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A grammar for a text based music scoring program

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The grammar for a text-based music scoring software package and a short example is presented. The computer program developed using this language (available from the author's website) will form the basis for future research into a variety of different input methods for creating music scores.

1 Introduction

This paper describes an altered version of a grammar for a music-description language developed by Gourlay (1986) and used in music printing. This altered grammar has been used as the basis of a computer program Kay (2005) that processes text based input into musical scores. More complete documentation for the program and a yacc version of the grammar is available in the source code of the project.

There are many music scoring programs, Callen (2005) gives a comprehensive list, and the intention of this work is not simply to add yet another program to this list, but to form a solid basis for future research into differing methods of inputting data into scoring software. A gui version of the program that is based on a more natural input, that of using the pen of a tablet based computer, rather than typing text into an editor, is currently under development.

Many revisions to the original grammar were made after extensive scoring of actual musical works. Authoritative examples of notation were also obtained from Ross (1987), Read (1974), Stone (1980) and Gerou and Lusk (1996)

2 Revised Grammar

The following syntactic conventions are used:

bold	→	literal
[ ]	→	optional
…	→	zero or more repeats
italic	→	token defined elsewhere

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The data file consists of two heading sections, describing the instruments used in the score, and the different views required, followed by the measures of each individual instrument:

---

instrument[**s**] **(** *instrument_defn …***)**
view[**s**] **(** *view_defn …***)**
measures …

Each instrument is described by its input pitch, notehead symbols (if it is a percussion instrument), and its midi parameters for audio output:

---

instrument_defn: *instrument_name* [**input** *pitch*] [**notehead** *notehead_symbol*]
[**midi** *midi_instrument*] [*midi_volume*]

instrument_name: **string**
pitch: **Bf** | **C** | **Ef** | etc
notehead_symbol: **cross** | **plus** | **diamond** | **triangle**
midi_instrument: **Oboe** | **Flute** | **Low Tom** etc. Any standard General Midi instrument
midi_volume: **0 - 100**

Each view is described by its system: the bracketing and bracing of each of its staves, along with several parameters for each staff e.g. initial clef, and output pitch:

---

view_defn: *view_name* **(** *system* **)**

view_name: **string**
system: *bracket …*
bracket: **bracket (** *barline_group …* **)** | *barline_group*
barline_group: **barlinegroup (** *brace …* **)** | *brace*
brace: **brace** [**fullname "text"**] [**abbreviation "text"**] **(** *staff …* **)** | *staff*
staff: **staff** [**ossia**] [**div**] [*instrument_name …*] [**fullname text**] [**abbreviation text**]
[**size int**]
[**lines int**]
[**gap int**]
[*clef*]
[*output*]
[*transpose*]
[**directions**]
[**can_be_hidden**]
clef: **trebleclef | treble8clef | bassclef | altoclef | tenorclef | percussionclef**
output: **output** *pitch*
transpose: **up octave** | **up semitone** | **up int semitone** | **down octave** | **down semitone** |
down int semitone

Each measure has details of the parameters applied to every instrument in the system, e.g. repeat signs and tempo markings, along with the data for individual instruments:

---

measures: [*titles*] *measure_defn*

titles: [**title "text"**] [**subtitle "text"**] [**poet "text"**] [**composer "text"**]
[**arranger "text"**] [**header "text"**][**footer "text"**]

measure_defn: **measure**
(([**int**] [**letter**]) | [**reset_measure_number**])
[**"text"**]
[**segno**] [**DC**] [**DC al Coda**] [**DC al Fine**] [**DC al Segno**]
[**DS**] [**DS al Coda**] [**DS al Fine**] [**Fine**] [**al Coda**] [**Coda**]
[**doublebarline**] [**finalbarline**] [**leftrepeat**] [**rightrepeat**] [**rightrepeat int**]
[**tempo** [**"text"**] [*duration* (*/* **int** | **=** *duration*) [**"text"**]]
[**rhythm** [**(**] (**"swing1"** | **"swing2"**) [**)**]]
[**meter** (**int / int** | **commontime** | **cuttime**)]
(*instrument_entry* …**)**

Each instrument entry has details for that particular instrument, e.g. time signatures that are different from those specified in the measure definition and key signatures:

---

instrument_entry: *instrument_name*
[[**cancelbefore** | **cancelafter**] **key** *keysig*]
[**meter** (**int / int** | **commontime** | **cuttime**)]
[**transpose to** *key*]
[**div**] | [**end div**]
(*instrument_data* **)**
| *instrument_name* **repeat**
| *instrument_name* **copy_of** *instrument_name*
keysig: **int sharp**(**s**) | **int flat**(**s**) | **CM** | **Cm** | **FsM** etc

---

The musical data for each instrument is contained in either the default voice, or in either of two explicit voices:

---

instrument_data: *voice_data* …
| *voice_data* … [**voice 1 (** *voice_data* … **)**] [**voice 2 (** *voice_data* … **)**]
| [**voice 1 (** *voice_data* … **)**] [**voice 2 (** *voice_data* … **)**]

Each voice is a sequence of chords and the parameters applied to them:

---

voice_data: [*clef*]
[**leftrepeat**] [**rightrepeat**] [**rightrepeat int**]
[**stem** ([**up**] [**down**])]
[**appoggiatura**]
[**grace**]
[**tuplet** (([**inner**] **int : int**) | **simile**)]
[**beam** [**beam_over_rest**]]
[**slur** [**broken**] [**up** | **down**] [**int**] [*instrument_name*]]
[**cresc** | **dim**]
[**trill**]
[**octave** | **8va** | **8vb**]
[**pedaldown** | **pedalupdown**]
[**glissando**]
[**tremolo int**]
[**beam**]
[**cue** *instrument_name* [**"text"**] [**no_rests**]]
[**beat_unit int**]

chord_defn

[**beat_unit int**]
[**turn**] [**turnslash**]
[**tie**] [**broken tie**]
[**glissando** [**"text"**] [**to** <**;** *note register*>]
[**end cue**]
[**end beam**]
[**pedalup**]
[**end** (**octave** | **8va** | **8vb**)]
[**end trill**]
[**end** (**cresc** | **dim**)]
[**end slur** [**int**] [**name**]]
[**end beam**]
[**end tuplet**]
[**end grace**]

Each chord is described by the notes themselves, and any embellishments applied to them:

---

chord_defn: < *duration* **;** [(*note register*)…] **;** [*embellishment* …] **;** [*lyric* …] **;** [*chord_name*]] >

duration: [**int /**] (**0** | **1** | **2** | **4** | **8** | **16** | **32** | **64** | **128**) [**.** [**.** [**.**]]] [**null**]
note: [**(**][**a – g A – G**] [**f** | **s** | **n** | **ff** | **ss**] [**)**]
| [**a – g A – G**] [**(**] [**f** | **s** | **n** | **ff** | **ss**] [**)**]
register: **0 - 9**
embellishment: *dynamic*
| *accent*
| *articulation*
| *arpeggio*
| *direction*
| *pause*

	| *ornament*
lyric:	**"text"**(["-"] | ["_"])
chord_name:	**"text"**
dynamic:	(**p …** | **f …** | **mp** | **mf** | **fp** | **pf** | **sf …**[**z**] | **rf**[**z**] | **cresc** | **dim**) [**subito**]
accent:	**accent** [**within**] | (**strongaccent** | **marcato**) [**below**] | **weakbeat** | **strongbeat**
articulation:	(**staccato** | **dot**) | **staccatissimo** | **tenuto** | **brieftenuto** | **legato**
arpeggio:	**arpeggio** | **arpeggioup** | **arpeggiodown** | **non-arpeggio**
direction:	**downbow** | **upbow** | **bariolage** | **sul** (**g** | **d** | **a** | **e** | **c** | **pont**[**.**] | **tasto** | **legno**)
	| **pizz**[**.**] | **arco** | **non vib**[**.**] | [**ord**[**.**] | **col legno** | **con** (**sord** | **senza**)
	| (**with**[**out**] | **straight** | **cup** | **bucket** | **harmon**) **mute**)
	| **gestopft** | **stopped** | **mute out** | **"text"** | *fingering*
fingering:	(**1** | **2** | **3** | **4** | **5** | **-**) …
pause:	**fermata** | [**(**] (**comma** | **pause**) [**)**] | **grandpause**
ornament:	(**tr** | **trill**) [**(**] [**s** | **n** | **f** | **ss** | **ff**] [**)**]
	| **mordent** [**(**] [**s** | **n** | **f** | **ss** | **ff**] [**)**] | **longmordent** [**(**] [**s** | **n** | **f** | **ss** | **ff**] [**)**]
	| **mordentslash** [**(**] [**s** | **n** | **f** | **ss** | **ff**] [**)**] | **longmordentslash** [**(**] [**s** | **n** | **f** | **ss** | **ff**] [**)**]
	| **turn** [**(**] [**s** | **n** | **f** | **ss** | **ff**] [**)**] [/] [**(**] [**s** | **n** | **f** | **ss** | **ff**] [**)**]
	| **turnslash** [**(**] [**s** | **n** | **f** | **ss** | **ff**] [**)**] [/] [**(**] [**s** | **n** | **f** | **ss** | **ff**] [**)**]

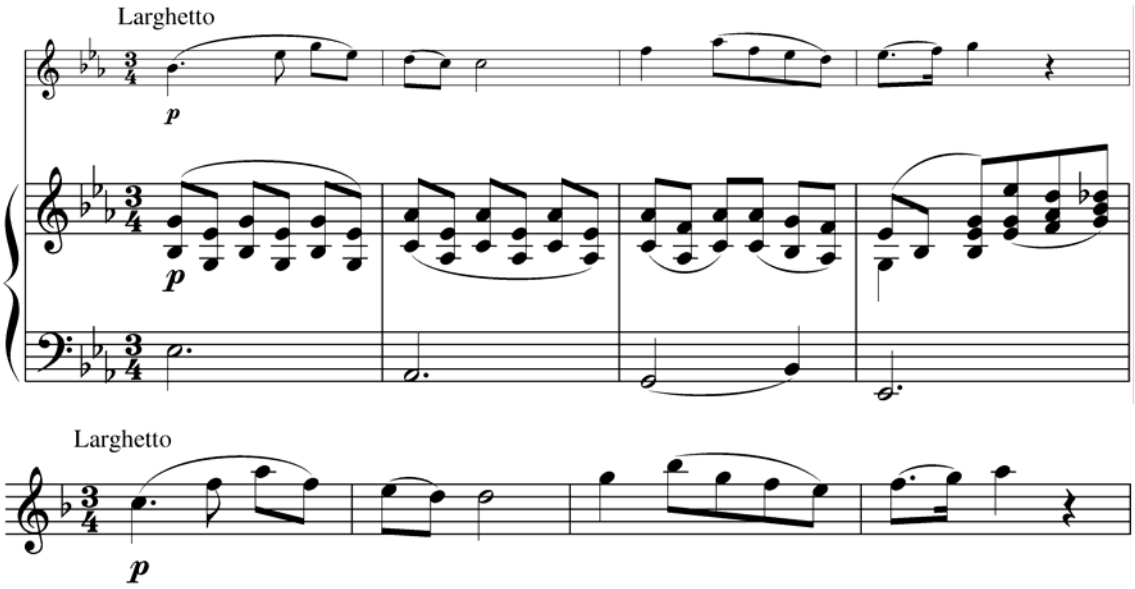
---

3 Example

The following short example shows the text file of a piece for clarinet and piano accompaniment, which will produce two scores, one for the pianist (with the clarinet part included), and one for the clarinetist.

```
instruments (
    clarinet
    piano_righthand
    piano_lefthand
)

views (
    a (
        staff clarinet trebleclef size 14
        brace (
            staff piano_righthand trebleclef
            staff piano_lefthand bassclef
        )
    )
    b (
        staff clarinet output Bf
    )
)

title "Larghetto"
subtitle "from: Quintet for Clarinet and Strings, K. 581"
composer "W.W. Mozart (1756 - 1791)"

measure meter 3/4 tempo "Larghetto" (
    clarinet key 3 flats (slur <4.;b4;p> <8;e5> <8;g5> <8;e5> end slur)
    piano_righthand key 3 flats (slur <8;g4 b3;p> <8;e4 g3>
        <8;g4 b3> <8;e4 g3> <8;g4 b3> <8;e4 g3> end slur)
    piano_lefthand key 3 flats (<2.;e3>)
)

measure (
    clarinet (slur <8;d5> <8;c5> end slur <2;c5>)
    piano_righthand (slur <8;a4 c4> <8;e4 a3> <8;a4 c4> <8;e4 a3>
        <8;a4 c4> <8;e4 a3> end slur )
    piano_lefthand (<2.;a2>)
)
```

```
measure (
    clarinet (<4;f5> slur <8;a5> <8;f5> beat_unit 8 <8;e5> <8;d5> end slur)
    piano_righthand (slur <8;a4 c4> <8;f4 a3> <8;a4 c4> end slur
        slur <8;a4 c4> <8;g4 b3> <8;f4 a3> end slur)
    piano_lefthand (slur <2;g2> <4;b2> end slur)
)

measure (
    clarinet (slur <8.;e5> <16;f5> end slur <4;g5> <4>)
    piano_righthand (
        voice 1 (slur <8;e4> <8;b3> <8;g4 e4 b3> end slur
            slur down <8;e5 g4 e4> beat_unit 8 <8;d5 a4 f4> <8;df5 b4 g4> end slur)
        voice 2 (<4;g3> <2 null> )
    )
    piano_lefthand (<2.;e2>)
)
```



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