector, Gland steam condenser and Drain cooler were the same as before. (refer to Figure 30)

8. The outlet and drain temperatures of Heater #1 was the same as before. (refer to Figure 30)

As the plant is not running at constant load, three different sets of data for the plant running at three different loads (250 MW, 200 MW and 150 MW) were used in the three different separate analyses.

1.1 250 MW POWER OUTPUT

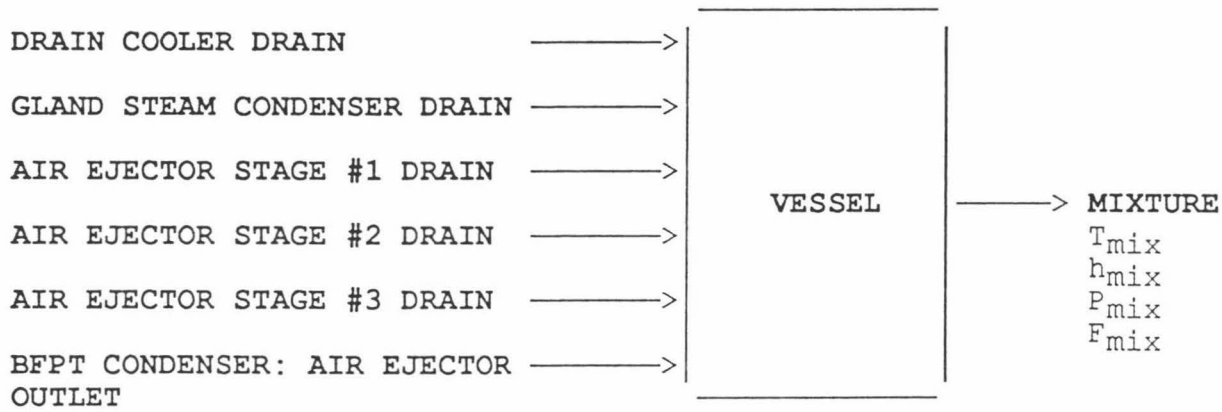
The following shows the six hot streams and their properties data :

	TEMPERATURE (T) (°C)	PRESSURE (P) (Bar)	ENTHALPY (h) (kJ/kg)	FLOWRATE (F) (kg/s)
Drain cooler drain	47.322	0.486	198.09	23.87
Gland steam condenser drain	99.068	0.980	415.13	0.218
Air Ejector stage #1 drain	56.240	0.167	235.35	0.064
Air Ejector stage #2 drain	79.654	0.467	333.46	0.062
Air Ejector stage #3 drain	99.632	1.000	417.51	0.058
BFPT* condensate : Air Ejector outlet	37.168	1.000	155.70	7.12

* BFPT is Boiler Feed Pump Turbine

1.1.1 THE PUMP SIZE

1.1.1.1 CALCULATION OF THE MIXING VESSEL EXIT STREAM PROPERTIES



The temperature of the mixture (h_{mix}) can be calculated using the following formula :

$$\Sigma (F_{individual} * h_{individual}) = (\Sigma F_{individual}) * h_{mix}$$

$(23.867 * 198.09) + (0.218 * 415.13) + (0.064 * 235.35) + (0.062 * 333.46) + (0.058 * 417.51) + (7.12 * 155.7) = (23.867 + 0.218 + 0.064 + 0.062 + 0.058 + 7.12) * h_{mix}$

$$h_{mix} = 190.73 \text{ kJ/kg}$$

The enthalpy of the mixture (T_{mix}) can found by two ways :

1. It can be calculated using the same method as for the temperature.

$$\Sigma (F_{individual} * T_{individual}) = (\Sigma F_{individual}) * T_{mix}$$

or

2. It can be found using steam tables, taking the pressure of the mixture (P_{mix}) as the pressure of the hot stream with the lowest pressure (i.e. 0.167 Bar).

Using method 1

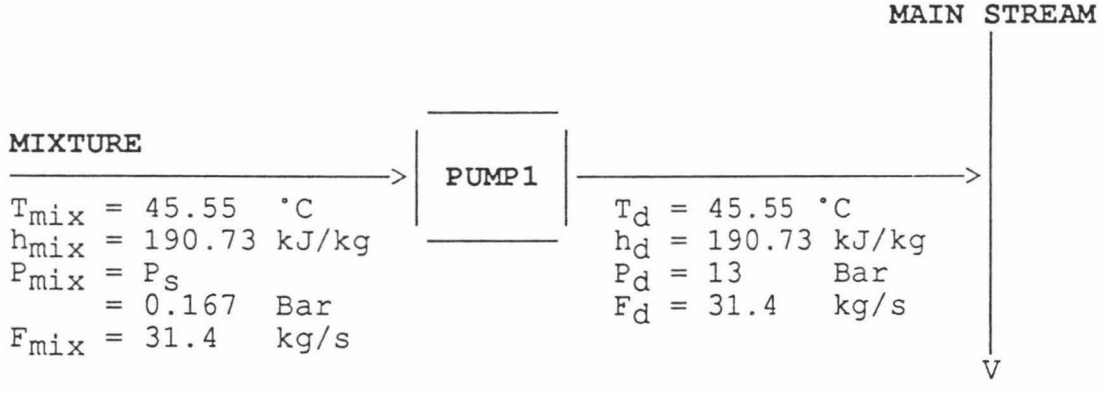
$(23.867 * 47.322) + (0.218 * 99.068) + (0.064 * 56.24) + (0.062 * 79.654) + (0.058 * 99.632) + (7.12 * 37.168) = 31.4 * T_{mix}$

$$T_{mix} = 45.55 \ ^{\circ}C$$

Therefore, we have

T_{mix}	=	45.55	°C
h_{mix}	=	190.73	kJ/kg
P_{mix}	=	0.167	Bar
F_{mix}	=	31.4	kg/s

1.1.1.2 CALCULATION OF THE PUMP SIZE



where P_s is the pump suction pressure
P_d is the pump delivery pressure

Theoretical pumping power = $(P_d - P_s) * \text{Flow/density}$

$= (1.3 - 0.0167) * 10^6 * 31.4/1000$

≈ 41 KW

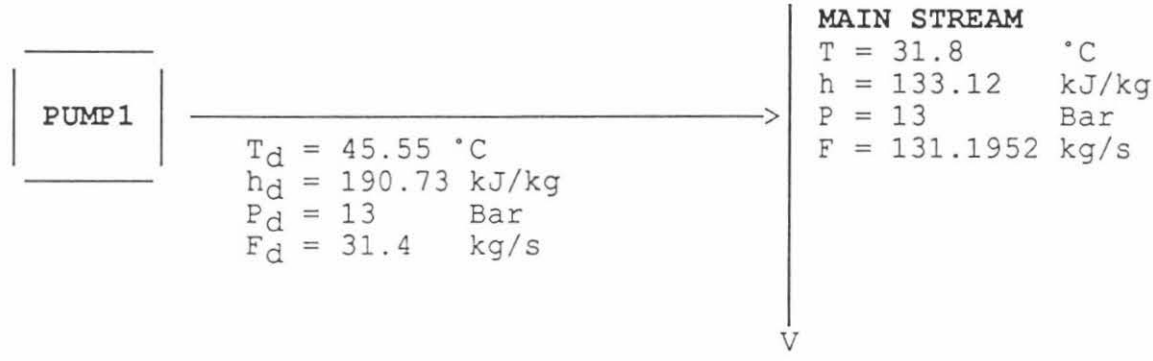
Assume that the efficiency of the pump is 50 %

Therefore

Actual power used in motor $\approx$ 82 KW

1.1.2 THE INCREASE IN POWER OUTPUT

1.1.2.1 CALCULATION OF MAIN STREAM PROPERIES AFTER PUMPED RETURN OF THE MIXTURE STREAMS



For enthalpy

$$\Sigma (F_{individual} * h_{individual}) = (\Sigma F_{individual}) * h_1$$

$$(131.1952 * 133.12) + (31.4 * 190.73) = (131.1952 + 31.4) * h_1$$

so

$$23453.63 = 162.5952 * h_1$$

therefore

$$h_1 = 144.24 \text{ kJ/kg}$$

For temperature

$$\Sigma (F_{individual} * T_{individual}) = (\Sigma F_{individual}) * T_1$$

$$(131.1952 * 31.8) + (31.4 * 45.55) = (131.1952 + 31.4) * T_1$$

so

$$5602.28 = 162.5952 * T_1$$

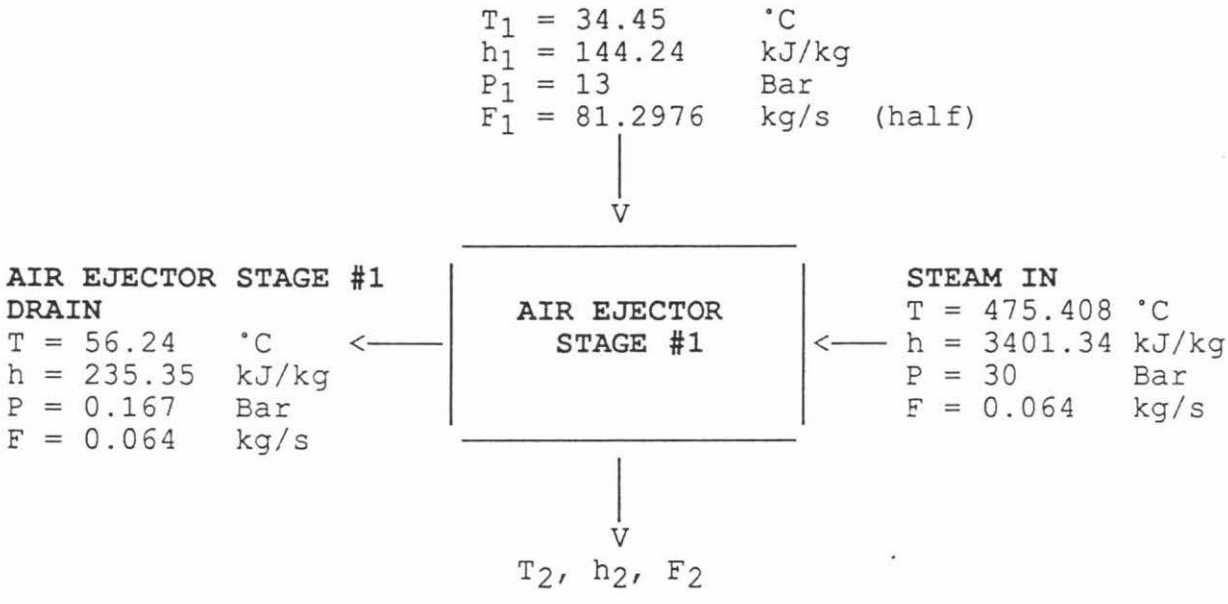
therefore

$$T_1 = 34.45 \text{ °C}$$

Therefore, we have

$T_1 = 34.45$ °C
$h_1 = 144.24$ kJ/kg
$P_1 = 13$ Bar
$F_1 = 162.5952$ kg/s

1.1.2.2 CALCULATION OF MAIN STREAM PROPERIES AFTER IT HAS BEEN PASSED THROUGH THE AIR EJECTOR STAGE #1



For h_2

$$F * \delta h = F_1 * (h_2 - h_1)$$

so

$$0.064 * (3401.34 - 235.35) = 81.2976 * (h_2 - 144.24)$$

$$h_2 = 146.73 \text{ kJ/kg}$$

For T_2

$$F * \delta T = F_1 * (T_2 - T_1)$$

so

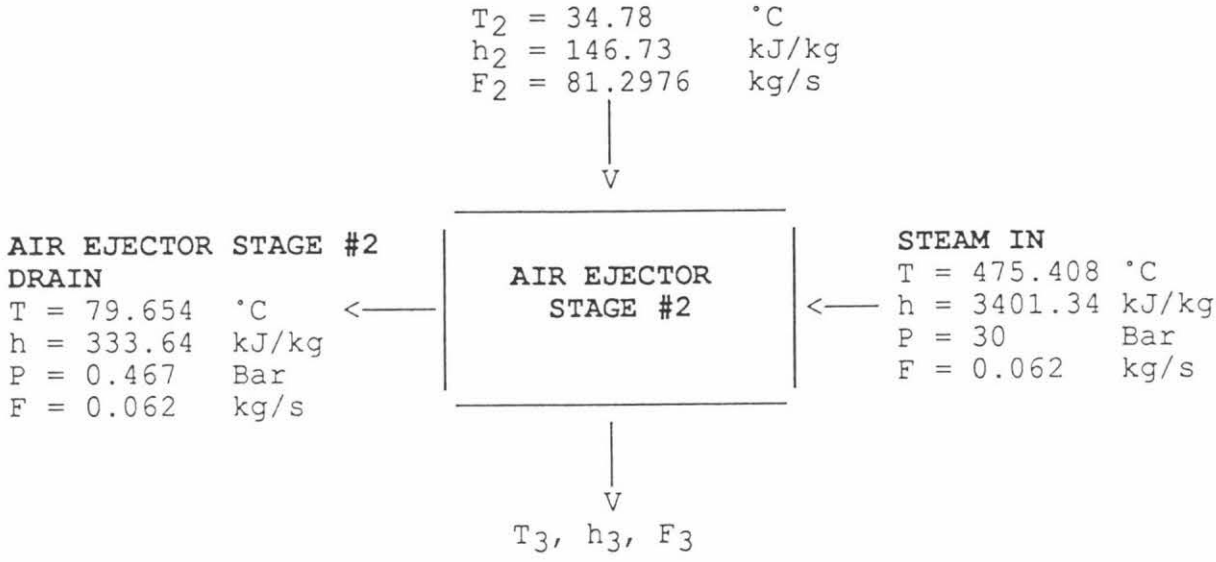
$$0.064 * (475.408 - 56.24) = 81.2976 * (T_2 - 34.45)$$

$$T_2 = 34.78 \text{ °C}$$

Therefore, we have

T_2 = 34.78 °C
h_2 = 146.73 kJ/kg
F_2 = 81.2976 kg/s

1.1.2.3 CALCULATION OF MAIN STREAM PROPERIES AFTER IT HAS BEEN PASSED THROUGH THE AIR EJECTOR STAGE #2



For h_3

$$F * \delta h = F_2 * (h_3 - h_2)$$

so

$$0.062 * (3401.34 - 333.46) = 81.2976 * (h_3 - 146.73)$$

$$h_3 = 149.07 \text{ kJ/kg}$$

For T_3

$$F * \delta T = F_2 * (T_3 - T_2)$$

so

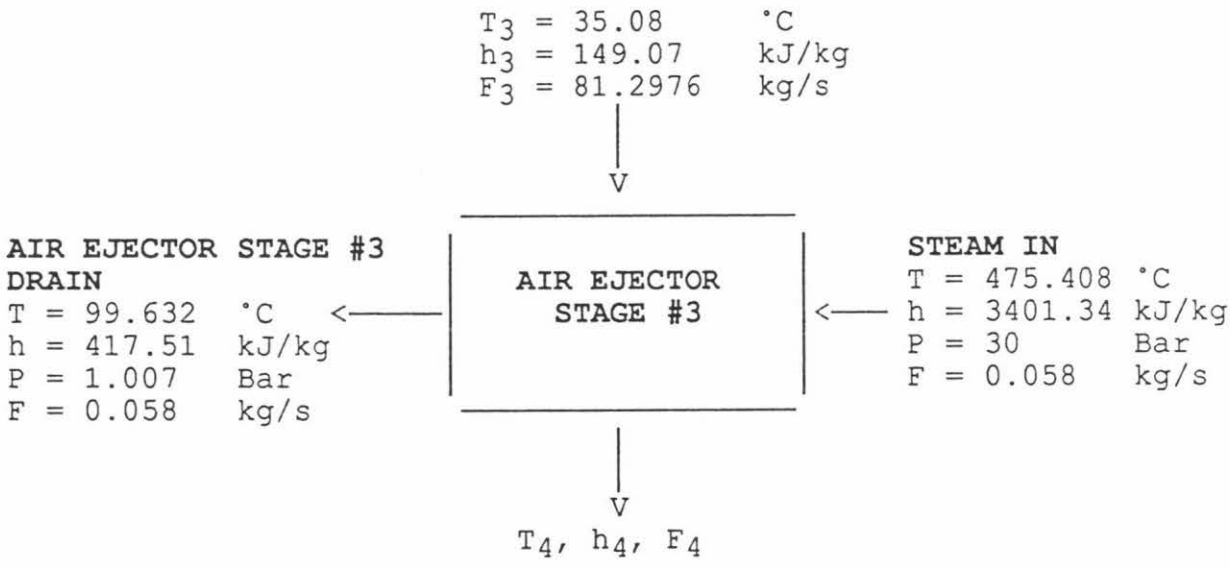
$$0.062 * (475.408 - 79.654) = 81.2976 * (T_3 - 34.78)$$

$$T_3 = 35.08 \text{ °C}$$

Therefore, we have

T_3 = 35.08 °C
h_3 = 149.07 kJ/kg
F_3 = 81.2976 kg/s

1.1.2.4 CALCULATION OF MAIN STREAM PROPERIES AFTER IT HAS BEEN PASSED THROUGH THE AIR EJECTOR STAGE #3



For h_4

$$F * \delta h = F_3 * (h_4 - h_3)$$

so

$$0.058 * (3401.34 - 417.51) = 81.2976 * (h_4 - 149.07)$$

$$h_4 = 151.14 \text{ kJ/kg}$$

For T_4

$$F * \delta T = F_3 * (T_4 - T_3)$$

so

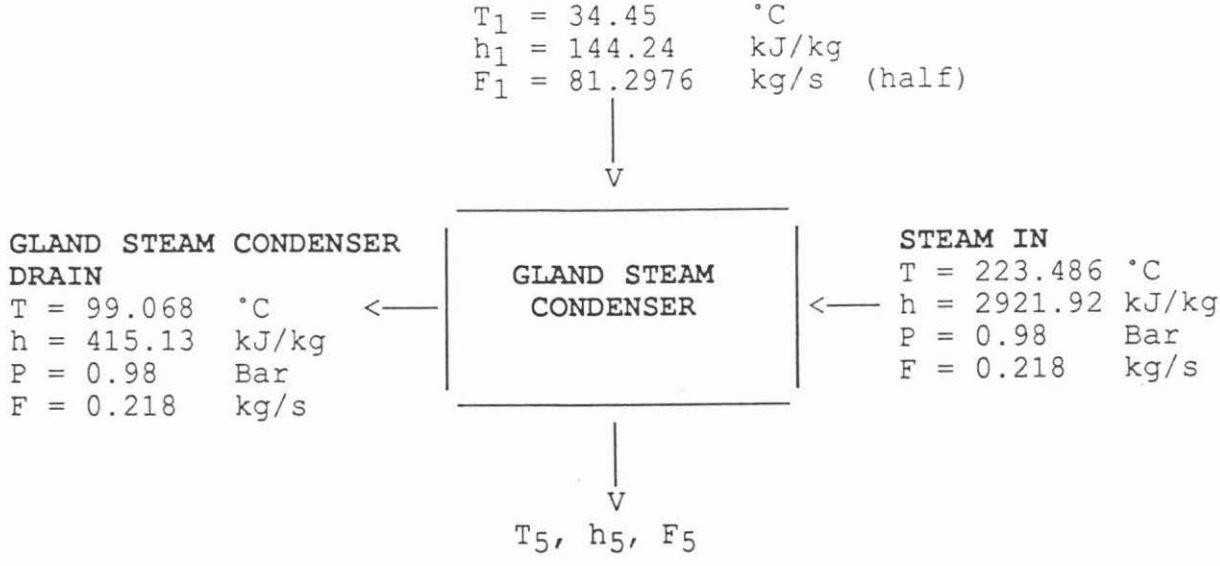
$$0.058 * (475.408 - 99.632) = 81.2976 * (T_4 - 35.08)$$

$$T_4 = 35.35\ ^{\circ}C$$

Therefore, we have

T_4	= 35.35	°C
h_4	= 151.14	kJ/kg
F_4	= 81.2976	kg/s

1.1.2.5 CALCULATION OF MAIN STREAM PROPERIES AFTER IT HAS BEEN PASSED THROUGH THE GLAND STEAM CONDENSER



For h_5

$$F * \delta h = F_1 * (h_5 - h_1)$$

so

$$0.218 * (2921.92 - 415.13) = 81.2976 * (h_5 - 144.24)$$

$$h_5 = 150.96\ kJ/kg$$

For T_5

$$F * \delta T = F_1 * (T_5 - T_1)$$

so

$$0.218 * (223.486 - 99.068) = 81.2976 * (T_4 - 34.45)$$

$$T_5 = 34.78 \text{ °C}$$

Therefore, we have

T_5	= 34.78	°C
h_5	= 150.96	kJ/kg
F_5	= 81.2976	kg/s

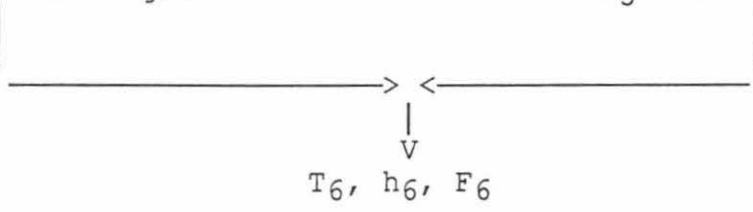
1.1.2.6 MIXING THE STREAM FROM THE GLAND STEAM CONDENSER WITH FROM THE AIR EJECTOR STAGE #3

AIR EJECTOR STAGE #3 OUTLET

T_4	= 35.35	°C
h_4	= 151.14	kJ/kg
F_4	= 81.2976	kg/s

GLAND STEAM CONDENSER OUTLET

T_5	= 34.78	°C
h_5	= 150.96	kJ/kg
F_5	= 81.2976	kg/s



T_6, h_6, F_6

For h_6

$$(h_4 * F_4) + (h_5 * F_5) = h_6 * (F_4 + F_5)$$

so

$$(151.14 * 81.2976) + (150.96 * 81.2976) = h_6 * (81.2976 * 2)$$

$$h_6 = 151.05 \text{ kJ/kg}$$

For T_6

$$(T_4 * F_4) + (T_5 * F_5) = T_6 * (F_4 + F_5)$$

so

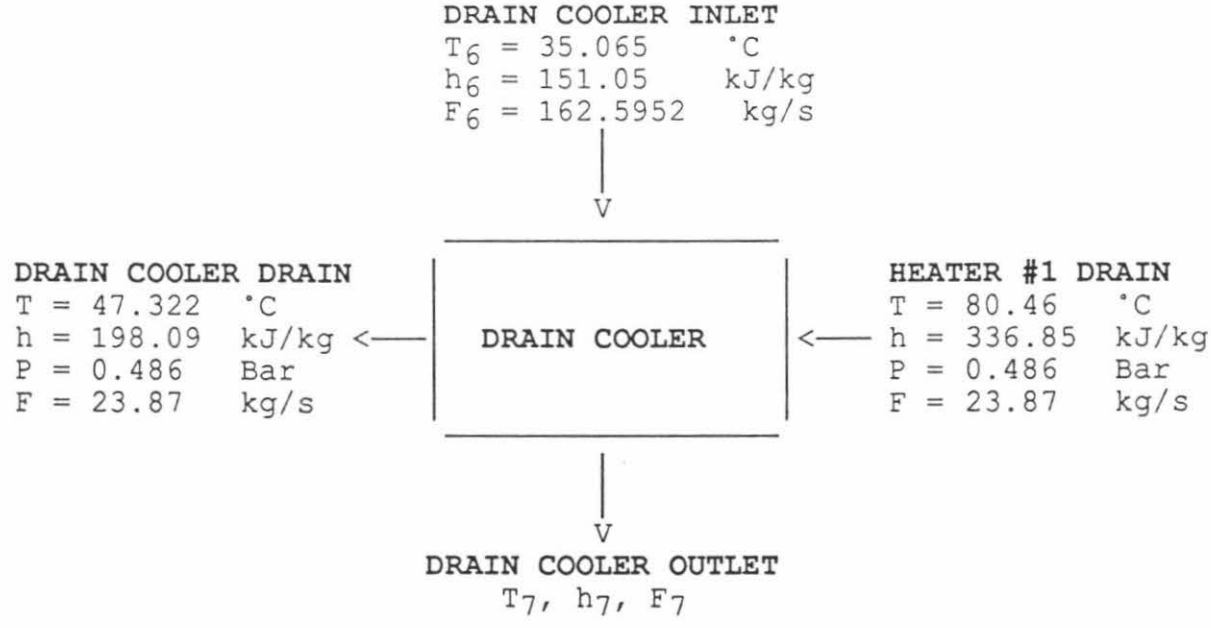
$$(35.35 * 81.2976) + (34.78 * 81.2976) = T_6 * (81.2976 * 2)$$

$$T_6 = 35.065 \ ^\circ C$$

Therefore, we have

$T_6 = 35.065$ °C
$h_6 = 151.05$ kJ/kg
$F_6 = 162.5952$ kg/s

1.1.2.7 CALCULATION OF MAIN STREAM PROPERIES AFTER IT HAS BEEN PASSED THROUGH THE DRAIN COOLER



For h_7

$$F * \delta h = F_6 * (h_7 - h_6)$$

so

$$23.87 * (336.85 - 198.09) = 162.5952 * (h_7 - 151.05)$$

$$h_7 = 171.42 \text{ kJ/kg}$$

For T_7

$$F * \delta T = F_6 * (T_7 - T_6)$$

so

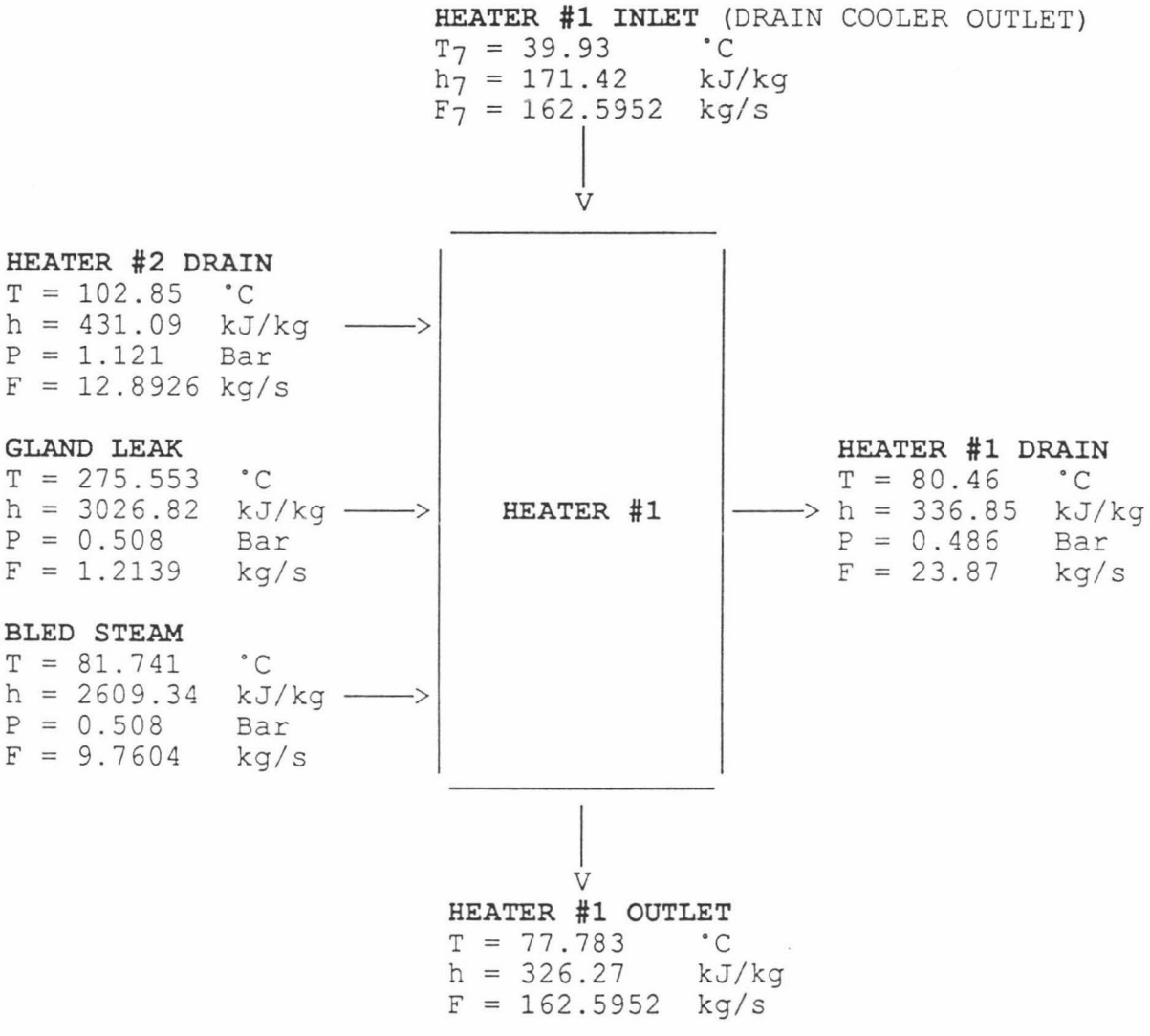
$$23.87 * (80.46 - 47.322) = 162.5952 * (T_7 - 35.065)$$

$$T_7 = 39.93 \text{ °C}$$

Therefore, we have

T_7	= 39.93	°C
h_7	= 171.42	kJ/kg
F_7	= 162.5952	kg/s

1.1.2.8 CALCULATION OF MAIN STREAM PROPERIES AFTER IT HAS BEEN PASSED THROUGH THE HEATER #1



We have three hot streams going into Heater #1. And now the cold stream that go into Heater #1 is hotter than before, thus less energy is needed to heat it up to the same temperature as before. This means that we can reduce the flowrate of one or more of the hot streams and use that extra flow to generate more electricity.

Calculation of the heat needed to heat up the feed water

$$F * \delta h = \delta H$$

where δH is the heat content

so

$$\delta H = 162.5952 * (326.27 - 171.42)$$
$$= 25178 \text{ kW}$$

Calculation of the available heat from

1. Heater #2 drain

$$\delta H = 12.8926 * (431.09 - 336.85)$$
$$= 1215 \text{ kW}$$

2. Bled steam

$$\delta H = 9.7604 * (2609.34 - 336.85)$$
$$= 22180 \text{ kW}$$

This means that we only need

(25178 - 1215 - 22180) = 1783 kW of heat to heat the feed water to its required temperature.

and we have from Gland leak to Heater #1

$$\delta H = 1.2139 * (3026.82 - 336.85)$$
$$= 3265 \text{ kW}$$

Therefore we can reduce flowrate from Gland leak and thus increase the power output.

The saving in steam flow from Gland leak will be

$$F = \frac{(3265 - 1783)}{(3026.82 - 336.85)} = 0.55 \text{ kg/s}$$

Now we can reduce flow to Heater #1 by 0.55 kg/s and increase the flow through turbines the same amount to generate more electicity.

GLAND LEAK			TURBINE EXHAUST	
T = 275.553	°C	Expand to	T = 31.8	°C
h = 3026.82	kJ/kg	——————————>	h = 2338.58	kJ/kg
P = 0.508	Bar		P = 0.047	Bar
F = 0.55	kg/s		F = 0.55	kg/s

Extra power produced will be

$$0.55 * (3026.82 - 2338.58) = 378 \text{ kW}$$

and we need about 82 kW to drive the pump

Therefore the net increase in power output will be **296 kW** (i.e. 0.1184 %).

1.2 200 MW POWER OUTPUT

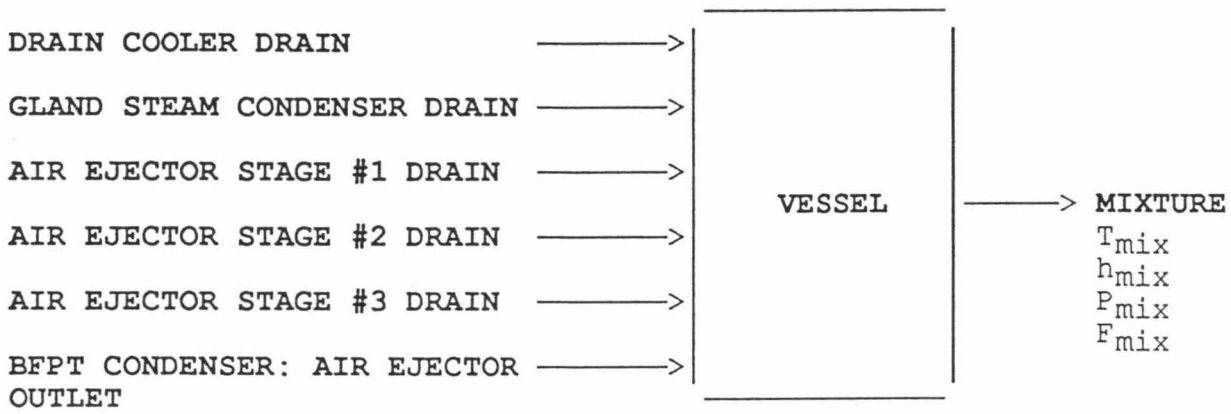
The following shows the six hot streams and their properties data:

	TEMPERATURE (T) (°C)	PRESSURE (P) (Bar)	ENTHALPY (h) (kJ/kg)	FLOWRATE (F) (kg/s)
Drain cooler drain	39.964	0.348	167.33	19.566
Gland steam condenser drain	99.068	0.980	415.13	0.218
Air Ejector stage #1 drain	55.406	0.160	231.87	0.086
Air Ejector stage #2 drain	79.309	0.461	332.02	0.083
Air Ejector stage #3 drain	99.632	1.000	417.51	0.078
BFPT* condensate : Air Ejector outlet	30.066	1.875	126.11	6.081

* BFPT is Boiler Feed Pump Turbine

1.2.1 THE PUMP SIZE

1.2.1.1 CALCULATION OF THE MIXING VESSEL EXIT STREAM PROPERTIES



The temperature of the mixture (h_{mix}) can be calculated using the following formula :

$$\Sigma (F_{individual} * h_{individual}) = (\Sigma F_{individual}) * h_{mix}$$

$(19.566 * 167.33) + (0.218 * 415.13) + (0.086 * 231.87) + (0.083 * 332.02) + (0.078 * 417.51) + (6.081 * 126.11) = (19.566 + 0.218 + 0.086 + 0.083 + 0.078 + 6.081) * h_{mix}$

so

$$4211.42 = 26.112 * T_{mix}$$

therefore

$$h_{mix} = 161.28 \text{ kJ/kg}$$

The enthalpy of the mixture (T_{mix}) can found by two ways :

1. It can be calculated using the same method as for the temperature.

$$\Sigma (F_{individual} * T_{individual}) = (\Sigma F_{individual}) * T_{mix}$$

or

2. It can be found using steam tables, taking the pressure of the mixture (P_{mix}) as the pressure of the hot stream with the lowest pressure (i.e. 0.16 Bar).

Using method 2

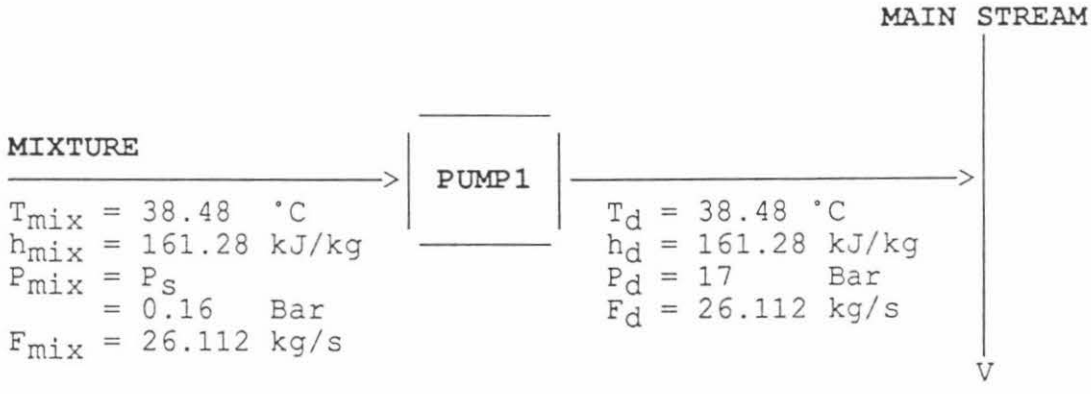
From steam table (J R Cooper And E J Le Fevre)

$$T_{mix} = 38.48 \ ^{\circ}C$$

Therefore, we have

T_{mix}	=	38.48 °C
h_{mix}	=	161.28 kJ/kg
P_{mix}	=	0.16 Bar
F_{mix}	=	26.112 kg/s

1.2.1.2 CALCULATION OF THE PUMP SIZE



where P_s is the pump suction pressure
P_d is the pump delivery pressure

Theoretical pumping power = $(P_d - P_s) * \text{Flow/density}$

$= (1.7 - 0.016) * 10^6 * 26.112/1000$

$\approx$ 44 KW

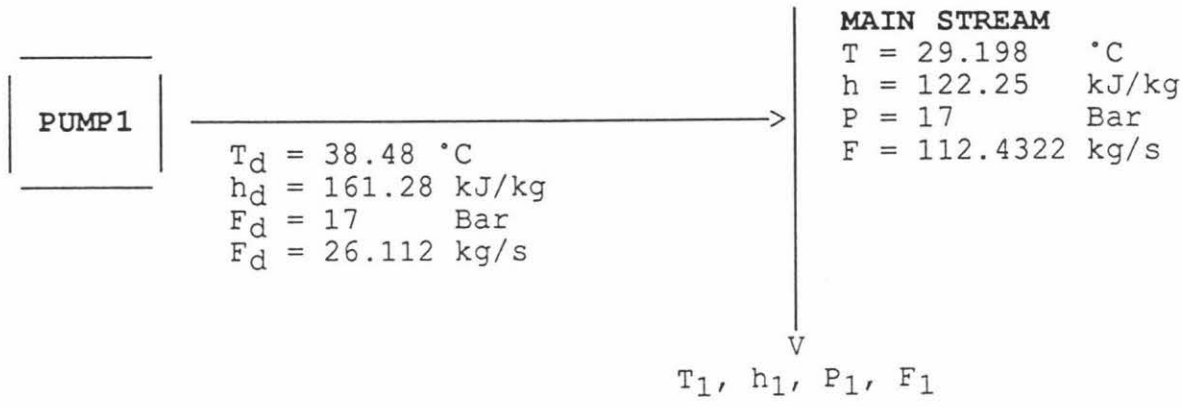
Assume that the efficiency of the pump is 50 %

Therefore

Actual power used in motor $\approx$ 88 KW

1.2.2 THE INCREASE IN POWER OUTPUT

1.2.2.1 CALCULATION OF MAIN STREAM PROPERIES AFTER PUMPED RETURN OF THE MIXTURE STREAMS



For enthalpy

$$\Sigma \left(F_{individual} * h_{individual} \right) = \left(\Sigma F_{individual} \right) * h_1$$

$$(112.4322 * 122.25) + (26.112 * 161.28) = (112.4322 + 26.112) * h_1$$

so

$$17956.15 = 138.5442 * T_1$$

$$h_1 = 129.61 \text{ kJ/kg}$$

For temperature

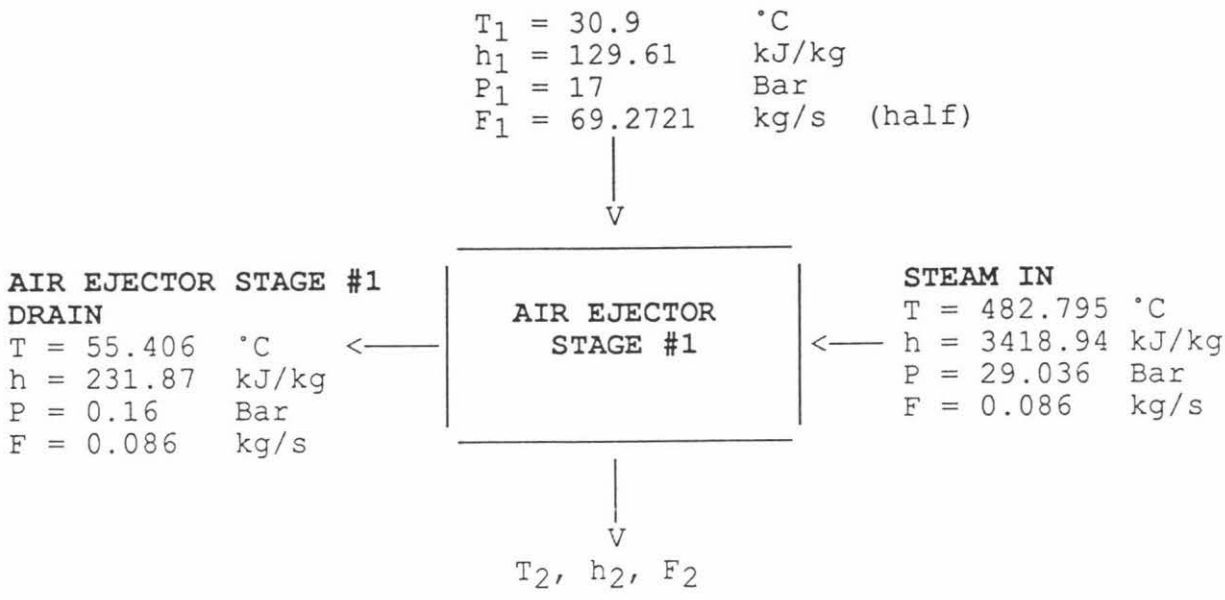
From steam table (J R Cooper And E J Le Fevre)

$$T_1 = 30.9 \text{ °C}$$

Therefore, we have

T_1	= 30.9	°C
h_1	= 129.61	kJ/kg
P_1	= 17	Bar
F_1	= 138.5442	kg/s

1.2.2.2 CALCULATION OF MAIN STREAM PROPERIES AFTER IT HAS BEEN PASSED THROUGH THE AIR EJECTOR STAGE #1



For h_2

$$F * \delta h = F_1 * (h_2 - h_1)$$

so

$$0.086 * (3418.94 - 231.87) = 69.2721 * (h_2 - 129.61)$$

$$h_2 = 133.55 \text{ kJ/kg}$$

For T_2

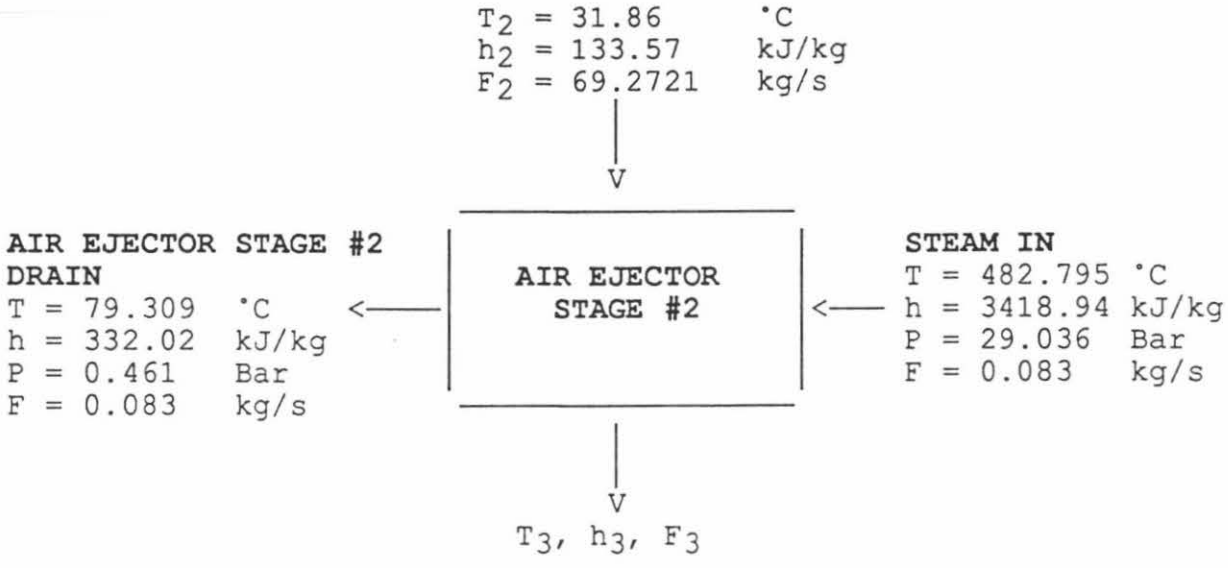
From steam table (J R Cooper And E J Le Fevre)

$$T_2 = 31.86 \text{ °C}$$

Therefore, we have

T_2 = 31.86 °C
h_2 = 133.55 kJ/kg
F_2 = 69.2721 kg/s

1.2.2.3 CALCULATION OF MAIN STREAM PROPERIES AFTER IT HAS BEEN PASSED THROUGH THE AIR EJECTOR STAGE #2



For h_3

$$F * \delta h = F_2 * (h_3 - h_2)$$

so

$$0.083 * (3418.94 - 332.02) = 69.2721 * (h_3 - 133.55)$$

$$h_3 = 137.27 \text{ kJ/kg}$$

For T_3

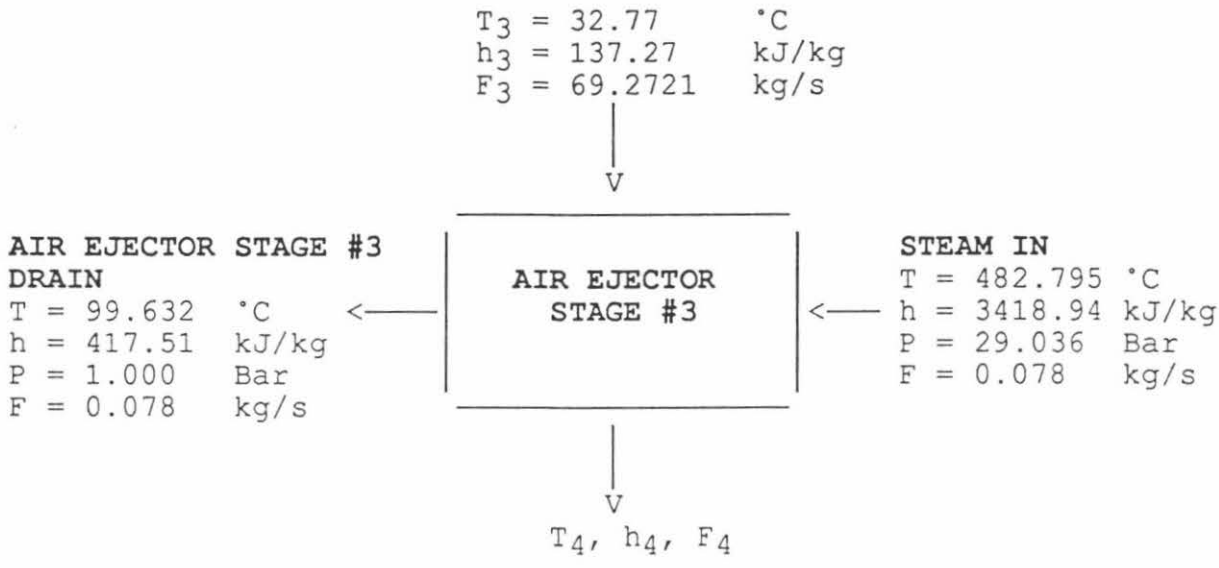
From steam table (J R Cooper And E J Le Fevre)

$$T_3 = 32.77 \text{ °C}$$

Therefore, we have

T_3 = 32.77 °C
h_3 = 137.27 kJ/kg
F_3 = 69.2721 kg/s

1.2.2.4 CALCULATION OF MAIN STREAM PROPERIES AFTER IT HAS BEEN PASSED THROUGH THE AIR EJECTOR STAGE #3



For h_4

$$F * \delta h = F_3 * (h_4 - h_3)$$

so

$$0.078 * (3418.94 - 417.51) = 69.2721 * (h_4 - 137.27)$$

$$h_4 = 140.65 \text{ kJ/kg}$$

For T_4

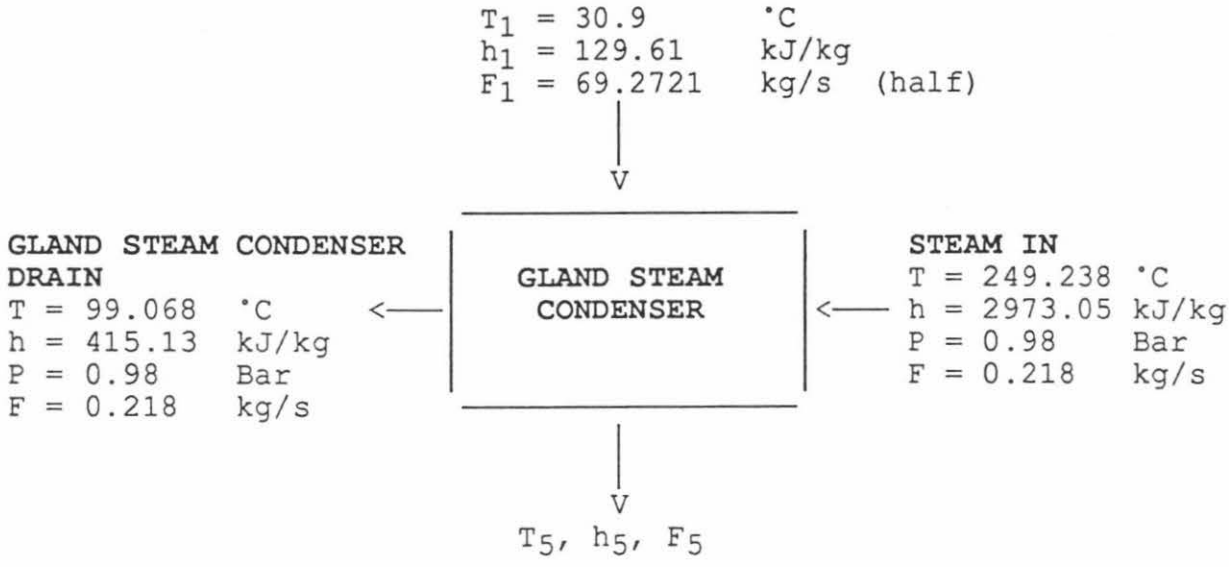
From steam table (J R Cooper And E J Le Fevre)

$$T_4 = 33.58 \text{ °C}$$

Therefore, we have

T_4 = 33.58 °C
h_4 = 140.65 kJ/kg
F_4 = 69.2721 kg/s

1.2.2.5 CALCULATION OF MAIN STREAM PROPERIES AFTER IT HAS BEEN PASSED THROUGH THE GLAND STEAM CONDENSER



For h_5

$$F * \delta h = F_1 * (h_5 - h_1)$$

so

$$0.218 * (2973.05 - 415.13) = 69.2721 * (h_5 - 129.61)$$

$$h_5 = 137.65 \text{ kJ/kg}$$

For T_5

From steam table (J R Cooper And E J Le Fevre)

$$T_5 = 32.86 \text{ °C}$$

Therefore, we have

T_5 = 32.86 °C
h_5 = 137.65 kJ/kg
F_5 = 69.2721 kg/s

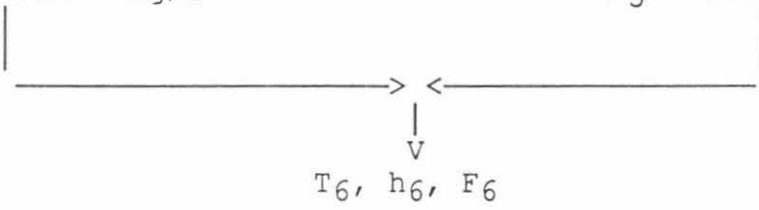
1.2.2.6 MIXING THE STREAM FROM THE GLAND STEAM CONDENSER WITH FROM THE AIR EJECTOR STAGE #3

AIR EJECTOR STAGE #3 OUTLET

$T_4 = 33.58$ °C
$h_4 = 140.65$ kJ/kg
$F_4 = 69.2721$ kg/s

GLAND STEAM CONDENSER OUTLET

$T_5 = 32.86$ °C
$h_5 = 137.65$ kJ/kg
$F_5 = 69.2721$ kg/s



T_6, h_6, F_6

For h_6

$$(h_4 * F_4) + (h_5 * F_5) = h_6 * (F_4 + F_5)$$

so

$$(140.65 * 69.2721) + (137.65 * 69.2721) = T_6 * (69.2721 * 2)$$

$$h_6 = 139.15 \text{ kJ/kg}$$

For T_6

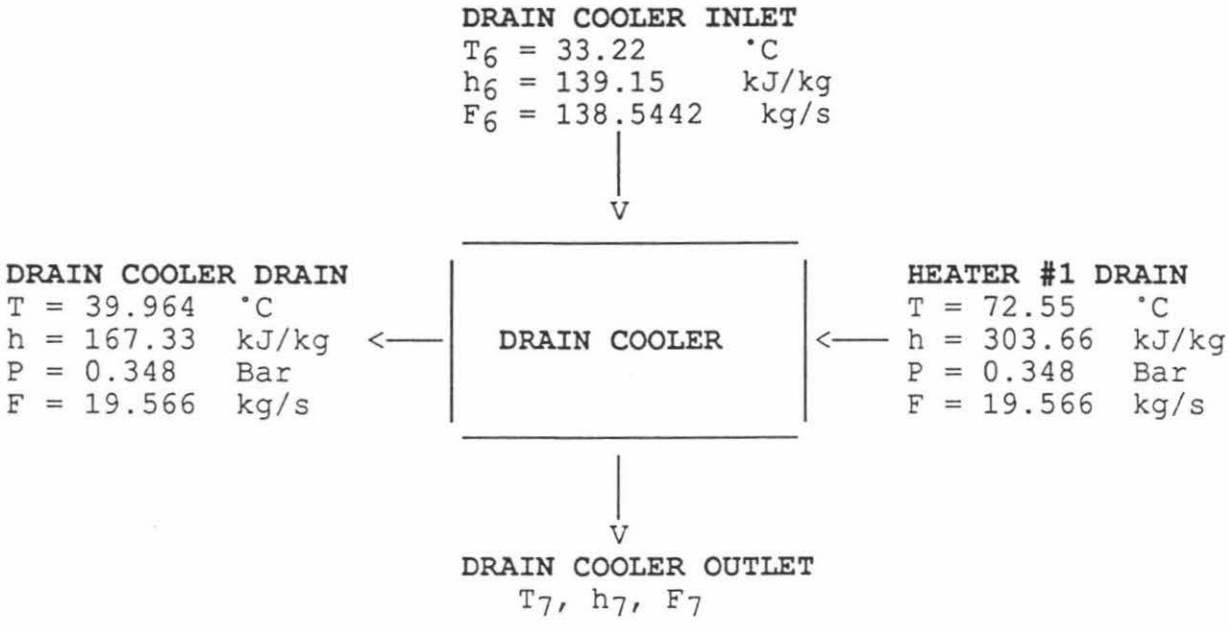
From steam table (J R Cooper And E J Le Fevre)

$$T_6 = 33.22 \text{ °C}$$

Therefore, we have

$T_6 = 33.22$ °C
$h_6 = 139.15$ kJ/kg
$F_6 = 138.5442$ kg/s

1.2.2.7 CALCULATION OF MAIN STREAM PROPERIES AFTER IT HAS BEEN PASSED THROUGH THE DRAIN COOLER



For h_7

$$F * \delta h = F_6 * (h_7 - h_6)$$

so

$$19.566 * (303.66 - 167.33) = 138.5442 * (h_7 - 139.15)$$

$$h_7 = 158.40 \text{ kJ/kg}$$

For T_7

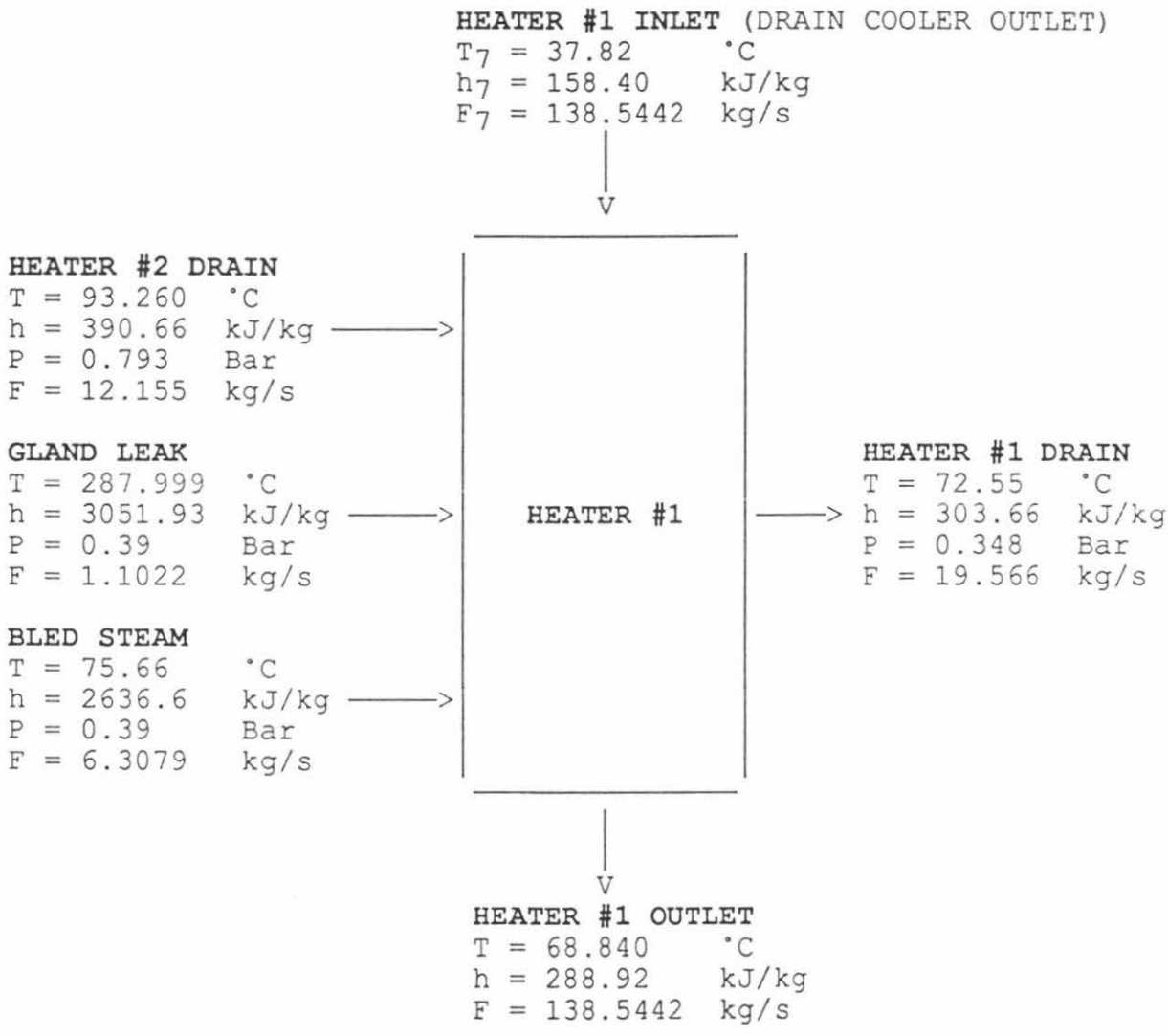
From steam table (J R Cooper And E J Le Fevre)

$$T_7 = 37.82 \text{ °C}$$

Therefore, we have

T_7 = 37.82 °C
h_7 = 158.40 kJ/kg
F_7 = 138.5442 kg/s

1.2.2.8 CALCULATION OF MAIN STREAM PROPERIES AFTER IT HAS BEEN PASSED THROUGH THE HEATER #1



Calculation of the heat needed to heat up the feed water

$$F * \delta h = \delta H$$

where δH is the heat content

so

$$\delta H = 138.5442 * (288.92 - 158.40)$$
$$= 18083 \text{ kW}$$

Calculation of the available heat from

1. Heater #2 drain

$$\delta H = 12.155 * (390.66 - 303.66)$$
$$= 1057 \text{ kW}$$

2. Bled steam

$$\delta H = 6.3079 * (2636.6 - 303.66)$$
$$= 14715 \text{ kW}$$

This means that we only need

(18083 - 1057 - 14715) = 2311 kW of heat to heat the feed water to its required temperature.

and we have from Gland leak to Heater #1

$$\delta H = 1.1022 * (3051.93 - 303.66)$$
$$= 3029 \text{ kW}$$

Therefore we can reduce flowrate from Gland leak and thus increase the power output.

The saving in steam flow from Gland leak will be

$$F = \frac{(3029 - 2311)}{(3051.93 - 303.66)} = 0.26 \text{ kg/s}$$

Now we can reduce flow to Heater #1 by 0.26 kg/s and increase the flow through turbines the same amount to generate more electicity.

GLAND LEAK			TURBINE EXHAUST	
T = 287.999	°C	Expand to	T = 29.198	°C
h = 3051.93	kJ/kg	——————————>	h = 2372.51	kJ/kg
P = 0.390	Bar		P = 0.041	Bar
F = 0.26	kg/s		F = 0.26	kg/s

Extra power produced will be

$$0.26 * (3051.93 - 2372.51) = 176 \text{ kW}$$

and we need about 88 kW to drive the pump

Therefore the net increase in power output will be **88 kW** (i.e. 0.0044%).

1.3 150 MW POWER OUTPUT

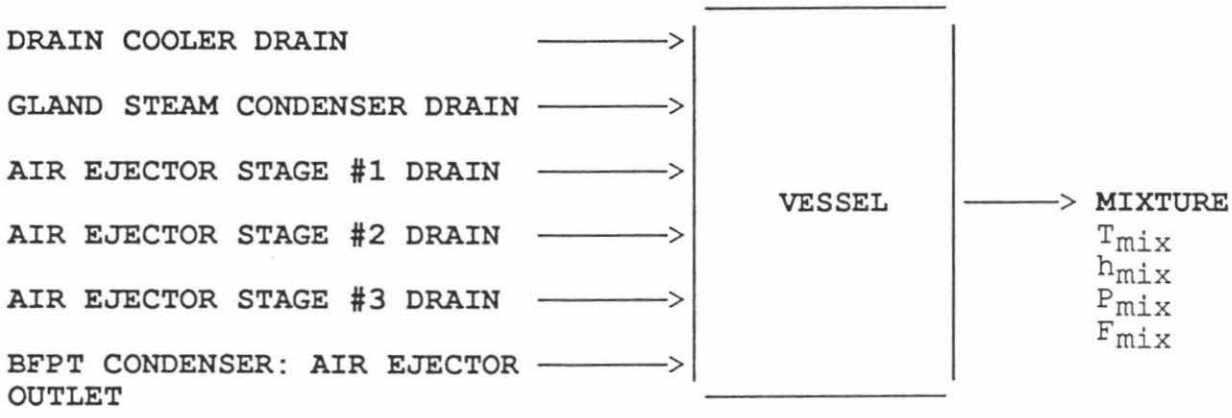
The following shows the six hot streams and their properties data :

	TEMPERATURE (T) (°C)	PRESSURE (P) (Bar)	ENTHALPY (h) (kJ/kg)	FLOWRATE (F) (kg/s)
Drain cooler drain	36.223	0.302	151.69	13.615
Gland steam condenser drain	99.068	0.980	415.13	0.218
Air Ejector stage #1 drain	54.517	0.154	228.15	0.104
Air Ejector stage #2 drain	78.949	0.454	330.51	0.101
Air Ejector stage #3 drain	99.632	1.000	417.51	0.094
BFPT* condensate : Air Ejector outlet	30.753	1.971	128.98	4.831

* BFPT is Boiler Feed Pump Turbine

1.3.1 THE PUMP SIZE

1.3.1.1 CALCULATION OF THE MIXING VESSEL EXIT STREAM PROPERTIES



The temperature of the mixture (h_{mix}) can be calculated using the following formula :

$$\Sigma \left(F_{individual} * h_{individual} \right) = \left(\Sigma F_{individual} \right) * h_{mix}$$

$(14.512 * 151.69) + (0.218 * 415.13) + (0.104 * 228.15) + (0.101 * 330.51) + (0.094 * 417.15) + (4.830 * 128.98) = (13.615 + 0.218 + 0.104 + 0.101 + 0.094 + 4.830) * h_{mix}$

so

$$3011.12 = 19.859 * h_{mix}$$

therefore

$$h_{mix} = 151.62 \text{ kJ/kg}$$

The enthalpy of the mixture (T_{mix}) can found by two ways :

1. It can be calculated using the same method as for the temperature.

$$\Sigma \left(F_{individual} * T_{individual} \right) = \left(\Sigma F_{individual} \right) * T_{mix}$$

or

2. It can be found using steam tables, taking the pressure of the mixture (P_{mix}) as the pressure of the hot stream with the lowest pressure (i.e. 0.154 Bar).

Using method 2

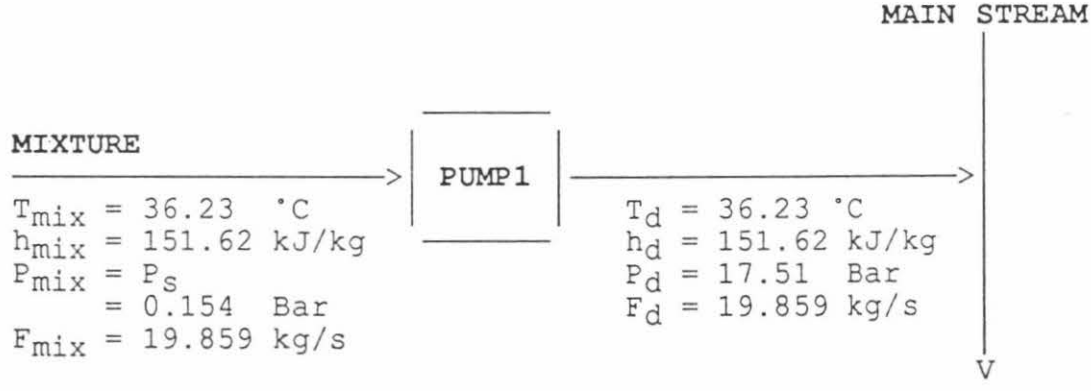
From steam table (J R Cooper And E J Le Fevre)

$$T_{mix} = 36.23\ ^{\circ}C$$

Therefore, we have

$$\begin{aligned} T_{mix} &= 36.23 \ ^{\circ}C \\ h_{mix} &= 151.62 \ kJ/kg \\ P_{mix} &= 0.154 \ Bar \\ F_{mix} &= 19.859 \ kg/s \end{aligned}$$

1.3.1.2 CALCULATION OF THE PUMP SIZE



where P_s is the pump suction pressure
P_d is the pump delivery pressure

Theoretical pumping power = $(P_d - P_s) * Flow/density$

$= (1.751 - 0.0154) * 10^6 * 19.859/1000$

≈ 35 KW

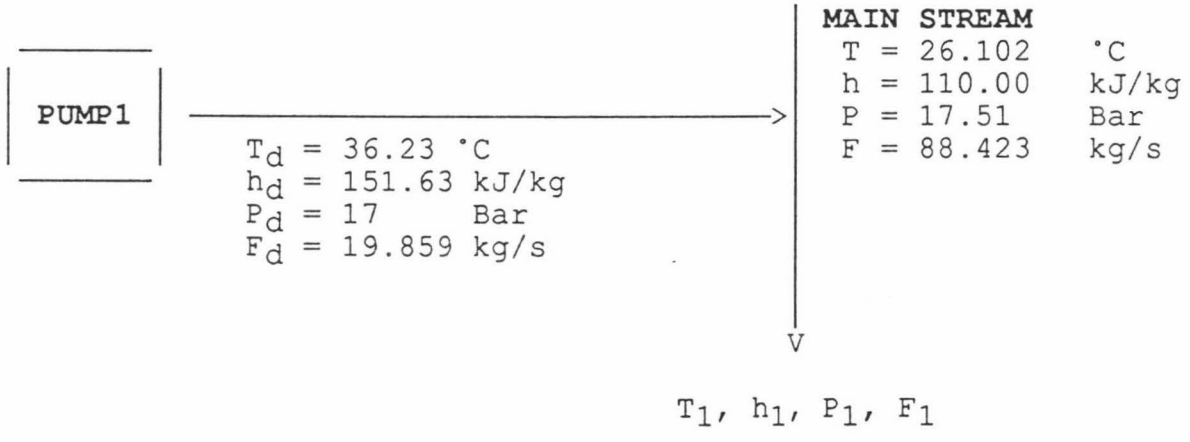
Assume that the efficiency of the pump is 50 %

Therefore

Actual power used in motor ≈ 70 KW

1.3.2 THE INCREASE IN POWER OUTPUT

1.3.2.1 CALCULATION OF MAIN STREAM PROPERIES AFTER PUMPED RETURN OF THE MIXTURE STREAMS



For enthalpy

$$\Sigma \left(F_{individual} * h_{individual} \right) = \left(\Sigma F_{individual} \right) * h_1$$

$$(88.423 * 110.00) + (19.859 * 151.63) = (88.423 + 19.859) * h_1$$

so

$$12737.75 = 108.282 * T_1$$

$$h_1 = 117.63 \text{ kJ/kg}$$

For temperature

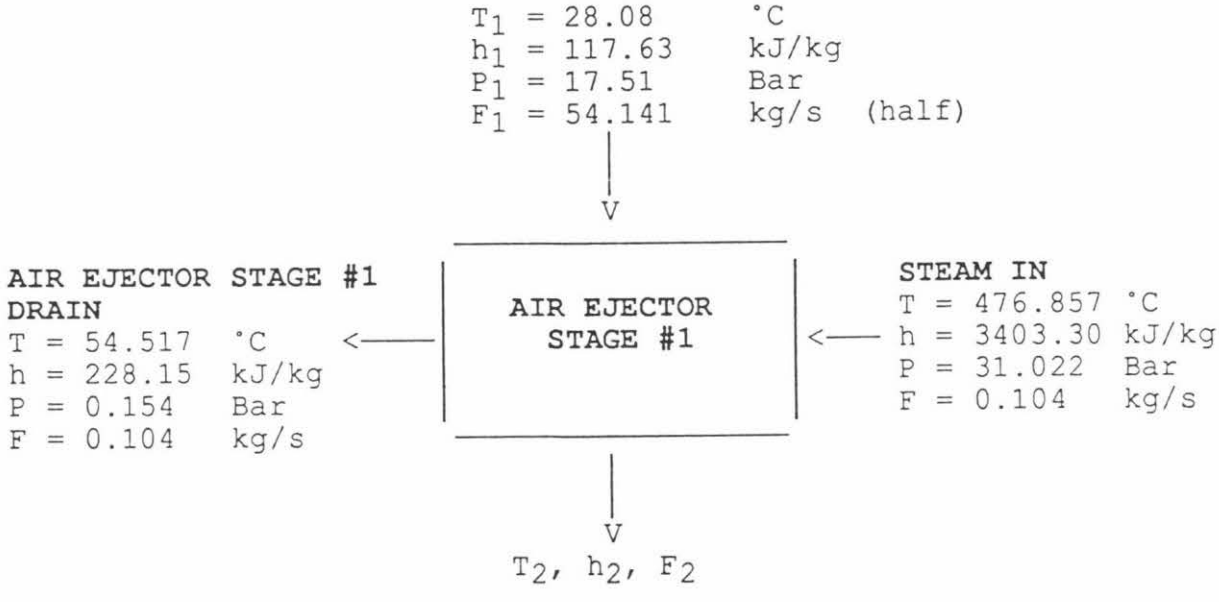
From steam table (J R Cooper And E J Le Fevre)

$$T_1 = 28.08 \text{ °C}$$

Therefore, we have

T_1	= 28.08	°C
h_1	= 117.63	kJ/kg
P_1	= 17.51	Bar
F_1	= 108.282	kg/s

1.3.2.2 CALCULATION OF MAIN STREAM PROPERIES AFTER IT HAS BEEN PASSED THROUGH THE AIR EJECTOR STAGE #1



For h_2

$$F * \delta h = F_1 * (h_2 - h_1)$$

so

$$0.104 * (3403.30 - 228.15) = 54.141 * (h_2 - 117.63)$$

$$h_2 = 123.72 \text{ kJ/kg}$$

For T_2

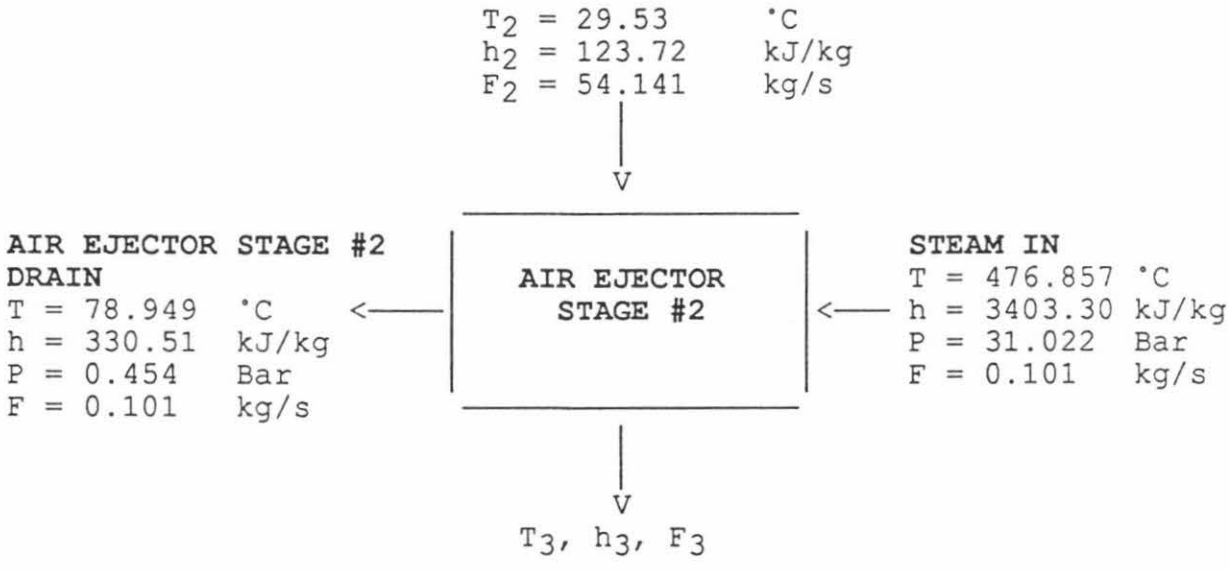
From steam table (J R Cooper And E J Le Fevre)

$$T_2 = 29.53 \text{ °C}$$

Therefore, we have

$T_2 = 29.53$ °C
$h_2 = 123.72$ kJ/kg
$F_2 = 54.141$ kg/s

1.3.2.3 CALCULATION OF MAIN STREAM PROPERIES AFTER IT HAS BEEN PASSED THROUGH THE AIR EJECTOR STAGE #2



For h_3

$$F * \delta h = F_2 * (h_3 - h_2)$$

so

$$0.101 * (3403.30 - 330.51) = 54.141 * (h_3 - 123.72)$$

$$h_3 = 129.45 \text{ kJ/kg}$$

For T_3

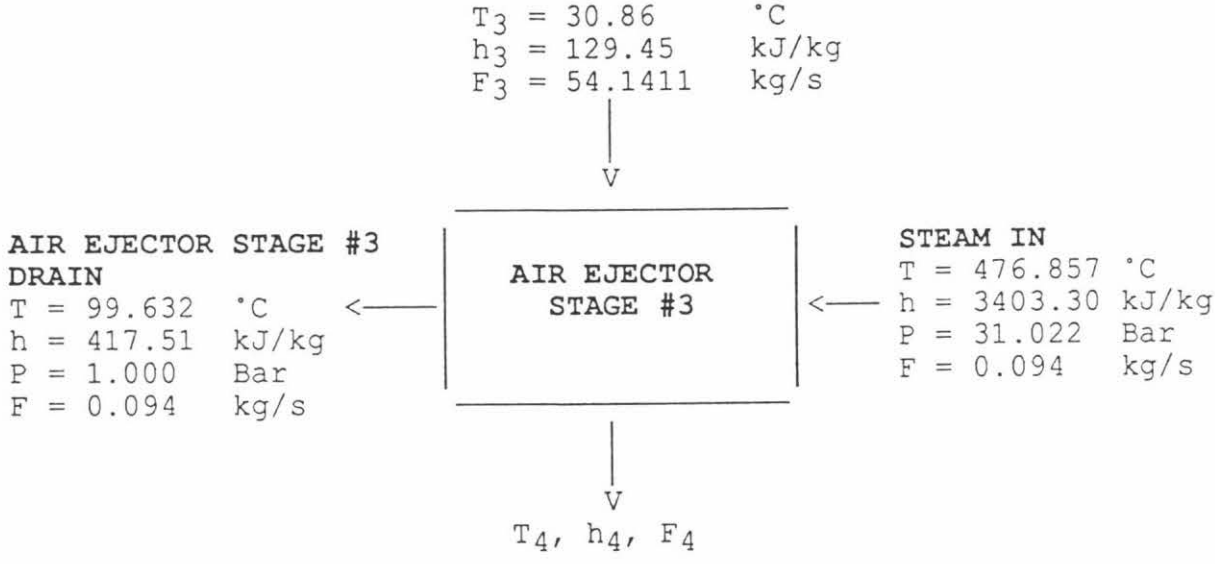
From steam table (J R Cooper And E J Le Fevre)

$$T_3 = 30.86 \text{ °C}$$

Therefore, we have

$T_3 = 30.86$ °C
$h_3 = 129.45$ kJ/kg
$F_3 = 54.141$ kg/s

1.3.2.4 CALCULATION OF MAIN STREAM PROPERIES AFTER IT HAS BEEN PASSED THROUGH THE AIR EJECTOR STAGE #3



For h_4

$$F * \delta h = F_3 * (h_4 - h_3)$$

so

$$0.094 * (3403.30 - 417.51) = 54.1411 * (h_4 - 129.45)$$

$$h_4 = 134.63 \text{ kJ/kg}$$

For T_4

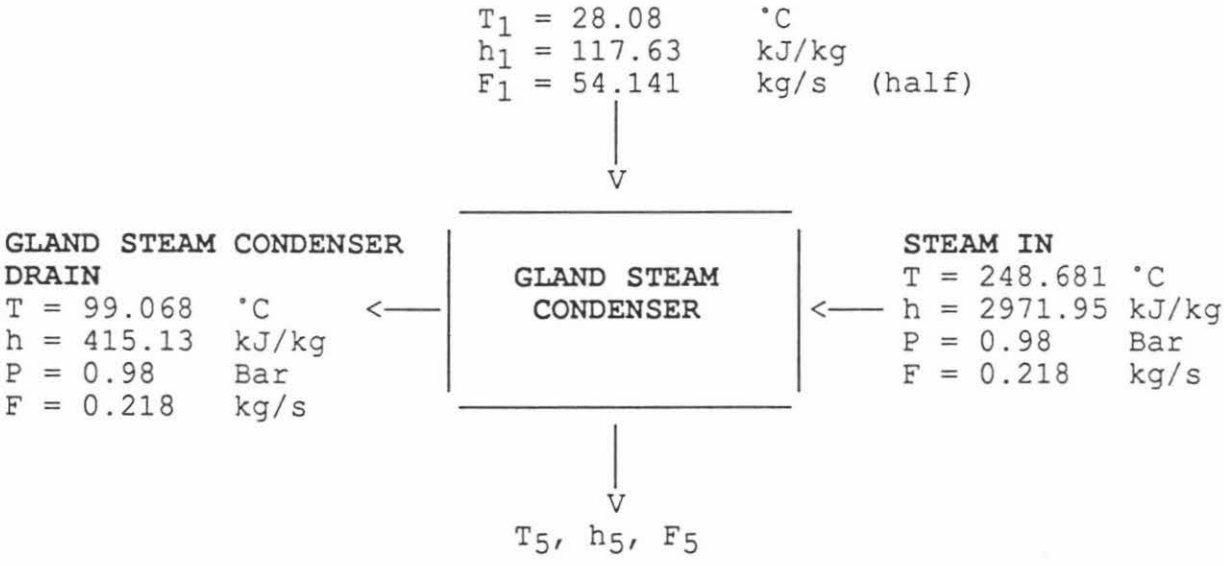
From steam table (J R Cooper And E J Le Fevre)

$$T_4 = 32.11 \text{ °C}$$

Therefore, we have

$T_4 = 32.11$ °C
$h_4 = 134.63$ kJ/kg
$F_4 = 54.141$ kg/s

1.3.2.5 CALCULATION OF MAIN STREAM PROPERIES AFTER IT HAS BEEN PASSED THROUGH THE GLAND STEAM CONDENSER



For h_5

$$F * \delta h = F_1 * (h_5 - h_1)$$

so

$$0.218 * (2971.95 - 415.13) = 54.141 * (h_5 - 117.63)$$

$$h_5 = 127.92 \text{ kJ/kg}$$

For T_5

From steam table (J R Cooper And E J Le Fevre)

$$T_5 = 30.51 \text{ °C}$$

Therefore, we have

$T_5 = 30.51$ °C
$h_5 = 127.92$ kJ/kg
$F_5 = 54.141$ kg/s

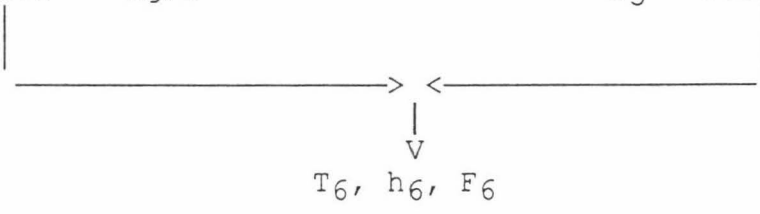
1.3.2.6 MIXING THE STREAM FROM THE GLAND STEAM CONDENSER WITH FROM THE AIR EJECTOR STAGE #3

AIR EJECTOR STAGE #3 OUTLET

$T_4 = 32.11$ °C
$h_4 = 134.63$ kJ/kg
$F_4 = 54.141$ kg/s

GLAND STEAM CONDENSER OUTLET

$T_5 = 30.51$ °C
$h_5 = 127.92$ kJ/kg
$F_5 = 54.141$ kg/s



For h_6

$$(h_4 * F_4) + (h_5 * F_5) = h_6 * (F_4 + F_5)$$

so

$$(134.63 * 54.141) + (127.92 * 54.141) = T_6 * (54.141 * 2)$$

$$h_6 = 131.27 \text{ kJ/kg}$$

For T_6

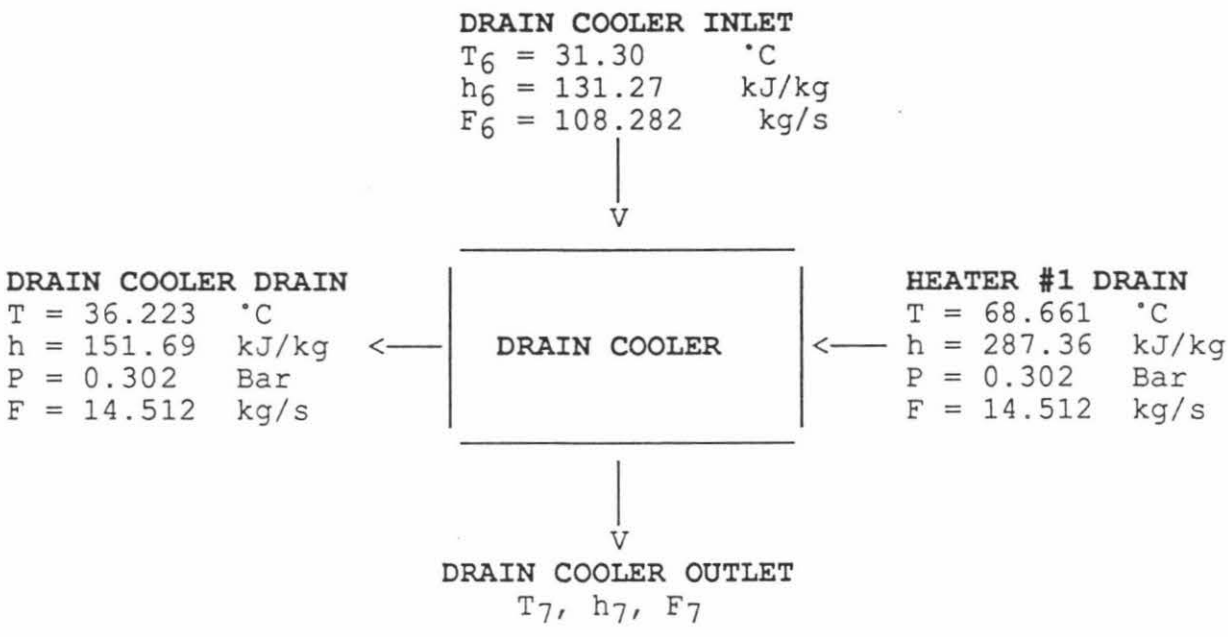
From steam table (J R Cooper And E J Le Fevre)

$$T_6 = 31.30 \text{ °C}$$

Therefore, we have

$T_6 = 31.30$ °C
$h_6 = 131.27$ kJ/kg
$F_6 = 108.282$ kg/s

1.3.2.7 CALCULATION OF MAIN STREAM PROPERIES AFTER IT HAS BEEN PASSED THROUGH THE DRAIN COOLER



For h_7

$$F * \delta h = F_6 * (h_7 - h_6)$$

so

$$14.512 * (287.36 - 151.69) = 108.282 * (h_7 - 131.27)$$

$$h_7 = 149.45 \text{ kJ/kg}$$

For T_7

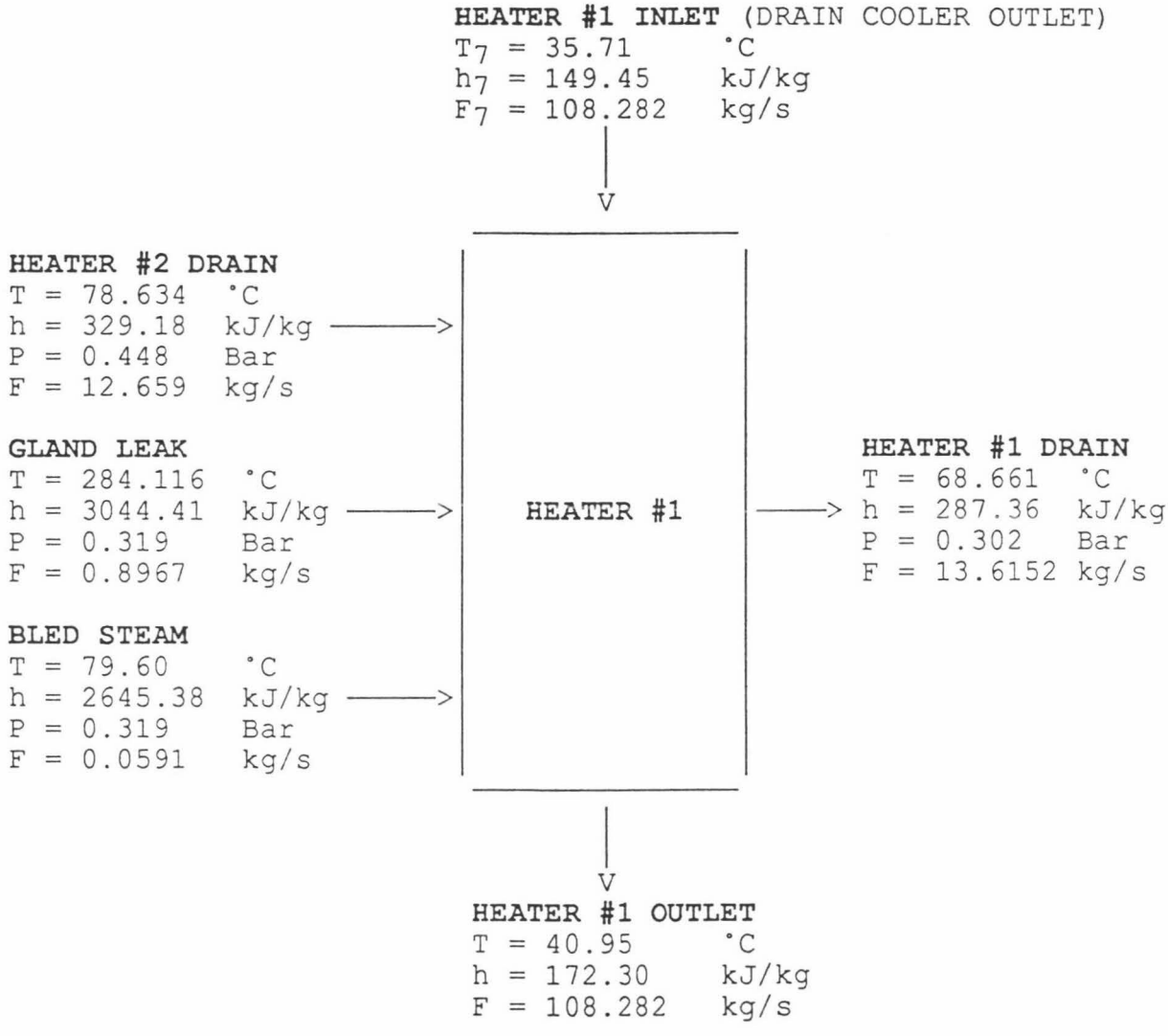
From steam table (J R Cooper And E J Le Fevre)

$$T_7 = 35.71 \text{ °C}$$

Therefore, we have

T_7	= 35.71	°C
h_7	= 149.45	kJ/kg
F_7	= 108.282	kg/s

1.3.2.8 CALCULATION OF MAIN STREAM PROPERIES AFTER IT HAS BEEN PASSED THROUGH THE HEATER #1



Calculation of the heat needed to heat up the feed water

$$F * \delta h = \delta H$$

where δH is the heat content

so

$$\delta H = 108.282 * (172.30 - 149.45)$$
$$= 2475 \text{ kW}$$

Calculation of the available heat from

1. Heater #2 drain

$$\delta H = 12.6594 * (329.18 - 287.36)$$
$$= 529 \text{ kW}$$

2. Bled steam

$$\delta H = 0.0591 * (2645.38 - 287.36)$$
$$= 139 \text{ kW}$$

This means that we only need

(2475 - 529 - 139) = 1807 kW of heat to heat the feed water to its required temperature.

and we have from Gland leak to Heater #1

$$\delta H = 0.8967 * (3044.41 - 287.36)$$
$$= 2472 \text{ kW}$$

Therefore we can reduce flowrate from Gland leak and thus increase the power output.

The saving in steam flow from Gland leak will be

$$F = \frac{(2472 - 1807)}{(3044.41 - 287.36)} = 0.24 \text{ kg/s}$$

Now we can reduce flow to Heater #1 by 0.24 kg/s and increase the flow through turbines the same amount to generate more electicity.

GLAND LEAK			TURBINE EXHAUST	
T = 284.116	°C	Expand to	T = 26.102	°C
h = 3044.41	kJ/kg	——————————>	h = 2396.86	kJ/kg
P = 0.319	Bar		P = 0.034	Bar
F = 0.24	kg/s		F = 0.24	kg/s

Extra power produced will be

$$0.24 * (3044.41 - 2396.86) = 155 \text{ kW}$$

and we need about 70 kW to drive the pump

Therefore the net increase in power output will be **85 kW** (i.e. 0.0567%).

APPENDIX A6

CALCULATION OF THE SAVING IN FINANCIAL TERMS

If we decide to go ahead with the modification as shown in Figure 30, the following potentials saving could well be realised.

Assume that :

Station load factor	50%
Fuel cost/MWH electricity	$25/MWH

FOR 250 MW POWER OUTPUT

Improved efficiency	0.1184%
Total power output	1000 MW (4 x 250)

thus

Total saving per year =

$$= 1000 \times \frac{50}{100} \times \frac{0.1184}{100} \times \frac{\$25}{MWH} \times 8760 \text{ hours}$$

$$= \$ \ 129 \ 648 \text{ per year}$$

FOR 200 MW POWER OUTPUT

Improved efficiency	0.044%
Total power output	800 MW (4 x 200)

thus

Total saving per year =

$$= 800 \times \frac{50}{100} \times \frac{0.044}{100} \times \frac{\$25}{MWH} \times 8760 \text{ hours}$$

$$= \$ \ 38\ 544 \text{ per year}$$

FOR 150 MW POWER OUTPUT

Improved efficiency	0.0567%
Total power output	600 MW (4 x 150)

thus

Total saving per year =

$$= 600 \times \frac{50}{100} \times \frac{0.0567}{100} \times \frac{\$25}{MWH} \times 8760 \text{ hours}$$

$$= \$ \ 37\ 251 \text{ dollars}$$

APPENDIX A7

1.0 CALCULATION OF THE INCREASE IN EFFICIENCY AS THE RESULT OF AN EXTRA ADDITION OF REGENERATIVE CYCLE

1.1.0 250 MW POWER OUTPUT

1.1.1 CALCULATION OF THE EFFICIENCY BEFORE THE MODIFICATION

Refer to Figure 34.

We have

F_1	= 205.870	kg/s	h_1	= 1086.81	kJ/kg	h_9	= 2721.07	kJ/kg
F_2	= 18.187	kg/s	h_2	= 3401.34	kJ/kg	h_{10}	= 2606.34	kJ/kg
F_3	= 8.535	kg/s	h_3	= 3059.07	kJ/kg	h_{11}	= 2338.58	kJ/kg
F_4	= 9.458	kg/s	h_4	= 3533.82	kJ/kg	h_{12}	= 133.12	kJ/kg
F_5	= 7.150	kg/s	h_5	= 3341.84	kJ/kg			
F_6	= 6.576	kg/s	h_6	= 3154.02	kJ/kg			
F_7	= 6.316	kg/s	h_7	= 2962.65	kJ/kg			
F_8	= 9.760	kg/s	h_8	= 2843.66	kJ/kg			

and

$F_a = F_1-F_2$	=	187.683	kg/s
$F_b = F_1-F_2-F_3$	=	179.148	kg/s
$F_c = F_1-F_2-F_3-F_4$	=	169.690	kg/s
$F_d = F_1-F_2-F_3-F_4-F_5$	=	162.540	kg/s
$F_e = F_1-F_2-F_3-F_4-F_5-F_6$	=	155.964	kg/s
$F_f = F_1-F_2-F_3-F_4-F_5-F_6-F_7$	=	149.648	kg/s
$F_g = F_1-F_2-F_3-F_4-F_5-F_6-F_7-F_8$	=	140.014	kg/s

Now

The heat added to the cycle is

$$Q_{in} = F_1*(h_2-h_1) + F_a*(h_4-h_3)$$

thus $Q_{in} = 565.6$ MW

and the work of the turbines is

$$W_{out} = F_1*(h_2-h_3) + F_a*(h_4-h_5) + F_b*(h_5-h_6) + F_c*(h_6-h_7) + F_d*(h_7-h_8) + F_e*(h_8-h_9) + F_f*(h_9-h_{10}) + F_g*(h_{10}-h_{11})$$

which assumes that the pump work has been negleted.

thus $W_{out} = 265.7$ MW

The cycle efficiency is

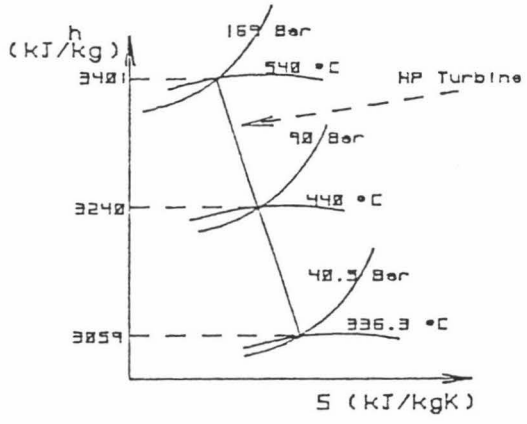
$$\eta = \frac{W_{out}}{Q_{in}} \times 100\%$$

thus $\eta = 46.97\%$

1.1.2 FINDING THE BLED STEAM PROPERTIES THAT USED TO HEAT UP THE EXTRA HEATER

Assume that the steam used is bled from about the middle of the high pressure turbine.

Using enthalpy-entropy diagram for steam (R.W. Haywood & J.H. Mattewman),



We found the bled steam properties are as follows:

P = 90 Bar
T = 440 °C
h = 3240 kJ/kg
F = F_{2a} kg/s

1.1.3 CALCULATION OF THE BLED STEAM FLOWRATE

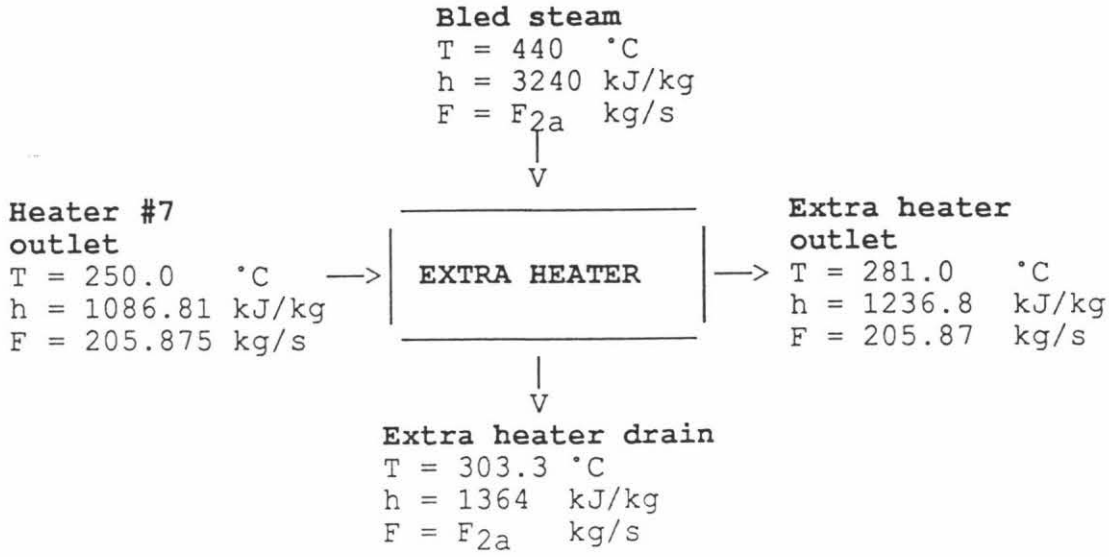
Assume that :

1. the drain of the extra heater is a saturated liquid.
   Therefore, the drain properties are :

   T = 303.3 °C
   h = 1364 kJ/kg
   F = F_{2a} kg/s

2. the outlet temperature of the extra heater is the same as the economiser outlet temperature.
   Therefore, the outlet properties are:

   T = 281.0 °C
   h = 1236.8 kJ/kg
   F = 205.87 kg/s



Using enthalpy balance, we have

$205.875 * (1236.8 - 1086.81) = F * (3240 - 1364)$

$F = 16.46$ kg/s

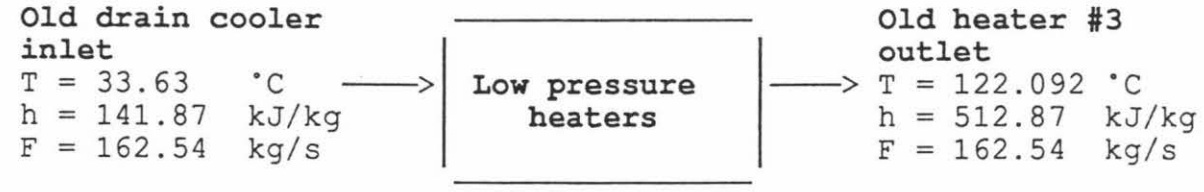
1.1.4 CALCULATION OF THE NEW MAIN STREAM PROPERTIES AFTER IT HAS BEEN PASSED THROUGH LOW PRESSURE HEATERS

The temperature of the main stream would be higher than before the extra heater was added. This was due the reduction in the main cold stream flowrate by 16.46 kg/s while hot streams were still giving up the same amount of heat. And also because the drain from the extra heater would be cascaded down through the high pressure heaters to the deaerator.

In practice of course we would rather reduce the hot stream flowrate so that the temperature of the main cold stream remains the same as before. This is because the δT of the heaters were already small. And if we increase the temperature of the cold stream and keep the hot stream temperature constant, we might end up cooling the cold stream down instead of heating it up. But whichever approach is chosen the increase in efficiency is the

same, the approach needing the least complex calculation is chosen.

The heat content of the hot streams of the low pressure heaters before the modification is



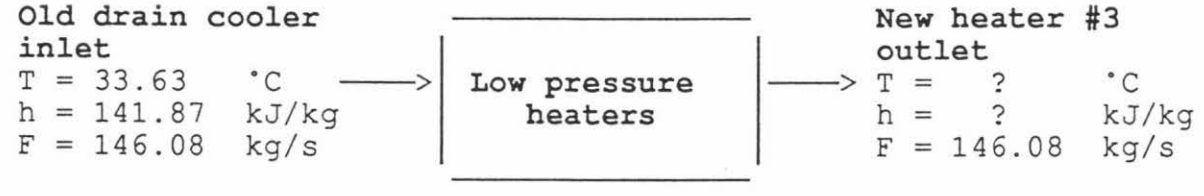
so

$$\delta h = 162.54 * (512.87 - 141.87)$$
$$= 60.30 \text{ MW}$$

Assume that :

1. the heat content from the hot stream remain the same after modification.
2. the drain cooler inlet temperature is the same before and after the modification.

Now we still have 60.30 MW of heat from hot streams, but the cold stream flow is reduced by 16.46 kg/s. The new cold stream properties will be :



Using enthalpy balance,

$$60.30 * 10^3 = (h - 141.87) * 146.08$$

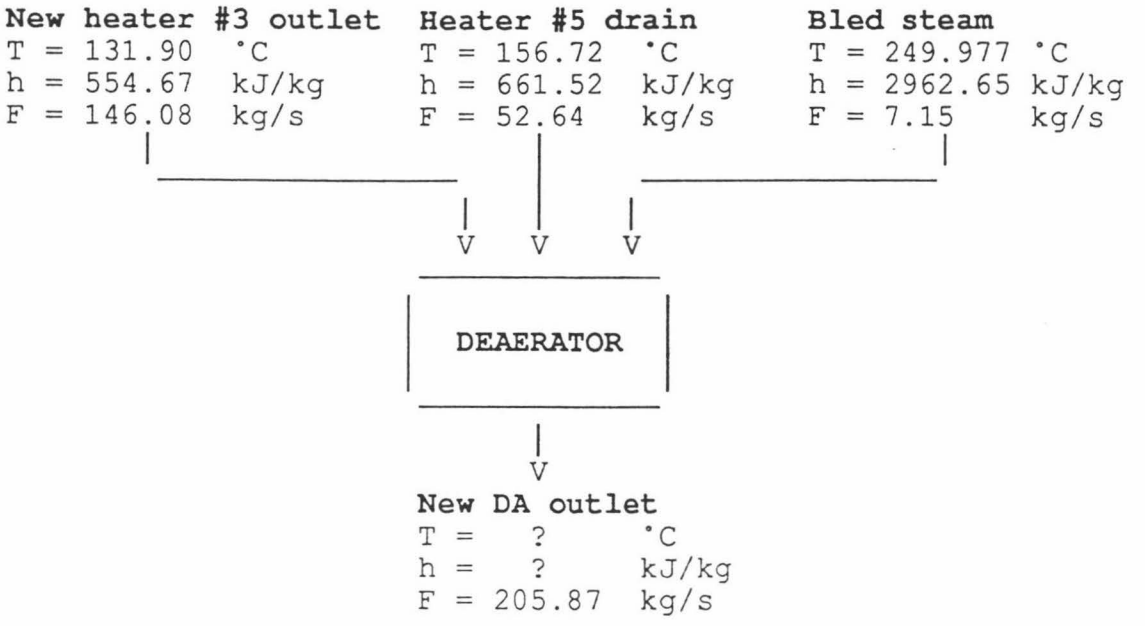
$$h = 554.67 \text{ kJ/kg}$$

$$T = 131.90 \text{ °C} \quad \text{(from steam table)}$$

1.1.5 CALCULATION OF THE NEW MAIN STREAM PROPERTIES AFTER IT HAS BEEN PASSED THROUGH DEAERATOR

Assume that :

1. The bled steam to DA is the same as before.
2. The heater #5 drain to DA is the same as before except that now the flow is increased by 16.46 kg/s



Enthalpy balance,

(554.67 * 146.08) + (661.52 * 52.64) + (2962.65 * 7.15) = 205.87 * h

Therefore

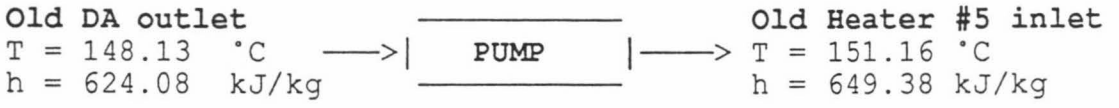
h = 665.62 kJ/kg

T = 157.7 °C (from steam table)

1.1.6 CALCULATION OF THE NEW MAIN STREAM PROPERTIES AFTER IT HAS BEEN PASSED THROUGH THE PUMP

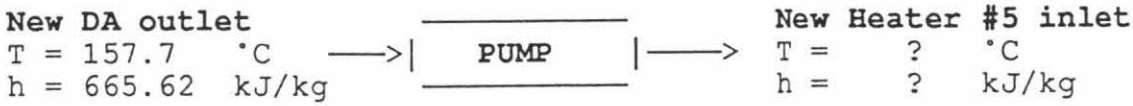
Assume that the increase in enthaply in the pump is the same before and after the modification.

Increased in enthalpy before the modification



Therefore $\delta h = 649.38 - 624.08 = 25.3$ kJ/kg

Now



Therefore

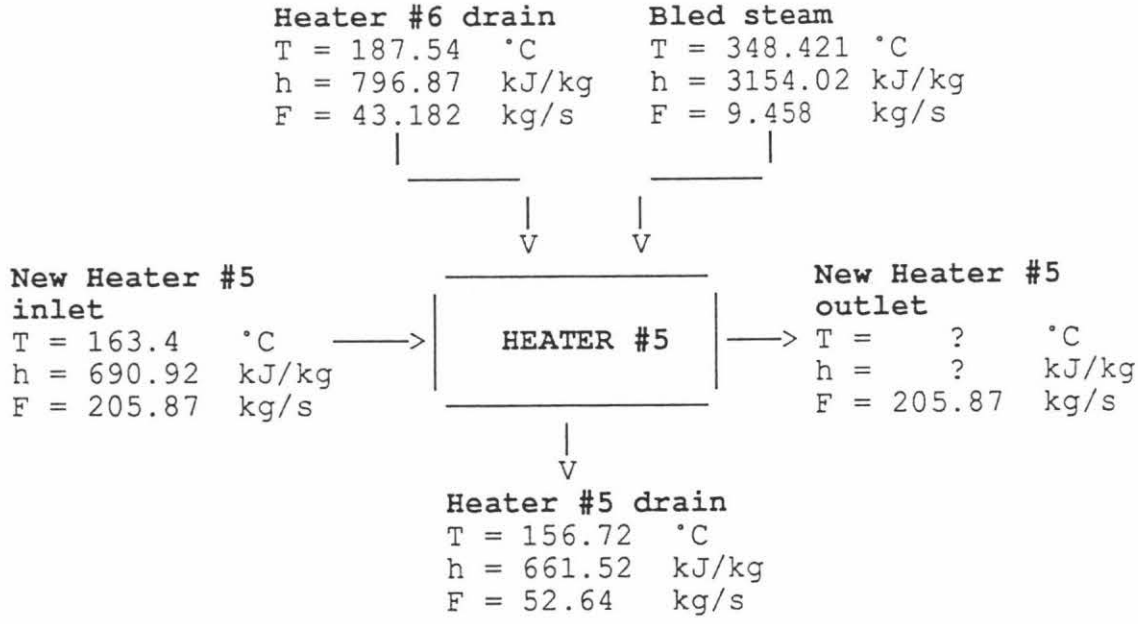
$$h = 665.62 + 25.3 = 660.92 \text{ kJ/kg}$$

$$T = 163.4 \text{ °C (from steam table)}$$

1.1.7 CALCULATION OF THE NEW MAIN STREAM PROPERTIES AFTER IT HAS BEEN PASSED THROUGH THE HEATER #5

Assume that :

1. The bled steam to heater #5 is the same as before.
2. The heater #6 drain to Heater #5 and the heater #5 drain are the same as before except that now the flow is increased by 16.46 kg/s.



Enthalpy balance,

$$9.458 * (3154.02 - 661.52) + 43.182 * (796.87 - 661.52) = 205.87 * (h - 690.92)$$

Therefore

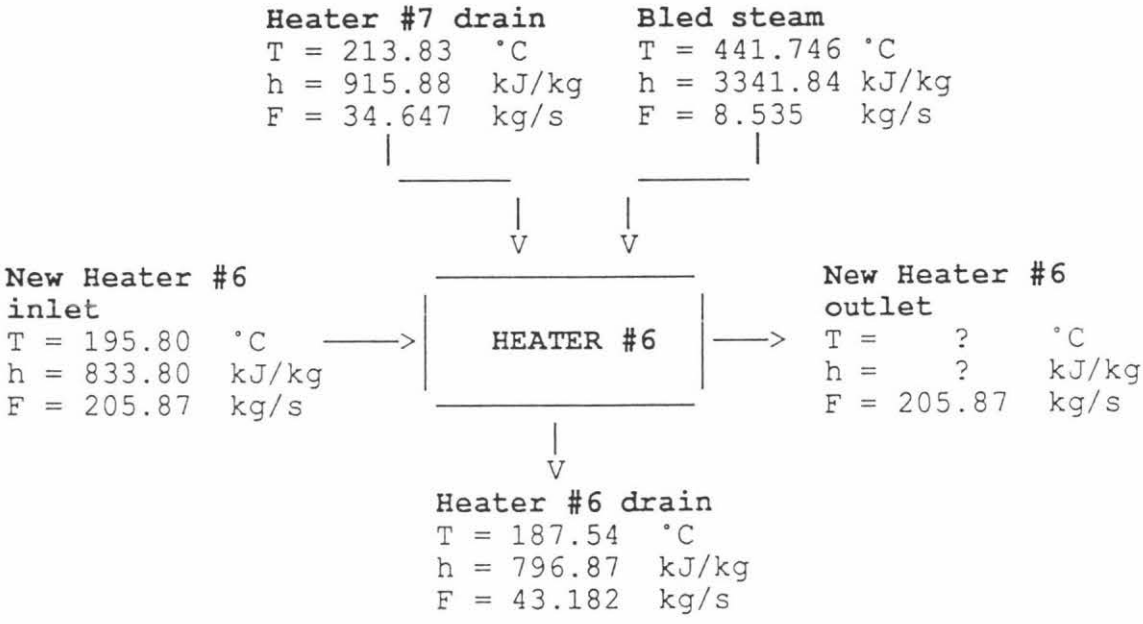
$$h = 833.8 \text{ kJ/kg}$$

$$T = 195.8 \text{ °C (from steam table)}$$

1.1.8 CALCULATION OF THE NEW MAIN STREAM PROPERTIES AFTER IT HAS BEEN PASSED THROUGH THE HEATER #6

Assume that :

1. The bled steam to heater #6 is the same as before.
2. The heater #7 drain to Heater #6 and the heater #6 drain are the same as before except that now the flow is increased by 16.46 kg/s.



Enthalpy balance,

$8.535 * (3341.84 - 796.87) + 34.647 * (915.88 - 796.87) = 205.87 * (h - 833.8)$

Therefore

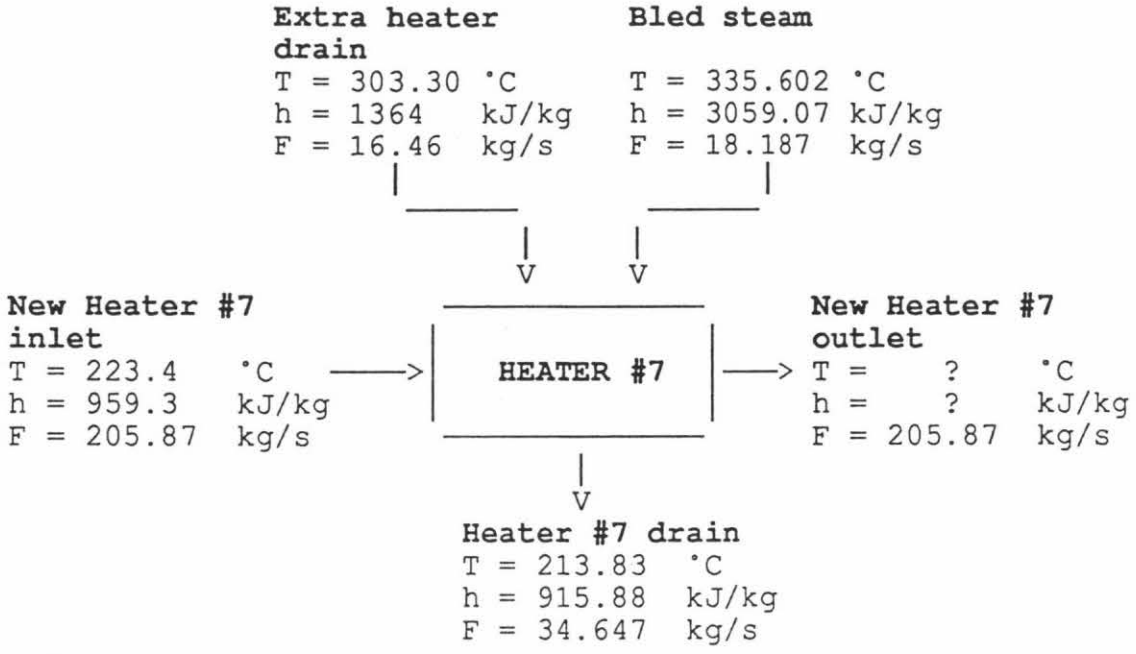
$h = 959.3$ kJ/kg

$T = 223.4$ °C (from steam table)

1.1.9 CALCULATION OF THE NEW MAIN STREAM PROPERTIES AFTER IT HAS BEEN PASSED THROUGH THE HEATER #7

Assume that :

1. The bled steam to heater #7 is the same as before.
2. The extra heater drain to heater #7 is the same as before.
3. The heater #7 drain is the same as before except that now the flow is increased by 16.46 kg/s.



Enthalpy balance,

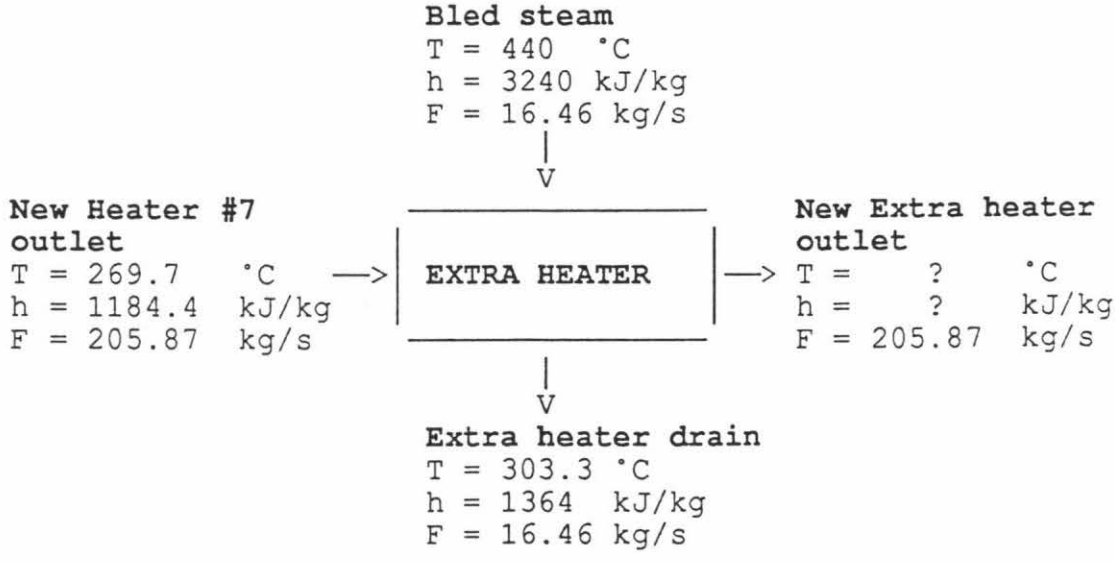
$$16.46 * (1364 - 915.88) + 18.187 * (3059.07 - 915.88) = 205.87 * (h - 959.3)$$

Therefore

$h = 1184.4$ kJ/kg

$T = 269.7$ °C (from steam table)

1.1.10 CALCULATION OF THE NEW MAIN STREAM PROPERTIES AFTER IT HAS BEEN PASSED THROUGH THE EXTRA HEATER



Enthalpy balance,

$16.46 * (3240 - 1364) = 205.87 * (h - 1184.4)$

Therefore

$h = 1334.4$ kJ/kg

$T = 298$ °C (from steam table)

1.1.11 CALCULATION OF THE EFFICIENCY AFTER THE MODIFICATION

Refer to Figure 35.

We have

F_1	= 205.87	kg/s	h_1	= 1086.81	kJ/kg	h_9	= 2721.07	kJ/kg
F_{2a}	= 16.460	kg/s	h_{2a}	= 3240.00	kJ/kg	h_{10}	= 2606.34	kJ/kg
F_2	= 18.187	kg/s	h_2	= 3401.34	kJ/kg	h_{11}	= 2338.58	kJ/kg
F_3	= 8.535	kg/s	h_3	= 3059.07	kJ/kg	h_{12}	= 133.12	kJ/kg
F_4	= 9.458	kg/s	h_4	= 3533.82	kJ/kg			
F_5	= 7.150	kg/s	h_5	= 3341.84	kJ/kg			
F_6	= 6.576	kg/s	h_6	= 3154.02	kJ/kg			
F_7	= 6.316	kg/s	h_7	= 2962.65	kJ/kg			
F_8	= 9.760	kg/s	h_8	= 2843.66	kJ/kg			

and

F_{1a}	$= F_1 - F_{2a}$	= 189.4100	kg/s
F_a	$= F_1 - F_{2a} - F_2$	= 171.2228	kg/s
F_b	$= F_1 - F_{2a} - F_2 - F_3$	= 162.6928	kg/s
F_c	$= F_1 - F_{2a} - F_2 - F_3 - F_4$	= 148.7661	kg/s
F_d	$= F_1 - F_{2a} - F_2 - F_3 - F_4 - F_5$	= 141.6159	kg/s
F_e	$= F_1 - F_{2a} - F_2 - F_3 - F_4 - F_5 - F_6$	= 135.0399	kg/s
F_f	$= F_1 - F_{2a} - F_2 - F_3 - F_4 - F_5 - F_6 - F_7$	= 128.7233	kg/s
F_g	$= F_1 - F_{2a} - F_2 - F_3 - F_4 - F_5 - F_6 - F_7 - F_8$	= 118.9633	kg/s

Now

The new heat added to the cycle is

New $Q_{in} = F_1 * (h_2 - h_1) + F_a * (h_4 - h_3)$

thus New $Q_{in} = 506.8$ MW

and new the work of the turbines is

$$\text{New } W_{out} = F_1*(h_2-h_{2a}) + F_{1a}*(h_{2a}-h_3) + F_a*(h_4-h_5) + F_b*(h_5-h_6) + F_c*(h_6-h_7) + F_d*(h_7-h_8) + F_e*(h_8-h_9) + F_f*(h_9-h_{10}) + F_g*(h_{10}-h_{11})$$

which assumes that the pump work has been negleted.

thus New W_{out} = 239.38 MW

The new steam cycle efficiency is

$$\text{New } \eta = \frac{\text{New } W_{out}}{\text{New } Q_{in}} \times 100\%$$

thus New η = 47.23%

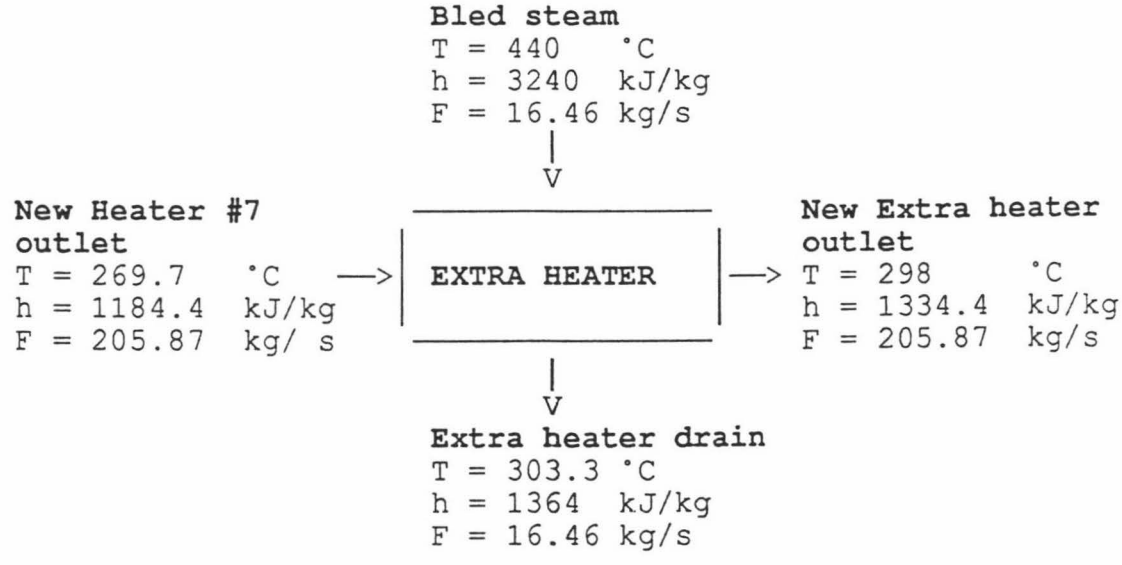
The increased in efficiency is

47.23% - 46.97% = **0.26%**

The reduction in overall power output is

265.7 - 239.38 = **26.32 MW** (i.e. 10.5%)

1.1.12 CALCULATION OF THE AREA REQUIREMENT



The heat flow across the heater is

$$\phi = UA\ \delta T_{LM}$$

We have

$$\phi = (3240 - 1364) * 16.46$$

$$= 30.88\ MW$$

and

$$\delta T_{LM} = \frac{(440 - 298) - (303.3 - 269.7)}{\ln [(440 - 298) / (303.3 - 269.7)]}$$

$$= 75.2\ ^{\circ}C$$

Thus $$UA = \frac{30.88 \times 10^{6}}{75.2}$$

$$= 410.63\ kW/^{\circ}C$$

1.2.0 200 MW POWER OUTPUT

1.2.1 CALCULATION OF THE EFFICIENCY BEFORE THE MODIFICATION

Refer to Figure 34.

We have

F_1	= 172.615	kg/s	h_1	= 1027.84	kJ/kg	h_9	= 2732.09	kJ/kg
F_2	= 13.264	kg/s	h_2	= 3425.36	kJ/kg	h_{10}	= 2636.60	kJ/kg
F_3	= 7.513	kg/s	h_3	= 3087.49	kJ/kg	h_{11}	= 2411.39	kJ/kg
F_4	= 7.931	kg/s	h_4	= 3556.07	kJ/kg	h_{12}	= 123.12	kJ/kg
F_5	= 4.139	kg/s	h_5	= 3341.94	kJ/kg			
F_6	= 6.134	kg/s	h_6	= 3154.62	kJ/kg			
F_7	= 6.021	kg/s	h_7	= 2954.48	kJ/kg			
F_8	= 6.307	kg/s	h_8	= 2839.65	kJ/kg			

and

$F_a = F_1-F_2$	=	159.351	kg/s
$F_b = F_1-F_2-F_3$	=	151.838	kg/s
$F_c = F_1-F_2-F_3-F_4$	=	143.907	kg/s
$F_d = F_1-F_2-F_3-F_4-F_5$	=	139.768	kg/s
$F_e = F_1-F_2-F_3-F_4-F_5-F_6$	=	133.636	kg/s
$F_f = F_1-F_2-F_3-F_4-F_5-F_6-F_7$	=	127.613	kg/s
$F_g = F_1-F_2-F_3-F_4-F_5-F_6-F_7-F_8$	=	121.306	kg/s

Now

The heat added to the cycle is

$$Q_{in} = F_1*(h_2-h_1) + F_a*(h_4-h_3)$$

thus $Q_{in} = 488.5$ MW

and the work of the turbines is

$$W_{out} = F_1*(h_2-h_3) + F_a*(h_4-h_5) + F_b*(h_5-h_6) + F_c*(h_6-h_7) + F_d*(h_7-h_8) + F_e*(h_8-h_9) + F_f*(h_9-h_{10}) + F_g*(h_{10}-h_{11})$$

which assumes that the pump work has been negleted.

thus $W_{out} = 221.5$ MW

The cycle efficiency is

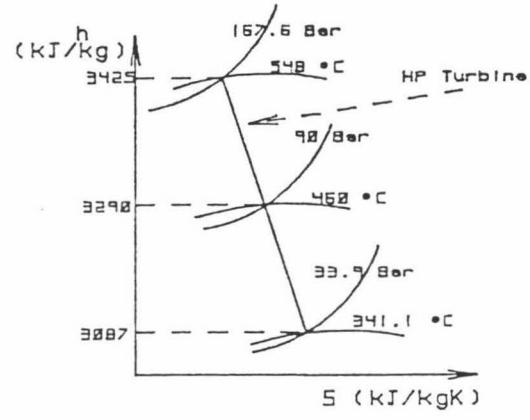
$$\eta = \frac{W_{out}}{Q_{in}} \times 100\%$$

thus $\eta = 45.34\%$

1.2.2 FINDING THE BLED STEAM PROPERTIES THAT USED TO HEAT UP THE EXTRA HEATER

Assume that the steam used i bled from about the middle of the high pressure turbine.

Using enthalpy-entropy diagram for steam (R.W. Haywood & J.H. Mattewman),



We found the bled steam properties as follows:

P = 90 Bar
T = 460 °C
h = 3290 kJ/kg
F = F_{2a} kg/s

1.2.3 CALCULATION OF THE BLED STEAM FLOWRATE

Assume that :

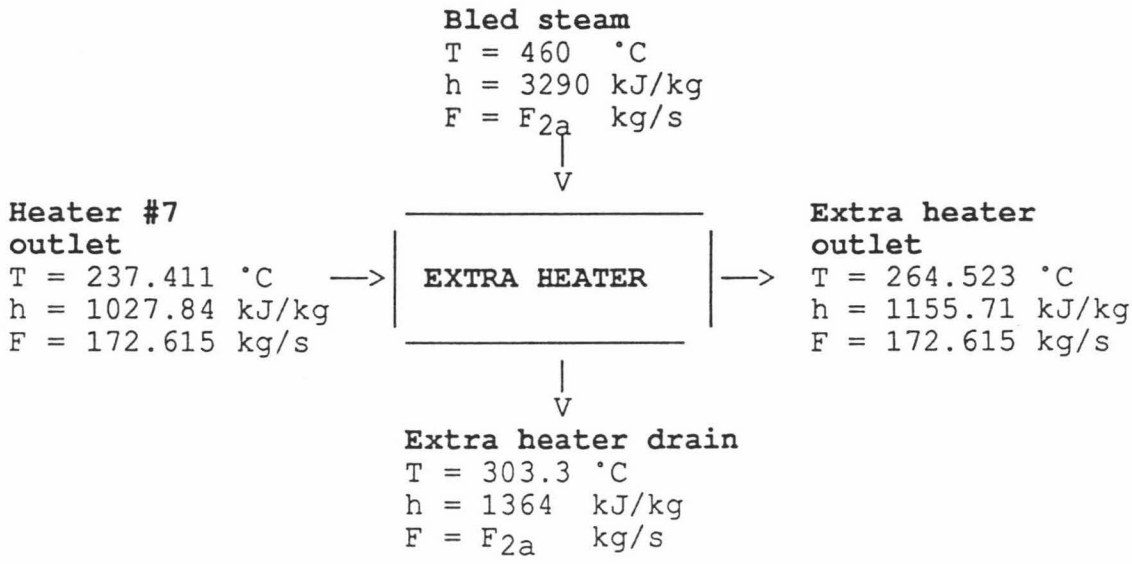
1. the drain of the extra heater is a saturated liquid.
   Therefore, the drain properties are :

   T = 303.3 °C
   h = 1364 kJ/kg
   F = F_{2a} kg/s

2. the outlet temperature of the extra heater is the same as the economiser outlet temperature.
   Therefore, the outlet properties are:

   T = 264.523 °C
   h = 1155.71 kJ/kg
   F = 172.615 kg/s

Therefore



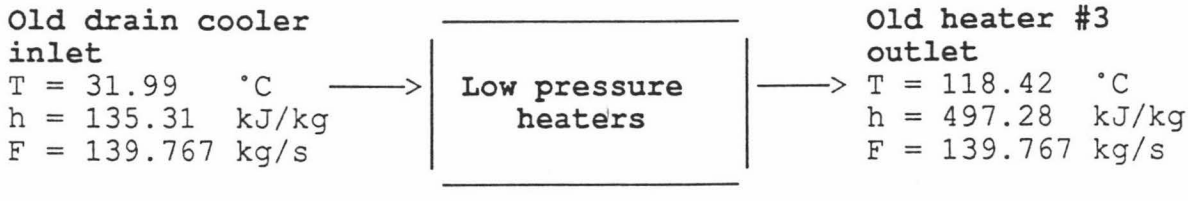
Using enthalpy balance, we have

$$172.615 * (1155.71 - 1027.84) = F * (3290 - 1364)$$

$$F = 11.46 \text{ kg/s}$$

1.2.4 CALCULATION OF THE NEW MAIN STREAM PROPERTIES AFTER IT HAS BEEN PASSED THROUGH LOW PRESSURE HEATERS

The heat content of the hot streams of low pressure heaters before the modification is



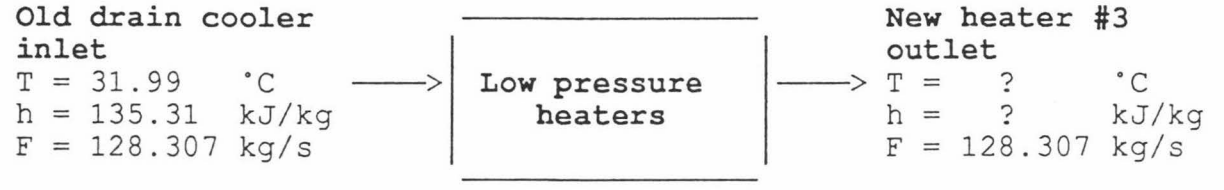
so

$$\delta h = 139.767 * (497.28 - 135.31)$$
$$= 50.59 \text{ MW}$$

Assume that :
1. the heat content from the hot stream remain the same after modification.

2. the drain cooler inlet temperature is the same before and after the modification.

Now we still have 50.59 MW of heat from hot streams, but the cold stream flow is reduce by 11.46 kg/s. The new cold stream properties will be :



Using enthalpy balance,

$$50.59 * 10^3 = (h - 135.31) * 128.307$$

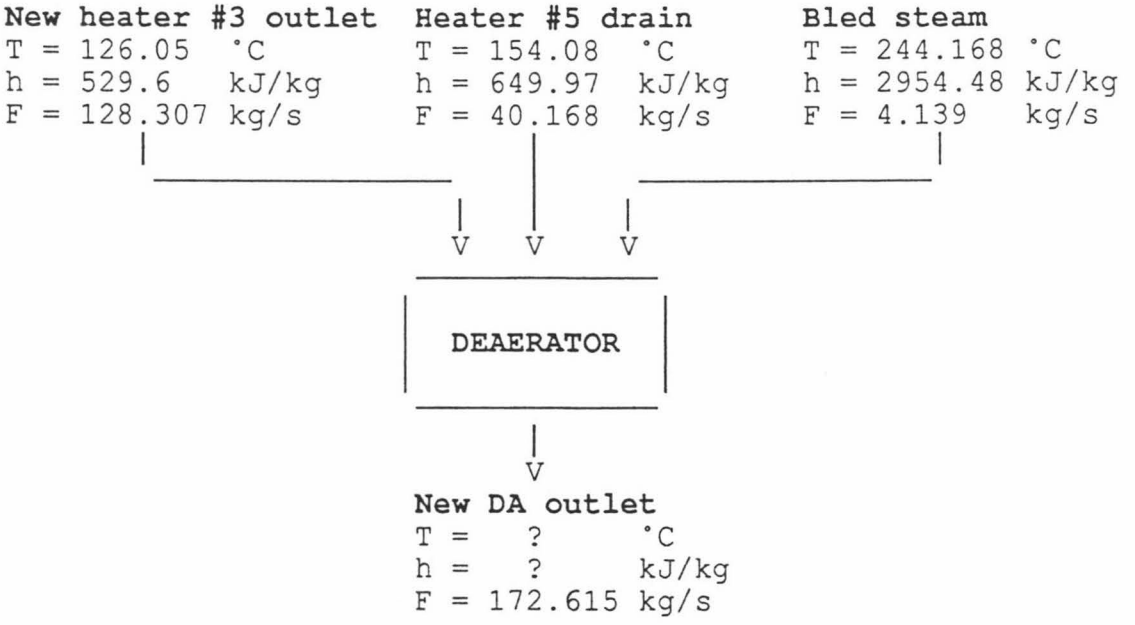
$$h = 529.6 \text{ kJ/kg}$$

$$T = 126.05 \text{ °C} \quad \text{(from steam table)}$$

1.2.5 CALCULATION OF THE NEW MAIN STREAM PROPERTIES AFTER IT HAS BEEN PASSED THROUGH DEAERATOR

Assume that :

1. The bled steam to DA is the same as before.
2. The heater #5 drain to DA is the same as before except that now the flow is increased by 11.46 kg/s



Enthalpy balance,

(529.6 * 128.307) + (649.97 * 40.168) + (2954.48 * 4.139) = 172.615 * h

Therefore

h = 615.75 kJ/kg

T = 146.19 °C (from steam table)

1.2.6 CALCULATION OF THE NEW MAIN STREAM PROPERTIES AFTER IT HAS BEEN PASSED THROUGH THE PUMP

Assume that the increase in enthaply in the pump is the same before and after the modification.

Increased in enthalpy before the modification

Old DA outlet ——————— **Old Heater #5 inlet**
T = 138.25 °C ——>| **PUMP** |——> T = 141.647 °C
h = 581.6 kJ/kg ——————— h = 608.29 kJ/kg

Therefore δh = 608.29 - 581.6 = 26.69 kJ/kg

Now

New DA outlet ——————— **New Heater #5 inlet**
T = 146.19 °C ——>| **PUMP** |——> T = ? °C
h = 615.75 kJ/kg ——————— h = ? kJ/kg

Therefore

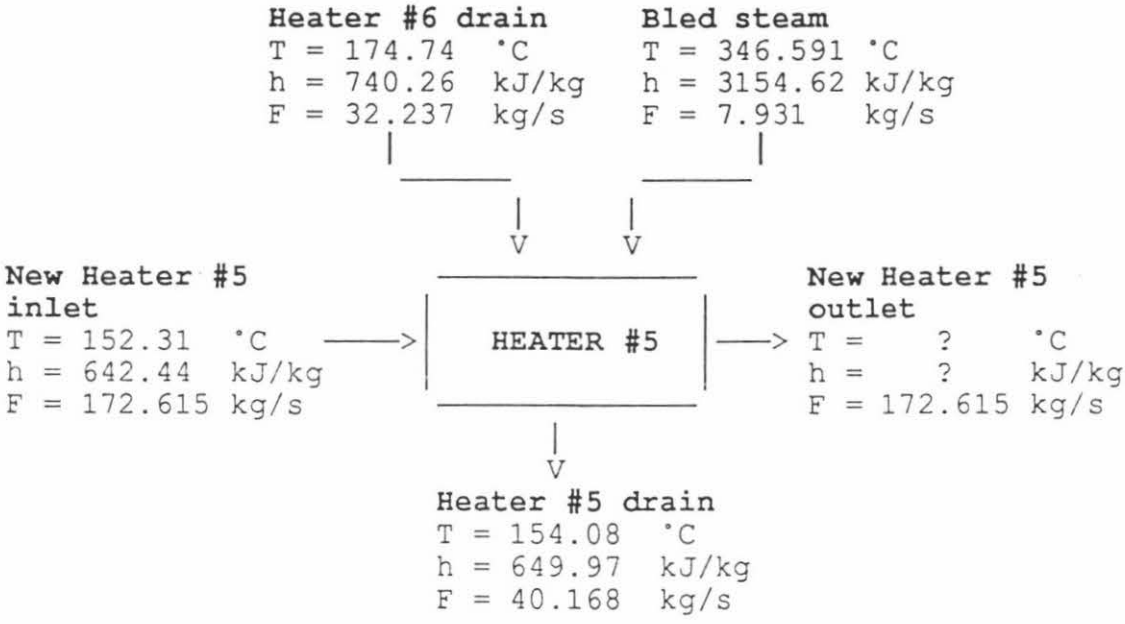
h = 615.75 + 26.69 = 642.44 kJ/kg

T = 152.31 °C (from steam table)

1.2.7 CALCULATION OF THE NEW MAIN STREAM PROPERTIES AFTER IT HAS BEEN PASSED THROUGH THE HEATER #5

Assume that :

1. The bled steam to heater #5 is the same as before.
2. The heater #6 drain to Heater #5 and the heater #5 drain are the same as before except that now the flow is increased by 11.46 kg/s.



Enthalpy balance,

$$7.931 * (3154.62 - 649.97) + 32.237 * (740.26 - 649.97) = 172.615 * (h - 642.44)$$

Therefore

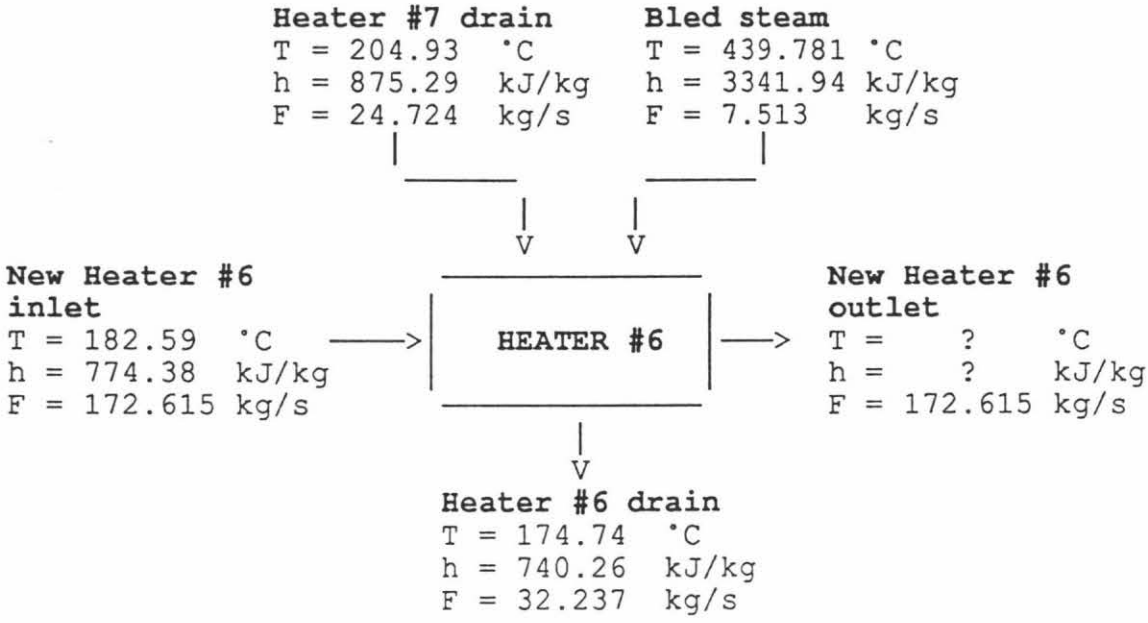
$h = 774.38$ kJ/kg

$T = 182.59$ °C (from steam table)

1.2.8 CALCULATION OF THE NEW MAIN STREAM PROPERTIES AFTER IT HAS BEEN PASSED THROUGH THE HEATER #6

Assume that :

1. The bled steam to heater #6 is the same as before.
2. The heater #7 drain to Heater #6 and the heater #6 drain are the same as before except that now the flow is increased by 11.46 kg/s.



Enthalpy balance,

$$7.513 * (3341.94 - 740.26) + 24.724 * (875.29 - 740.26) = 172.615 * (h - 774.38)$$

Therefore

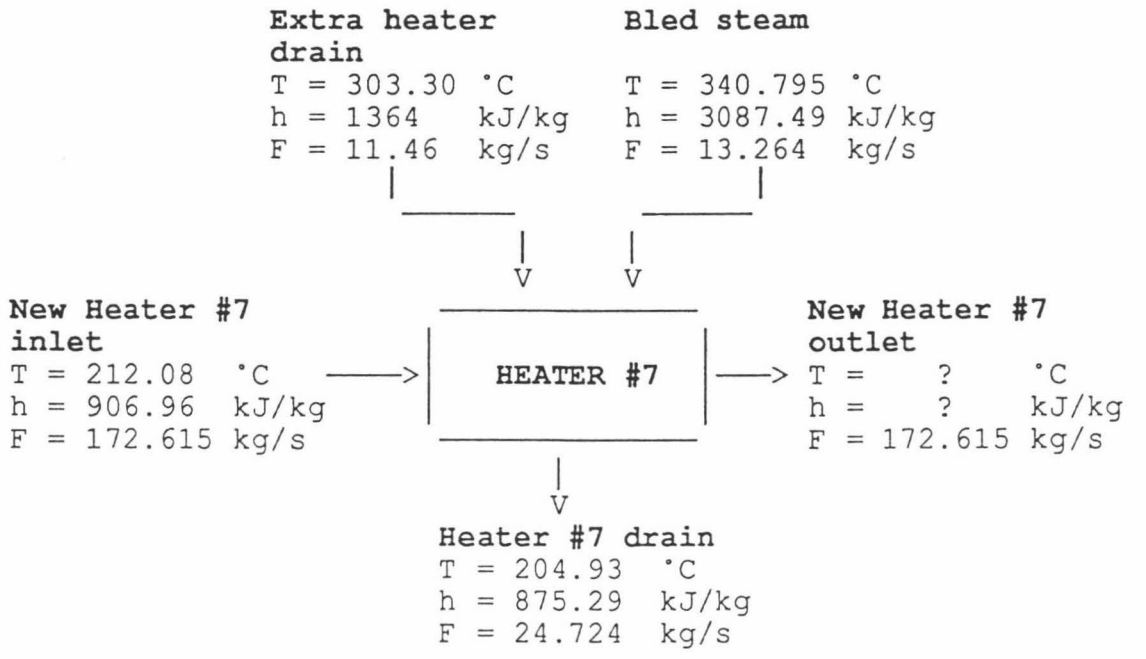
$$h = 906.96 \text{ kJ/kg}$$

$$T = 212.08 \text{ °C (from steam table)}$$

1.2.9 CALCULATION OF THE NEW MAIN STREAM PROPERTIES AFTER IT HAS BEEN PASSED THROUGH THE HEATER #7

Assume that :

1. The bled steam to heater #7 is the same as before.
2. The extra heater drain to heater #7 is the same as before.
3. The heater #7 drain is the same as before except that now the flow is increased by 11.46 kg/s.



Enthalpy balance,

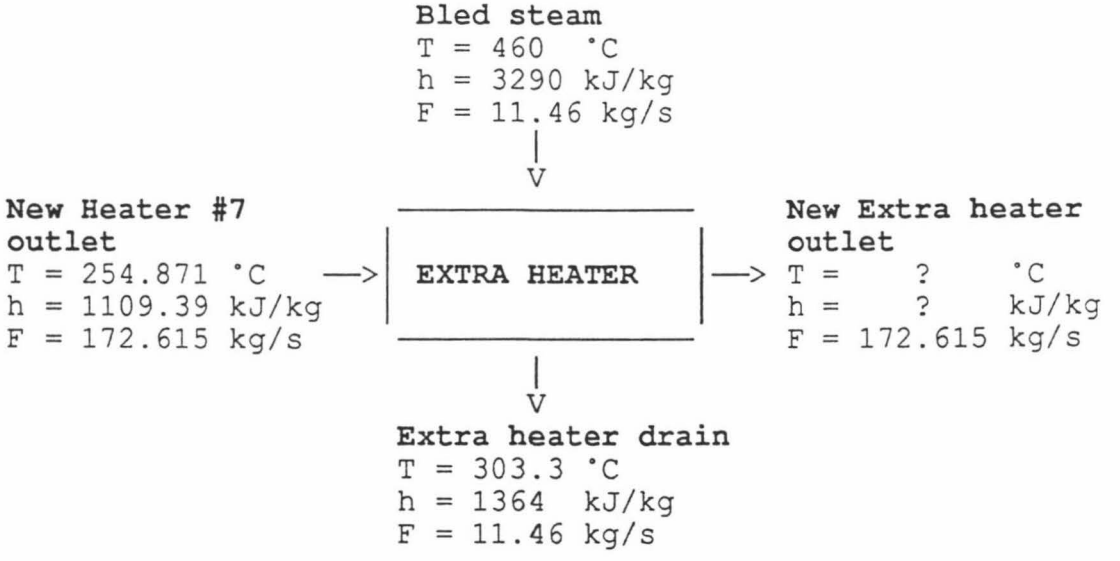
$$11.46 * (1364 - 875.29) + 13.264 * (3087.49 - 875.29) = 172.615 * (h - 906.96)$$

Therefore

$h = 1109.39$ kJ/kg

$T = 254.87$ °C (from steam table)

1.2.10 CALCULATION OF THE NEW MAIN STREAM PROPERTIES AFTER IT HAS BEEN PASSED THROUGH THE EXTRA HEATER



Enthalpy balance,

$11.46 * (3290 - 1364) = 172.615 * (h - 1109.39)$

Therefore

$h = 1237.25$ kJ/kg

$T = 280.07$ °C (from steam table)

1.2.11 CALCULATION OF THE EFFICIENCY AFTER THE MODIFICATION

Refer to Figure 35.

We have

F_1	= 172.615	kg/s	h_1	= 1237.25	kJ/kg	h_9	= 2732.09	kJ/kg
F_{2a}	= 11.460	kg/s	h_{2a}	= 3290.00	kJ/kg	h_{10}	= 2636.60	kJ/kg
F_2	= 13.264	kg/s	h_2	= 3425.36	kJ/kg	h_{11}	= 2411.39	kJ/kg
F_3	= 7.513	kg/s	h_3	= 3087.49	kJ/kg	h_{12}	= 123.12	kJ/kg
F_4	= 7.931	kg/s	h_4	= 3556.07	kJ/kg			
F_5	= 4.139	kg/s	h_5	= 3341.94	kJ/kg			
F_6	= 6.134	kg/s	h_6	= 3154.62	kJ/kg			
F_7	= 6.021	kg/s	h_7	= 2954.48	kJ/kg			
F_8	= 6.307	kg/s	h_8	= 2839.65	kJ/kg			

and

$F_{1a} = F_1 - F_{2a}$	=	161.155	kg/s
$F_a = F_1 - F_{2a} - F_2$	=	147.891	kg/s
$F_b = F_1 - F_{2a} - F_2 - F_3$	=	140.378	kg/s
$F_c = F_1 - F_{2a} - F_2 - F_3 - F_4$	=	132.447	kg/s
$F_d = F_1 - F_{2a} - F_2 - F_3 - F_4 - F_5$	=	128.308	kg/s
$F_e = F_1 - F_{2a} - F_2 - F_3 - F_4 - F_5 - F_6$	=	122.174	kg/s
$F_f = F_1 - F_{2a} - F_2 - F_3 - F_4 - F_5 - F_6 - F_7$	=	116.153	kg/s
$F_g = F_1 - F_{2a} - F_2 - F_3 - F_4 - F_5 - F_6 - F_7 - F_8$	=	109.846	kg/s

Now

The new heat added to the cycle is

$$\text{New } Q_{in} = F_1 * (h_2 - h_1) + F_a * (h_4 - h_3)$$

thus New $Q_{in} = 447$ MW

and new the work of the turbines is

$$\text{New } W_{out} = F_1*(h_2-h_{2a}) + F_{1a}*(h_{2a}-h_3) + F_a*(h_4-h_5) + F_b*(h_5-h_6) + F_c*(h_6-h_7) + F_d*(h_7-h_8) + F_e*(h_8-h_9) + F_f*(h_9-h_{10}) + F_g*(h_{10}-h_{11})$$

which assumes that the pump work has been negleted.

thus New W_{out} = 204.16 MW

The new steam cycle efficiency is

$$\text{New } \eta = \frac{\text{New } W_{out}}{\text{New } Q_{in}} \times 100\%$$

thus New η = 45.67%

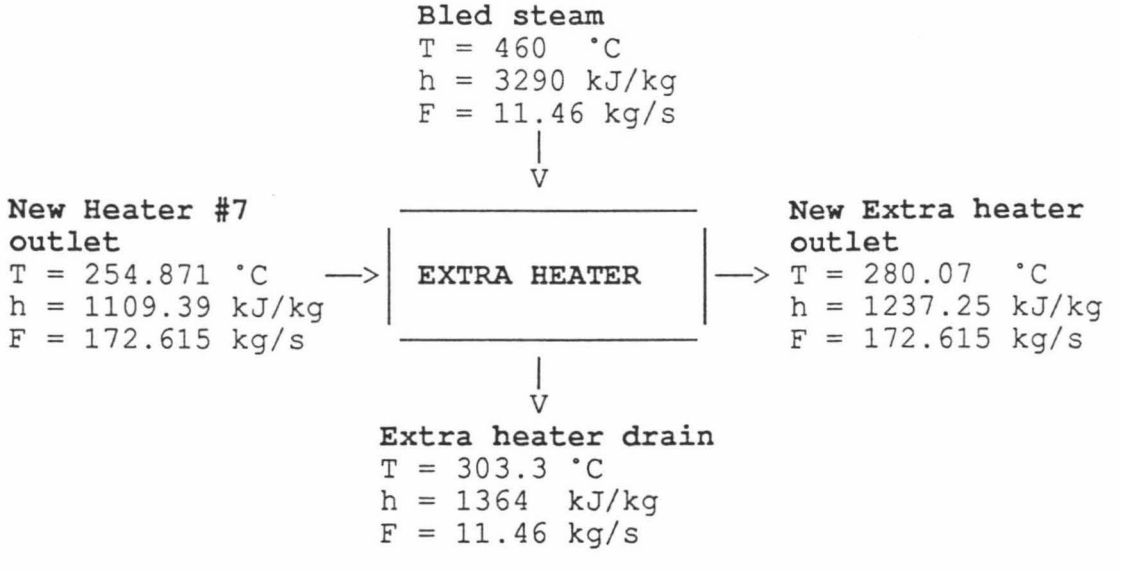
The increased in efficiency is

45.67% - 45.34% = **0.33%**

The reduction in overall power output is

221.5 - 204.67 = **16.83 MW** (i.e. 8.4%)

1.2.12 CALCULATION OF THE AREA REQUIREMENT



The heat flow across the heater is

$$\phi = UA\ \delta T_{LM}$$

We have

$$\phi = (3290 - 1364) * 11.46$$

$$= 22.07\ MW$$

and

$$\delta T_{LM} = \frac{(460 - 280.07) - (303.3 - 254.87)}{\ln [(460 - 280.07) / (303.3 - 254.87)]}$$

$$= 100.19\ ^{\circ}C$$

Thus $$UA = \frac{22.07 \times 10^{6}}{100.19}$$

$$= 220.28\ kW/^{\circ}C$$

1.3.0 150 MW POWER OUTPUT

1.3.1 CALCULATION OF THE EFFICIENCY BEFORE THE MODIFICATION

Refer to Figure 34.

We have

F_1 = 131.832 kg/s	h_1 = 961.01 kJ/kg	h_9 = 2707.24 kJ/kg
F_2 = 9.043 kg/s	h_2 = 3403.00 kJ/kg	h_{10} = 2645.38 kJ/kg
F_3 = 5.477 kg/s	h_3 = 3079.26 kJ/kg	h_{11} = 2431.73 kJ/kg
F_4 = 5.670 kg/s	h_4 = 3521.72 kJ/kg	h_{12} = 109.72 kJ/kg
F_5 = 3.363 kg/s	h_5 = 3324.63 kJ/kg	
F_6 = 5.604 kg/s	h_6 = 3137.12 kJ/kg	
F_7 = 7.056 kg/s	h_7 = 2940.97 kJ/kg	
F_8 = 0.059 kg/s	h_8 = 2821.71 kJ/kg	

and

$F_a = F_1-F_2$	= 122.339	kg/s
$F_b = F_1-F_2-F_3$	= 116.862	kg/s
$F_c = F_1-F_2-F_3-F_4$	= 111.192	kg/s
$F_d = F_1-F_2-F_3-F_4-F_5$	= 107.829	kg/s
$F_e = F_1-F_2-F_3-F_4-F_5-F_6$	= 102.225	kg/s
$F_f = F_1-F_2-F_3-F_4-F_5-F_6-F_7$	= 95.169	kg/s
$F_g = F_1-F_2-F_3-F_4-F_5-F_6-F_7-F_8$	= 95.110	kg/s

Now

The heat added to the cycle is

$Q_{in} = F_1*(h_2-h_1) + F_a*(h_4-h_3)$

thus $Q_{in} = 376.06$ MW

and the work of the turbines is

$$W_{out} = F_1*(h_2-h_3) + F_a*(h_4-h_5) + F_b*(h_5-h_6) + F_c*(h_6-h_7) + F_d*(h_7-h_8) + F_e*(h_8-h_9) + F_f*(h_9-h_{10}) + F_g*(h_{10}-h_{11})$$

which assumes that the pump work has been negleted.

thus $W_{out} = 163.1$ MW

The cycle efficiency is

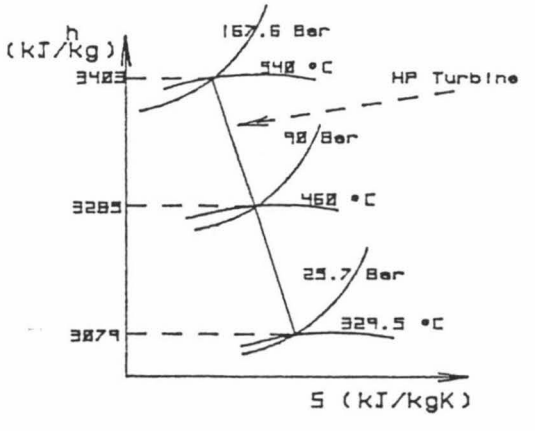
$$\eta = \frac{W_{out}}{Q_{in}} \times 100\%$$

thus $\eta = 43.37\%$

1.3.2 FINDING THE BLED STEAM PROPERTIES THAT USED TO HEAT UP THE EXTRA HEATER

Assume that the steam used is bled from about the middle of the high pressure turbine.

Using enthalpy-entropy diagram for steam (R.W. Haywood & J.H. Mattewman),



We found the bled steam properties as follows:

P = 90 Bar
T = 460 °C
h = 3285 kJ/kg
F = F_{2a} kg/s

1.3.3 CALCULATION OF THE BLED STEAM FLOWRATE

Assume that :

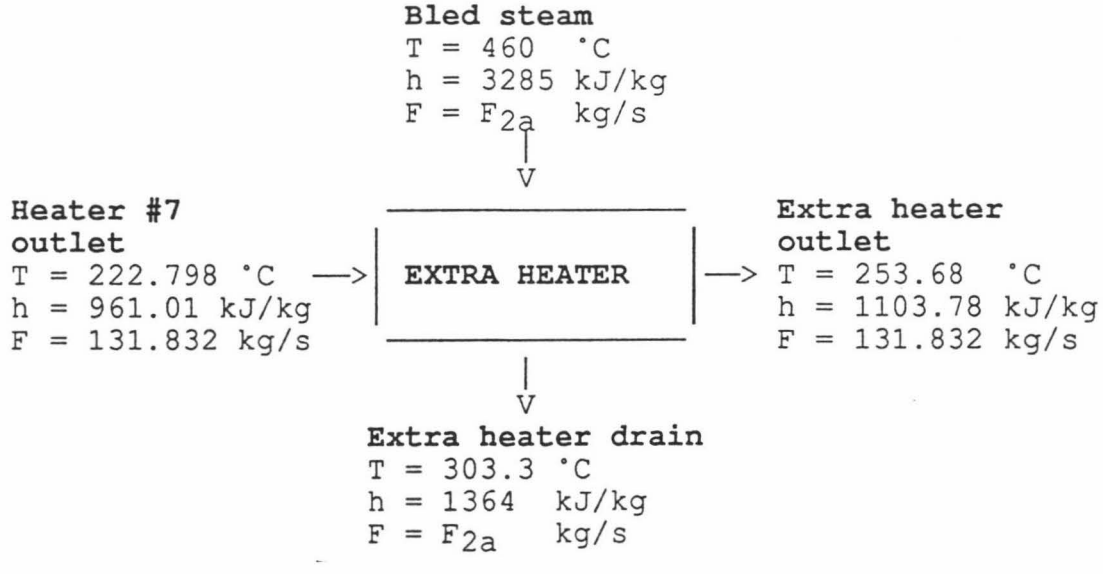
1. the drain of the extra heater is a saturated liquid.
   Therefore, the drain properties are :

   T = 303.3 °C
   h = 1364 kJ/kg
   F = F_{2a} kg/s

2. the outlet temperature of the extra heater is the same as the economiser outlet temperature.
   Therefore, the outlet properties are:

   T = 253.683 °C
   h = 1103.78 kJ/kg
   F = 131.832 kg/s

Therefore



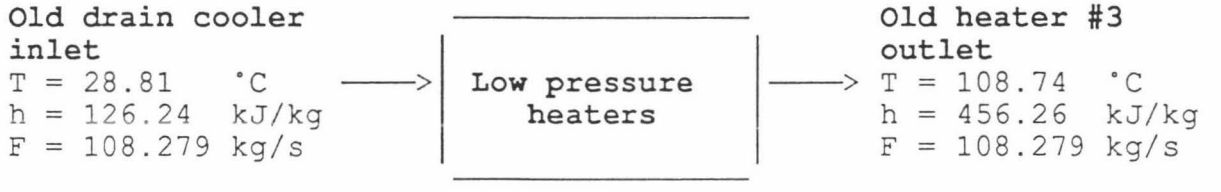
Using enthalpy balance, we have

$$131.832 * (1103.78 - 961.01) = F * (3285 - 1364)$$

$$F = 9.8 \text{ kg/s}$$

1.3.4 CALCULATION OF THE NEW MAIN STREAM PROPERTIES AFTER IT HAS BEEN PASSED THROUGH LOW PRESSURE HEATERS

The heat content of the hot streams of low pressure heaters before the modification is



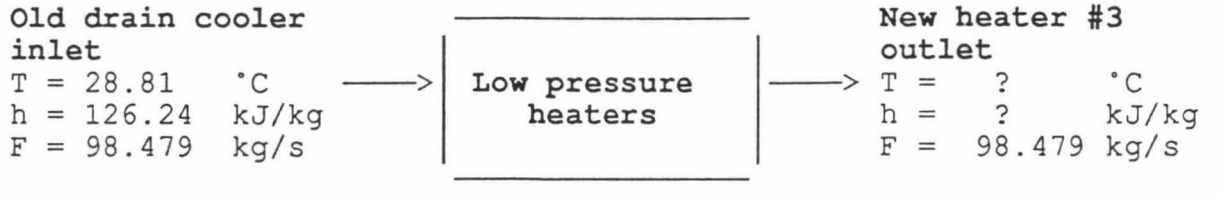
so

$$\delta h = 108.279 * (456.26 - 126.24)$$
$$= 35.73 \text{ MW}$$

Assume that :

1. the heat content from the hot stream remain the same after modification.
2. the drain cooler inlet temperature is the same before and after the modification.

Now we still have 35.73 MW of heat from hot streams, but the cold stream flow is reduce by 9.8 kg/s. The new cold stream properties will be :



Using enthalpy balance,

$$35.73 * 10^3 = (h - 126.24) * 98.479$$

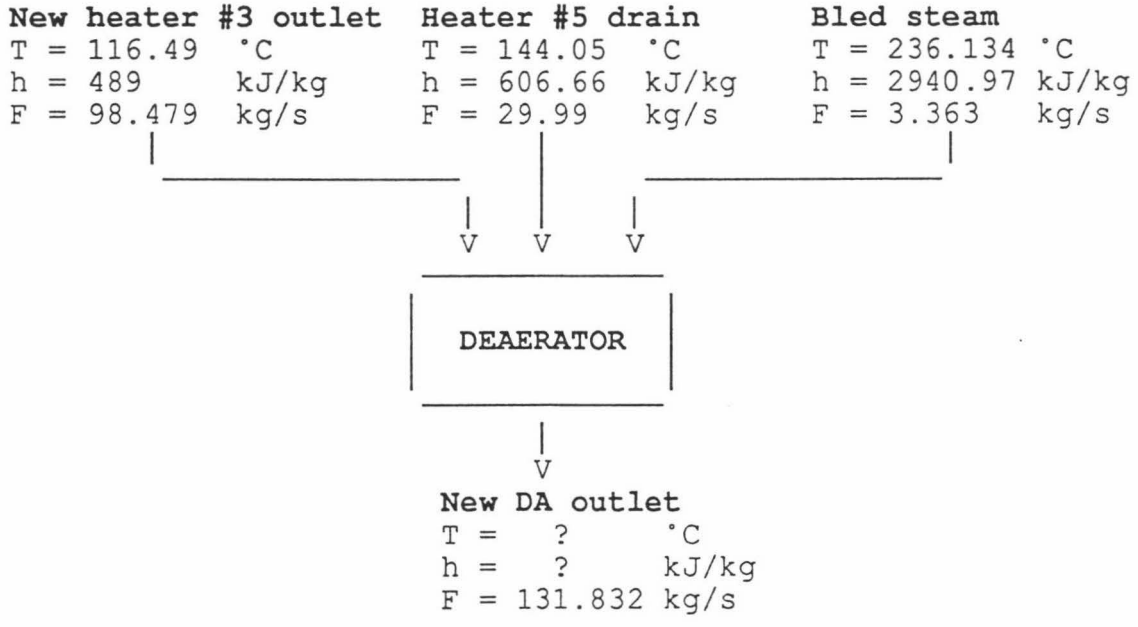
$$h = 489 \text{ kJ/kg}$$

$$T = 116.49 \text{ °C} \quad \text{(from steam table)}$$

1.3.5 CALCULATION OF THE NEW MAIN STREAM PROPERTIES AFTER IT HAS BEEN PASSED THROUGH DEAERATOR

Assume that :

1. The bled steam to DA is the same as before.
2. The heater #5 drain to DA is the same as before except that now the flow is increased by 9.8 kg/s



Enthalpy balance,

$$(489 * 98.479) + (606.66 * 29.99) + (2940.97 * 3.363) = 131.832 * h$$

Therefore

$$h = 578.31 \text{ kJ/kg}$$

$$T = 137.5 \text{ °C} \quad \text{(from steam table)}$$

1.3.6 CALCULATION OF THE NEW MAIN STREAM PROPERTIES AFTER IT HAS BEEN PASSED THROUGH THE PUMP

Assume that the increase in enthaply in the pump is the same before and after the modification.

Increased in enthalpy before the modification

Old DA outlet ——>| **PUMP** |——> **Old Heater #5 inlet**
T = 129.15 °C T = 132.614 °C
h = 542.68 kJ/kg h = 569.66 kJ/kg

Therefore $\delta h = 569.66 - 542.68 = 26.98$ kJ/kg

Now

New DA outlet ——>| **PUMP** |——> **New Heater #5 inlet**
T = 137.5 °C T = ? °C
h = 542.68 kJ/kg h = ? kJ/kg

Therefore

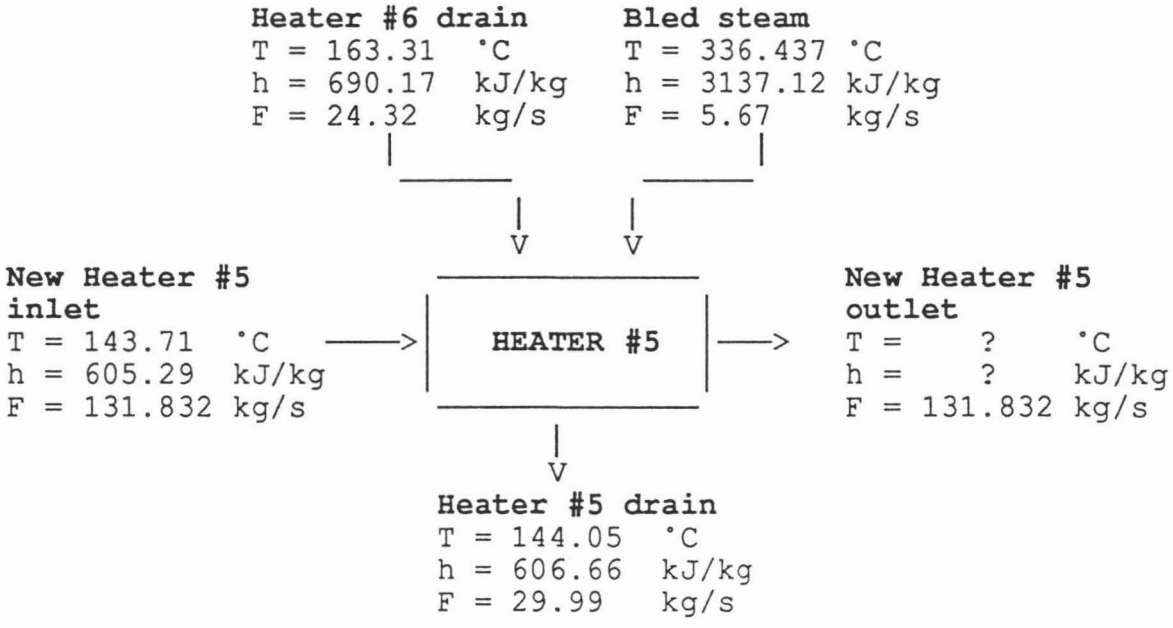
$h = 542.68 + 26.98 = 605.29$ kJ/kg

T = 143.71 °C (from steam table)

1.3.7 CALCULATION OF THE NEW MAIN STREAM PROPERTIES AFTER IT HAS BEEN PASSED THROUGH THE HEATER #5

Assume that :

1. The bled steam to heater #5 is the same as before.
2. The heater #6 drain to Heater #5 and the heater #5 drain are the same as before except that now the flow is increased by 9.8 kg/s.



Enthalpy balance,

$$5.67 * (3137.12 - 606.66) + 24.32 * (690.17 - 606.66) = 131.832 * (h - 605.29)$$

Therefore

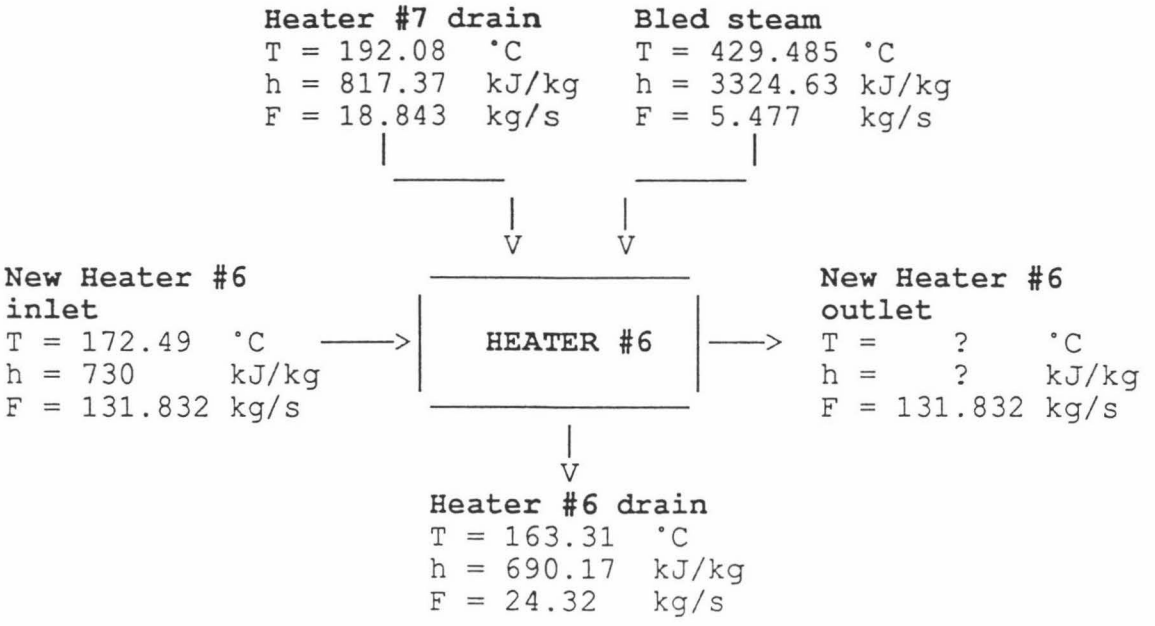
$$h = 730 \text{ kJ/kg}$$

$$T = 172.49 \text{ °C (from steam table)}$$

1.3.8 CALCULATION OF THE NEW MAIN STREAM PROPERTIES AFTER IT HAS BEEN PASSED THROUGH THE HEATER #6

Assume that :

1. The bled steam to heater #6 is the same as before.
2. The heater #7 drain to Heater #6 and the heater #6 drain are the same as before except that now the flow is increased by 9.8 kg/s.



Enthalpy balance,

$$5.447 * (3324.63 - 690.17) + 18.843 * (813.37 - 690.17) = 131.832 * (h - 730)$$

Therefore

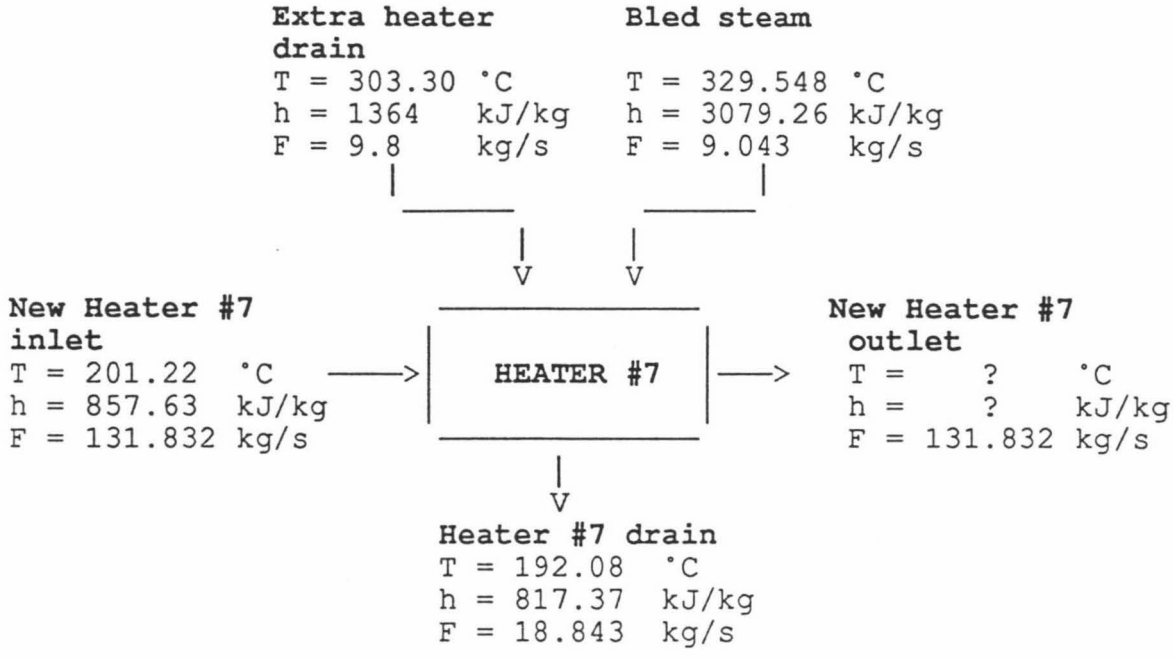
h = 857.63 kJ/kg

T = 201.22 °C (from steam table)

1.3.9 CALCULATION OF THE NEW MAIN STREAM PROPERTIES AFTER IT HAS BEEN PASSED THROUGH THE HEATER #7

Assume that :

1. The bled steam to heater #7 is the same as before.
2. The extra heater drain to heater #7 is the same as before.
3. The heater #7 drain is the same as before except that now the flow is increased by 9.8 kg/s.



Enthalpy balance,

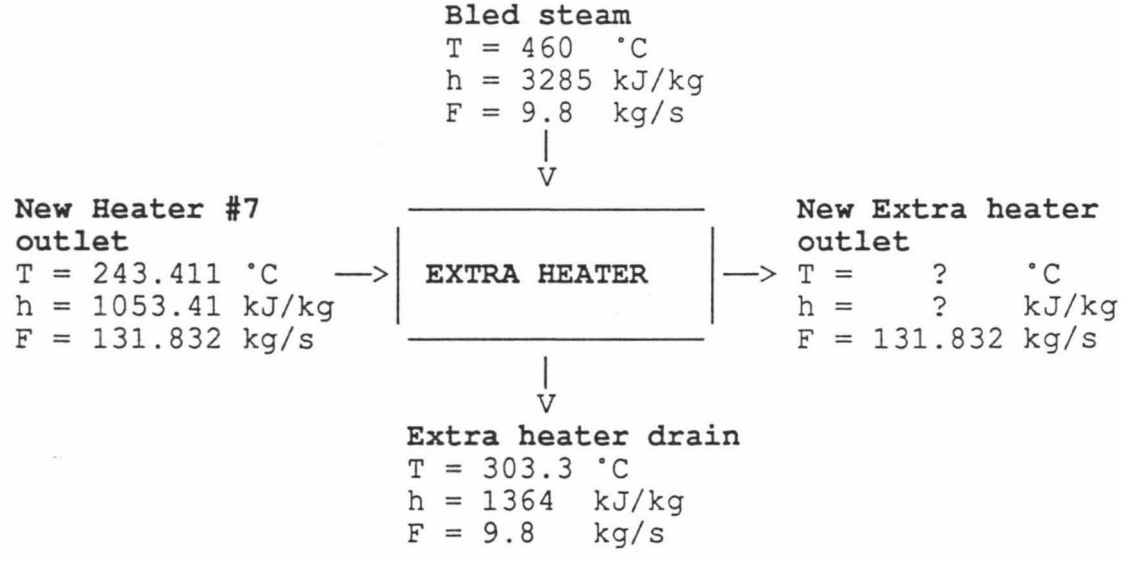
$$9.8 * (1364 - 817.37) + 9.043 * (3079.26 - 817.37) = 131.832 * (h - 857.63)$$

Therefore

$h = 1053.41$ kJ/kg

$T = 243.41$ °C (from steam table)

1.3.10 CALCULATION OF THE NEW MAIN STREAM PROPERTIES AFTER IT HAS BEEN PASSED THROUGH THE EXTRA HEATER



Enthalpy balance,

$9.8 * (3285 - 1364) = 131.832 * (h - 1053.41)$

Therefore

$h = 1196.21$ kJ/kg

$T = 272.1$ °C (from steam table)

1.3.11 CALCULATION OF THE EFFICIENCY AFTER THE MODIFICATION

Refer to Figure 35.

We have

F_1	= 131.832 kg/s	h_1	= 961.01 kJ/kg	h_9	= 2707.24 kJ/kg
F_{2a}	= 9.800 kg/s	h_{2a}	= 3285.00 kJ/kg	h_{10}	= 2645.38 kJ/kg
F_2	= 9.043 kg/s	h_2	= 3403.00 kJ/kg	h_{11}	= 2431.73 kJ/kg
F_3	= 5.477 kg/s	h_3	= 3079.26 kJ/kg	h_{12}	= 109.72 kJ/kg
F_4	= 5.670 kg/s	h_4	= 3521.72 kJ/kg		
F_5	= 3.363 kg/s	h_5	= 3324.63 kJ/kg		
F_6	= 5.604 kg/s	h_6	= 3137.12 kJ/kg		
F_7	= 7.056 kg/s	h_7	= 2940.97 kJ/kg		
F_8	= 0.059 kg/s	h_8	= 2821.71 kJ/kg		

and

F_{1a}	$= F_1 - F_{2a}$	= 122.032	kg/s
F_a	$= F_1 - F_{2a} - F_2$	= 112.989	kg/s
F_b	$= F_1 - F_{2a} - F_2 - F_3$	= 107.512	kg/s
F_c	$= F_1 - F_{2a} - F_2 - F_3 - F_4$	= 101.842	kg/s
F_d	$= F_1 - F_{2a} - F_2 - F_3 - F_4 - F_5$	= 98.479	kg/s
F_e	$= F_1 - F_{2a} - F_2 - F_3 - F_4 - F_5 - F_6$	= 92.875	kg/s
F_f	$= F_1 - F_{2a} - F_2 - F_3 - F_4 - F_5 - F_6 - F_7$	= 85.819	kg/s
F_g	$= F_1 - F_{2a} - F_2 - F_3 - F_4 - F_5 - F_6 - F_7 - F_8$	= 85.760	kg/s

Now

The new heat added to the cycle is

New $Q_{in} = F_1*(h_2-h_1) + F_a*(h_4-h_3)$

thus New $Q_{in} = 340.92$ MW

and new the work of the turbines is

$$\text{New } W_{out} = F_1*(h_2-h_{2a}) + F_{1a}*(h_{2a}-h_3) + F_a*(h_4-h_5) + F_b*(h_5-h_6) + F_c*(h_6-h_7) + F_d*(h_7-h_8) + F_e*(h_8-h_9) + F_f*(h_9-h_{10}) + F_g*(h_{10}-h_{11})$$

which assumes that the pump work has been negleted.

thus New W_{out} = 149.07 MW

The new steam cycle efficiency is

$$\text{New } \eta = \frac{\text{New } W_{out}}{\text{New } Q_{in}} \times 100\%$$

thus New η = 43.72%

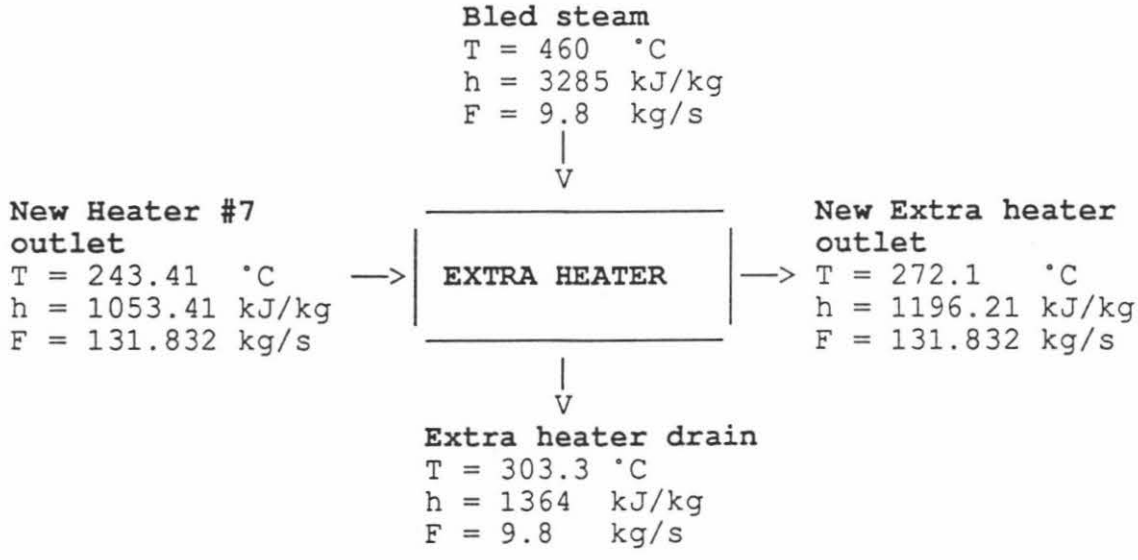
The increased in efficiency is

43.72% - 43.37% = **0.35%**

The reduction in overall power output is

163.1 - 149.07 = **14.03 MW** (i.e. 9.3%)

1.3.12 CALCULATION OF THE AREA REQUIREMENT



The heat flow across the heater is

$$\phi = UA\ \delta T_{LM}$$

We have

$$\phi = (3285 - 1364) * 9.8$$

$$= 18.82\ MW$$

and

$$\delta T_{LM} = \frac{(460 - 272.1) - (303.3 - 243.41)}{\ln [(460 - 272.1) / (303.3 - 243.41)]}$$

$$= 111.95\ ^{\circ}C$$

Thus $$UA = \frac{18.82 \times 10^{6}}{111.95}$$

$$= 168.11\ kW/^{\circ}C$$

APPENDIX A8

THE INPUT AND CALCULATED DATA FOR PLOTTING GRAND COMPOSITE CURVES

The followings are the input and the calculated data for plotting the grand composite curves of the plant producing 150 MW, 200 MW and 250 MW power outputs.

1.0 150 MW POWER OUTPUT

1.1 INPUT DATA

Setting up the interval temperatures

δT_{min} = 1 (°C)

'1' Hot or '0' Cold	STREAMS	ACTUAL TEMPERATURES SOURCE (°C)	ACTUAL TEMPERATURES TARGET (°C)	INTERVAL TEMPERATURES SOURCE (°C)	INTERVAL TEMPERATURES TARGET (°C)	RANKED ORDER (°C)	CP (MW/°C)
1	2	3	4	5	6	7	8
1	Heater #7	329.548	225.43	329.048	224.93	1914.859	-0.02417
1	Heater #7	225.43	225.33	224.93	224.83	1115.784	-165.671
1	Heater #7	225.33	192.08	224.83	191.58	922.407	-0.04119
1	Heater #6	192.08	187	191.58	186.5	691.463	-0.04195
1	Heater #6	429.485	187	428.985	186.5	540.5	-0.01225
1	Heater #6	187	186.9	186.5	186.4	527.5	-108.905
1	Heater #6	186.9	163.31	186.4	162.81	430.5	-0.06369
1	Heater #5	163.31	161.55	162.81	161.05	428.985	-0.06567
1	Heater #5	336.437	161.55	335.937	161.05	383.447	-0.01225
1	Heater #5	161.55	161.45	161.05	160.95	353.174	-117.759
1	Heater #5	161.45	144.05	160.95	143.55	335.937	-0.08766
1	Deaerator	144.05	129.15	143.55	128.65	329.048	-0.08669
1	Deaerator	236.134	129.15	235.634	128.65	327.85	-0.00696

1	Deaerator	129.15	129.05	128.65	128.55	289.912	-73.1946
1	Heater #3	173.89	107.669	173.39	107.169	271.197	-0.01131
1	Heater #3	107.669	107.569	107.169	107.069	254.18	-125.336
1	Heater #2	107.569	78.634	107.069	78.134	244.074	-0.02368
1	Heater #2	112.334	78.634	111.834	78.134	235.634	-0.01370
1	Heater #2	78.634	78.534	78.134	78.034	224.93	-163.178
1	Heater #1	78.534	68.661	78.034	68.161	224.83	-0.05362
1	Heater #1	271.697	68.661	271.197	68.161	223.943	-0.00185
1	Heater #1	68.661	68.561	68.161	68.061	223.298	-22.3478
1	Drain Cooler	68.561	36.223	68.061	35.723	223.24	-0.05712
1	Furnace Wall	1915.359	1116.284	1914.859	1115.78	191.58	-0.24467
1	Furnace Wall	1915.359	383.947	1914.859	383.447	188.25	-0.00805
1	SSH	1116.284	922.907	1115.784	922.407	186.5	-0.23651
1	Reheater	922.907	691.963	922.407	691.463	186.4	-0.22937
1	PSH	691.963	383.947	691.463	383.447	173.39	-0.21632
1	Economiser	383.947	290.412	383.447	289.912	162.81	-0.20655
1	Secondary Air	290.412	101.936	289.912	101.436	161.05	-0.10474
1	Secondary Air	290.412	105.988	289.912	105.488	160.95	-0.10488
1	Condenser	26.1	26	25.6	25.5	160.89	-2015.31
1	Condenser	36.223	26.1	35.723	25.6	143.55	-0.06017
1	Condenser	99.068	26.1	98.568	25.6	133.114	-0.00091
1	Condenser	54.517	26.1	54.017	25.6	129.65	-0.00043
1	Condenser	78.949	26.1	78.449	25.6	128.65	-0.00042
1	Condenser	99.632	26.1	99.132	25.6	128.55	-0.00039
1	Condenser	30.753	26.1	30.253	25.6	111.834	-0.02000
1	BFPT Condenser	20.23	20.13	19.73	19.63	109.24	-113.058
1	BFPT Condenser	58.272	20.23	57.772	19.73	107.169	-0.00010
1	BFPT Condense	99.632	20.23	99.132	19.73	107.069	-0.00010
0	Drain Cooler	28.81	33.95	29.31	34.45	106.488	0.359174
0	Heater #1	33.95	40.95	34.45	41.45	105.488	0.448739
0	Heater #2	40.95	79.55	41.45	80.05	102.436	0.452443
0	Heater #3	79.55	108.74	80.05	109.24	101.436	0.455038
0	Deaerator	108.74	129.15	109.24	129.65	99.132	0.558202
0	Heater #5	132.614	160.39	133.114	160.89	98.568	0.560153
0	Heater #6	160.39	187.75	160.89	188.25	80.05	0.569441
0	Heater #7	187.75	222.74	188.25	223.24	78.449	0.584559
0	Economiser	222.798	253.68	223.298	254.18	78.134	0.609470
0	Furnace Wall	253.68	352.674	254.18	353.174	78.034	1.924011
0	PSH	352.674	430	353.174	430.5	68.161	0.861717
0	SSH	430	540	430.5	540.5	68.061	0.415682
0	Reheater	327.35	527	327.85	527.5	57.772	0.265332
0	Secondary Air	25.149	243.574	25.649	244.074	54.017	0.083831
0	Secondary Air	25.149	223.443	25.649	223.943	41.45	0.090227

0	Secondary Air	25.149	101.936	25.649	102.436	35.723	0.018628
0	Secondary Air	25.149	105.988	25.649	106.488	34.45	0.018516
						30.253	
						29.31	
						25.649	
						25.6	
						25.5	
						19.73	
						19.63	

1.2 CALCULATED DATA

The interval temperatures in column 1 and the corrected heat cascade in column 6 are used to plot the grand composite curves.

Constructing the heat cascade

INTERVAL TEMPERATURE (°C)	δT (°C)	$\Sigma CP_c - \Sigma CP_h$ (MW)	δH (MW)	HEAT CASCADE (MW)	CORRECTED HEAT CASCADE (MW)
1	2	3	4	5	6
1914.859				0.00	0.00
1115.784	799.075	-0.252730	-201.95	201.95	201.95
922.407	193.377	-0.244573	-47.29	249.25	249.25
691.463	230.944	-0.237430	-54.83	304.08	304.08
540.5	150.963	-0.224380	-33.87	337.95	337.95
527.5	13	0.1913024	2.49	335.47	335.47
430.5	97	0.4566350	44.29	291.17	291.17
428.985	1.515	0.9026696	1.37	289.80	289.80
383.447	45.538	0.8904182	40.55	249.26	249.26
353.174	30.273	0.9082407	27.50	221.76	221.76
335.937	17.237	1.9705348	33.97	187.79	187.79
329.048	6.889	1.9582791	13.49	174.30	174.30
327.85	1.198	1.9340999	2.32	171.99	171.99
289.912	37.938	1.6687673	63.31	108.68	108.68
271.197	18.715	1.6657031	31.17	77.50	77.50
254.18	17.017	1.6638445	28.31	49.19	49.19
244.074	10.106	0.3493030	3.53	45.66	45.66

235.634	8.44	0.4331344	3.66	42.00	42.00
224.93	10.704	0.4261725	4.56	37.44	37.44
224.83	0.1	-165.2210	-16.52	53.96	53.96
223.943	0.887	0.4091591	0.36	53.60	53.60
223.298	0.645	0.4993865	0.32	53.28	53.28
223.24	0.058	-0.110083	-0.01	53.29	53.29
191.58	31.66	0.4744759	15.02	38.26	38.26
188.25	3.33	0.4737111	1.58	36.69	36.69
186.5	1.75	0.4585927	0.80	35.88	35.88
186.4	0.1	-108.3929	-10.84	46.72	46.72
173.39	13.01	0.4491018	5.84	40.88	40.88
162.81	10.58	0.4377865	4.63	36.25	36.25
161.05	1.76	0.4358161	0.77	35.48	35.48
160.95	0.1	-117.2459	-11.72	47.21	47.21
160.89	0.06	0.4260778	0.03	47.18	47.18
143.55	17.34	0.4167900	7.23	39.95	39.95
133.114	10.436	0.4177590	4.36	35.59	35.59
129.65	3.464	-0.142394	-0.49	36.09	36.09
128.65	1	0.4158088	0.42	35.67	35.67
128.55	0.1	-72.68522	-7.27	42.94	42.94
111.834	16.716	0.5094656	8.52	34.42	34.42
109.24	2.594	0.4957640	1.29	33.14	33.14
107.169	2.071	0.3926000	0.81	32.32	32.32
107.069	0.1	-124.9323	-12.49	44.82	44.82
106.488	0.581	0.3802346	0.22	44.60	44.60
105.488	1	0.3987506	0.40	44.20	44.20
102.436	3.052	0.5036308	1.54	42.66	42.66
101.436	1	0.5222589	0.52	42.14	42.14
99.132	2.304	0.6270009	1.44	40.69	40.69
98.568	0.564	0.6265029	0.35	40.34	40.34
80.05	18.518	0.6255904	11.58	28.76	28.76
78.449	1.601	0.6229951	1.00	27.76	27.76
78.134	0.315	0.6225748	0.20	27.56	27.56
78.034	0.1	-162.5185	-16.25	43.81	43.81
68.161	9.873	0.6063319	5.99	37.83	37.83
68.061	0.1	-21.68602	-2.17	40.00	40.00
57.772	10.289	0.6046957	6.22	33.78	33.78
54.017	3.755	0.6045916	2.27	31.50	31.50
41.45	12.567	0.6041598	7.59	23.91	23.91
35.723	5.727	0.6004554	3.44	20.47	20.47
34.45	1.273	0.5973967	0.76	19.71	19.71
30.253	4.197	0.5078321	2.13	17.58	17.58
29.31	0.943	0.4878308	0.46	17.12	17.12
25.649	3.661	0.1286563	0.47	16.65	16.65

25.6	0.047	-0.082546	16.65	0.00	0.00
25.5	0.102	-2015.317	-205.56	205.56	205.56
19.73	5.77	-0.000208	-0.00	205.56	205.56
19.63	0.1	-113.0588	-11.31	216.87	216.87

2.0 200 MW POWER OUTPUT

2.1 INPUT DATA

Setting up the interval temperatures

δT_{min} = 9 (°C)

'1' Hot or '0' Cold	STREAMS	ACTUAL TEMPERATURES SOURCE (°C)	ACTUAL TEMPERATURES TARGET (°C)	INTERVAL TEMPERATURES SOURCE (°C)	INTERVAL TEMPERATURES TARGET (°C)	RANKED ORDER (°C)	CP (MW/°C)
1	2	3	4	5	6	7	8
1	Heater #7	340.795	240	336.295	235.5	1918.313	-0.03230
1	Heater #7	240	239.9	235.5	235.4	1235.543	-233.976
1	Heater #7	239.9	204.93	235.4	200.43	1026.008	-0.06171
1	Heater #6	204.93	199.1	200.43	194.6	759.322	-0.06186
1	Heater #6	439.781	199.1	435.281	194.6	553.09	-0.01721
1	Heater #6	199.1	199	194.6	194.5	550.227	-145.934
1	Heater #6	199	174.74	194.5	170.24	443.5	-0.09235
1	Heater #5	174.74	172	170.24	167.5	435.281	-0.09379
1	Heater #5	346.591	172	342.091	167.5	388.569	-0.01748
1	Heater #5	172	171.9	167.5	167.4	359.257	-161.928
1	Heater #5	171.9	154.08	167.4	149.58	344.88	-0.12552
1	Deaerator	154.08	138.25	149.58	133.75	342.091	-0.12399
1	Deaerator	244.168	138.25	239.668	133.75	336.295	-0.00870
1	Deaerator	138.25	138.15	133.75	133.65	303.953	-88.9885
1	Heater #3	184.303	117.393	179.803	112.893	269.023	-0.01253
1	Heater #3	117.393	117.293	112.893	112.793	265.249	-135.560
1	Heater #2	117.293	93.26	112.793	88.76	246.029	-0.02609
1	Heater #2	126.787	93.26	122.287	88.76	241.911	-0.01194
1	Heater #2	93.26	93.16	88.76	88.66	241.87	-136.972
1	Heater #1	93.16	72.55	88.66	68.05	239.668	-0.05130
1	Heater #1	107.202	72.55	102.702	68.05	235.5	-0.01445
1	Heater #1	72.55	72.45	68.05	67.95	235.4	-172.438

1	Drain Cooler	72.45	39.964	67.95	35.464	204.05	-0.08210
1	Furnace Wall	1922.813	1240.043	1918.313	1235.54	200.43	-0.29838
1	Furnace Wall	1922.813	393.069	1918.313	388.569	194.6	-0.02172
1	SSH	1240.043	1030.508	1235.543	1026.00	194.5	-0.28082
1	Reheater	1030.508	763.822	1026.008	759.322	179.803	-0.27138
1	PSH	763.822	393.069	759.322	388.569	175.65	-0.25608
1	Economiser	393.069	308.453	388.569	303.953	170.24	-0.26866
1	Secondary Air	308.453	106.001	303.953	101.501	167.5	-0.13338
1	Secondary Air	308.453	111.061	303.953	106.561	167.4	-0.13353
1	Condenser	29.198	29.098	24.698	24.598	149.58	-2575.12
1	Condenser	39.964	29.198	35.464	24.698	146.147	-0.08034
1	Condenser	99.068	29.198	94.568	24.698	142.75	-0.00091
1	Condenser	55.406	29.198	50.906	24.698	133.75	-0.00035
1	Condenser	77.309	29.198	72.809	24.698	133.65	-0.00036
1	Condenser	99.632	29.198	95.132	24.698	122.92	-0.00032
1	Condenser	30.066	29.198	25.566	24.698	122.287	-0.02094
1	BFPT Condenser	20.635	20.625	16.135	16.125	115.561	-1418.09
1	BFPT Condenser	59.038	20.635	54.538	16.135	112.893	-0.00010
1	BFPT Condenser	99.632	20.635	95.132	16.135	112.793	-0.00010
0	Drain Cooler	31.99	36.61	36.49	41.11	110.501	0.577219
0	Heater #1	36.61	68.84	41.11	73.34	106.561	0.583396
0	Heater #2	68.84	93.99	73.34	98.49	102.702	0.585520
0	Heater #3	93.99	118.42	98.49	122.92	101.501	0.589275
0	Deaerator	118.42	138.25	122.92	142.75	98.49	0.594309
0	Heater #5	141.647	171.15	146.147	175.65	95.132	0.736903
0	Heater #6	171.15	199.55	175.65	204.05	94.568	0.751300
0	Heater #7	199.55	237.37	204.05	241.87	88.76	0.775854
0	Economiser	237.411	264.523	241.911	269.023	88.66	0.814110
0	Furnace Wall	264.523	354.757	269.023	359.257	73.34	2.616278
0	PSH	354.757	439	359.257	443.5	72.809	1.127033
0	SSH	439	548.59	443.5	553.09	68.05	0.536556
0	Reheater	340.38	545.727	344.88	550.227	67.95	0.352437
0	Secondary Air	20.1	260.749	24.6	265.249	54.538	0.108043
0	Secondary Air	20.1	241.529	24.6	246.029	50.906	0.114432
0	Secondary Air	20.1	106.001	24.6	110.501	41.11	0.011681
0	Secondary Air	20.1	111.061	24.6	115.561	36.49	0.011218
						35.464	
						25.566	
						24.698	
						24.6	
						24.598	
						16.135	
						16.125	

2.2 CALCULATED DATA

The interval temperatures in column 1 and the corrected heat cascade in column 6 are used to plot the grand composite curves.

Constructing the heat caccade

INTERVAL TEMPERATURE (°C)	δT (°C)	$\Sigma CP_c - \Sigma CP_h$ (MW)	δH (MW)	HEAT CASCADE (MW)	CORRECTED HEAT CASCADE (MW)
1	2	3	4	5	6
1918.313				0.00	0.00
1235.543	682.77	-0.320117	-218.57	218.57	218.57
1026.008	209.535	-0.302559	-63.40	281.96	281.96
759.322	266.686	-0.293111	-78.17	360.13	360.13
553.09	206.232	-0.277817	-57.29	417.43	417.43
550.227	2.863	0.2587388	0.74	416.69	416.69
443.5	106.727	0.6111765	65.23	351.46	351.46
435.281	8.219	1.2016539	9.88	341.58	341.58
388.569	46.712	1.1844410	55.33	286.25	286.25
359.257	29.312	1.1935926	34.99	251.27	251.27
344.88	14.377	2.6828376	38.57	212.70	212.70
342.091	2.789	2.3303999	6.50	206.20	206.20
336.295	5.796	2.3129099	13.41	192.79	192.79
303.953	32.342	2.2806049	73.76	119.03	119.03
269.023	34.93	2.2823509	79.72	39.31	39.31
265.249	3.774	0.4801826	1.81	37.50	37.50
246.029	19.22	0.5882265	11.31	26.19	26.19
241.911	4.118	0.7026585	2.89	23.30	23.30
241.87	0.041	-0.111451	-0.00	23.30	23.30
239.668	2.202	0.6644031	1.46	21.84	21.84
235.5	4.168	0.6556936	2.73	19.11	19.11
235.4	0.1	-233.2889	-23.33	42.43	42.43
204.05	31.35	0.6262832	19.63	22.80	22.80
200.43	3.62	0.6017292	2.18	20.62	20.62
194.6	5.83	0.6015838	3.51	17.11	17.11

194.5	0.1	-145.2533	-14.53	31.64	31.64
179.803	14.697	0.5883000	8.65	22.99	22.99
175.65	4.153	0.5757607	2.39	20.60	20.60
170.24	5.41	0.5613633	3.04	17.57	17.57
167.5	2.74	0.5599209	1.53	16.03	16.03
167.4	0.1	-161.2568	-16.13	32.16	32.16
149.58	17.82	0.5456817	9.72	22.43	22.43
146.147	3.433	0.5472204	1.88	20.55	20.55
142.75	3.397	-0.189682	-0.64	21.20	21.20
133.75	9	0.4046264	3.64	17.56	17.56
133.65	0.1	-88.45117	-8.85	26.40	26.40
122.92	10.73	0.5373262	5.77	20.64	20.64
122.287	0.633	0.5322925	0.34	20.30	20.30
115.561	6.726	0.5203482	3.50	16.80	16.80
112.893	2.668	0.5315667	1.42	15.38	15.38
112.793	0.1	-135.0160	-13.50	28.88	28.88
110.501	2.292	0.5180136	1.19	27.70	27.70
106.561	3.94	0.5296950	2.09	25.61	25.61
102.702	3.859	0.6632325	2.56	23.05	23.05
101.501	1.201	0.6487726	0.78	22.27	22.27
98.49	3.011	0.7821546	2.36	19.92	19.92
95.132	3.358	0.7784000	2.61	17.30	17.30
94.568	0.564	0.7779681	0.44	16.86	16.86
88.76	5.808	0.7770570	4.51	12.35	12.35
88.66	0.1	-136.1578	-13.62	25.97	25.97
73.34	15.32	0.7637844	11.70	14.26	14.26
72.809	0.531	0.7616595	0.40	13.86	13.86
68.05	4.759	0.7612991	3.62	10.24	10.24
67.95	0.1	-171.6110	-17.16	27.40	27.40
54.538	13.412	0.7449623	9.99	17.41	17.41
50.906	3.632	0.7448571	2.71	14.70	14.70
41.11	9.796	0.7445007	7.29	7.41	7.41
36.49	4.62	0.7383242	3.41	4.00	4.00
35.464	1.026	0.1611046	0.17	3.83	3.83
25.566	9.898	0.1628639	1.61	2.22	2.22
24.698	0.868	0.1419167	2.22	-0.00	-0.00
24.6	0.098	-2574.882	-252.34	252.34	252.34
24.598	0.002	-2575.127	-5.15	257.49	257.49
16.135	8.463	-0.000210	-0.00	257.49	257.49
16.125	0.01	-1418.095	-14.18	271.67	271.67

3.0 250 MW POWER OUTPUT

3.1 INPUT DATA

The input data is given in the section 5 of the main report (i.e. Table 5).

3.2 CALCULATED DATA

The interval temperatures in column 1 and the corrected heat cascade in column 6 are used to plot the grand composite curves.

Constructing the heat cascade

INTERVAL TEMPERATURE (°C) 1	δT (°C) 2	$\Sigma CP_c - \Sigma CP_h$ (MW) 3	δH (MW) 4	HEAT CASCADE (MW) 5	CORRECTED HEAT CASCADE (MW) 6
1889.64				0.00	0.00
1310.27	579.37	-0.3898	-225.84	225.84	225.84
1120.254	190.016	-0.37285	-70.85	296.69	296.69
845.699	274.555	-0.36251	-99.53	396.21	396.22
545.79	299.909	-0.34448	-103.31	499.53	499.53
543.42	2.37	0.306797	0.73	498.80	498.80
450.4	93.02	0.737727	68.62	430.18	430.18
444.6	5.8	1.439539	8.35	421.83	421.83
436.35	8.25	1.453739	11.99	409.83	409.84
361.897	74.453	1.433759	106.75	303.09	303.09
348.4	13.497	3.574	48.24	254.85	254.85
343.021	5.379	3.621696	19.48	235.37	235.37
341.71	1.311	3.600326	4.72	230.65	230.65
332.6	9.11	3.169396	28.87	201.77	201.77
329.67	2.93	3.170196	9.29	192.49	192.49
307.4	22.27	3.114646	69.36	123.12	123.12
286.4	21	3.213143	67.48	55.65	55.65
272.578	13.822	0.717178	9.91	45.73	45.73
255.44	17.138	0.829036	14.21	31.53	31.53
244.6	10.84	0.768401	8.33	23.20	23.20

244.577	0.023	-310.8310	-7.15	30.35	30.35
244.5	0.077	-310.8463	-23.94	54.28	54.28
213.83	30.67	0.723061	22.18	32.10	32.10
208.43	5.4	0.688333	3.72	28.39	28.39
203	5.43	0.688563	3.74	24.65	24.65
202.9	0.1	-161.8061	-16.18	40.83	40.83
187.35	15.55	0.673493	10.47	30.36	30.36
182.34	5.01	0.654612	3.28	27.08	27.08
182.14	0.2	0.640932	0.13	26.95	26.95
177.02	5.12	0.639882	3.28	23.67	23.67
176.92	0.1	-188.8683	-18.89	42.56	42.56
165.4	11.52	0.624292	7.19	35.37	35.37
156.56	8.84	0.634835	5.61	29.75	29.76
154.6	1.96	-0.248286	-0.49	30.24	30.24
153.4	1.2	-0.193696	-0.23	30.47	30.47
151.32	2.08	0.504194	1.05	29.43	29.43
142.7	8.62	0.505584	4.36	25.07	25.07
142.6	0.1	-150.9120	-15.09	40.16	40.16
127.492	15.108	0.677914	10.24	29.92	29.92
125.4	2.092	0.666763	1.39	28.52	28.52
120.14	5.26	0.713123	3.75	24.77	24.77
120.04	0.1	-143.1060	-14.31	39.08	39.08
117.509	2.531	0.698973	1.77	37.31	37.31
114.6	2.909	0.686323	2.00	35.32	35.32
105.31	9.29	0.961213	8.93	26.39	26.39
97.45	7.86	0.956749	7.52	18.87	18.87
97.425	0.025	0.902619	0.02	18.84	18.84
97.325	0.1	-141.1479	-14.11	32.96	32.96
94.232	3.093	0.943099	2.92	30.04	30.04
93.668	0.564	0.942759	0.53	29.51	29.51
83.183	10.485	0.941849	9.88	19.63	19.63
80.702	2.481	0.938967	2.33	17.30	17.31
75.17	5.532	0.917867	5.08	12.23	12.23
75.07	0.1	-224.5629	-22.46	34.68	34.68
75.06	0.01	0.993097	0.01	34.67	34.67
74.254	0.806	0.893147	0.72	33.95	33.95
54.36	19.894	0.892897	17.76	16.19	16.19
50.84	3.52	0.892797	3.14	13.05	13.05
43.94	6.9	0.892537	6.16	6.89	6.89
41.922	2.018	0.887469	1.79	5.10	5.10
39.03	2.892	0.887529	2.57	2.53	2.53
31.768	7.262	0.213204	1.55	0.98	0.98
26.4	5.368	0.183264	0.98	0.00	0.00
26.3	0.1	-3055.722	-305.57	305.57	305.57