A Package for Professional Music Publishing with LilyPond and \LaTeX

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- Requirements for Professional Music Publishing
 Contents of Editions
- 2 LilyPond for Music Typesetting
- Structure of a Score
- OrchestralLily
- 5 Text parts of Editions: Preface & Cove
- 6 Templates
- Availability of OrchestralLily

Typical Contents of a Professional Edition I

• Full score, including:

Music Publishing

•••OO

Contents of Editions

- Nice cover page, inside title page
- Table of contents







• Preface: Introduction, Biography, Lyrics, etc.





Music Publishing

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Contents of Editions

Typical Contents of a Professional Edition II

 The full score itself (including editorial markings), possibly consisting of multiple movements; Some instruments share one staff







Critical report





As in Hammark III are the help to Magazaghi. Hammark is the help to the help t



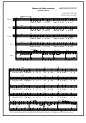
Typical Contents of a Professional Edition III

 Orchestral parts: One part per instrument, containing cue notes to other instruments



The second secon

Piano reduction







Music Publishing OOO●O Contents of Editions

Different Page and Staff Sizes

- Full Score: very large (30x20cm) with small staves (5mm)
- Miniature Score: very small (A5 or smaller) with even smaller staves
- Orchestral Parts: large (A4 or larger) with large staves (7-8 mm)
- Choral Score: A4 with medium staff size
- Vocal Score: Smaller than A4 (27x19cm) with medium staff size

Music Publishing 0000

- Full Score: As much as possible on a single page, position of turns nor very important (except: Organ / piano playing from full score)
- Vocal Score: Turns before/after difficult onsets not advisable
- Orchestral Parts: Turns only during breaks (for strings also at other spots)

Different Content

- Full Score: Editorial markings (brackets, footnotes, etc.)
- Orchestral Parts: Cue notes to other instruments

- Requirements for Professional Music Publishing
- 2 LilyPond for Music Typesetting
 - Introduction to the LilyPond Syntax
 - Full Scores: Same Structure for all Parts / Movements
 - LilyPond is written in C++ and Guile / Scheme; extensible via Scheme
 - Solution: OrchestralLily (simple example)
- Structure of a Score
- OrchestralLily
- 5 Text parts of Editions: Preface & Cove
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A Short Introduction to LilyPond

- Text-based input
- processed by LilyPond binary to PDF
- WYSIWYM (What you see is what you mean): You enter the musical content, not the exact layout
- LilyPond is based on engraving conventions for music developed before computers were used to generate ugly scores.

A very simple LilyPond score

```
\label{eq:condition} $$\operatorname{version} "2.13.17" $$ \end{tabular}
    c4\p d8[( c]) e4-. d-. |
c1 \bar"|."
```



```
\relative c {
  \key d \major \time 4/4 \clef "bass"
  d4p\< e8[( d]) fis4\!-. cis'-. |
  d1"\f | d1 \bar ."
```



- Note names¹: c d e f g a b, -is for sharp, -es for flat
- Relative mode: intervals larger than fifth need ' or ,, otherwise no modif.
- Durations: 1, 2, 4, 8 for whole, half, quarter, eight; . for dot, e.g. 4.;
 repeated durations not required
- Ties: ~ after duration
- Time signature, key, clef
- Dynamics: $\ppp, ..., \fff, \$ and $\$... $\$! for hairpins
- Slurs: (and) after the notes
- Beaming: Automatically; manually with [and] after the notes
- Articulations: e.g. -., ->, \marcato, etc. after the note
- Bar lines: | for single barline (barcheck, not required), \bar "|." for end, \repeat { music } for repeat structure.

¹Dutch by default; English note names available by \include "english.ly", German by \include "deutsch.ly"

Full Scores: Same Structure for all Parts / Movements

Creating Staves and Staff Groups

```
\version "2.13.17"
                                       \score {
                                          \new ChoirStaff <<
SMusic = \relative c'' 
                                            \new Staff {
  c4\p d8[( c]) e4-. d-. |
                                              \new Voice = "Soprano" {
  c1 \bar "|."
                                                \dynamicUp \SMusic
SLyrics = \Iyricmode {
                                            \new Lyrics = "SLyrics"
  Oh, be __ hap --- py now!
                                                \lyricsto "Soprano" \SLyrics
AMusic = \relative c'' {
                                            \new Staff {
                                              \new Voice = "Alto" {
  g4 f4 e4 f
  e1 \bar "|."
                                                \dynamicUp \AMusic
ALyrics = \lyricmode {
                                            new Lyrics = "ALyrics"
  Oh, be hap - py now!
                                                \lyricsto "Alto" \ALyrics
                                         >>
                                 be_ hap - py
                                               now!
                            Oh.
                                be
                                     hap - py
                                               now!
```

- Music can be assigned to variables!
- Score structure is built using \new (StaffGroup|ChoirStaff|Staff|Lyrics|Voice) ...
- A single staff and voice will be implicitly created if some music is given (useful for simple scores consisting of only one staff)
- Delimiter are braces { }, their contents appear sequentially
- Parallel contents (e.g. parallel staves) are in << >>

Problems with large works (many instruments and movements)

Each movement has the same structure (some instruments might be missing), only the variable names will be different.

E.g. Opus with 23 instruments, 12 movements: 276 individual staves (excluding groups), same number of staves in instrumental parts, etc.

Each full score has exactly the same structure!

Image: You want to change the instrument order (because your publisher wants that)...

Why not automate it?!?!?

LilvPond is written in C++ and Guile / Scheme: extensible via Scheme

LilyPond uses Guile (Scheme dialect) as scripting language

```
\version "2.13.18"
%LSR contributed by Jav Anderson.
                                               #(define (octavize music t)
                                                (if (eq? (ly:music-property music 'name)
#(define (octave-up m t)
                                                       EventChord)
 (let * ((octave (1- t))
                                                      (ly:music-set-property! music
      (note (ly:music-deep-copy m))
                                                             'elements (oct-chord
      (orig-pitch (ly:music-property m
                                                            (ly:music-property music
              pitch))
                                                             'elements) t)))
      (pitch (ly:make-pitch
                                                music)
        (ly:pitch-notename orig-pitch)
                                               makeOctaves = #(define-music-function
        (ly:pitch-alteration orig-pitch))))
                                                     (parser location arg mus) (integer?
  (set! (ly:music-property note 'pitch)
                                                     lv:music?)
         pitch)
                                                (music-map (lambda (x) (octavize x arg))
  note))
                                                      mus))
#(define (oct-chord elements t)
 (cond ((null? elements) elements)
                                               \relative c' {
     ((eq? (ly:music-property (car
                                                 \time 3/8
           elements) 'name) 'NoteEvent)
                                                 \key gis \minor
                                                 \makeOctaves #1 { dis8( e dis') " dis8.(
       (cons (car elements)
             (cons (octave-up (car
                                                       cis16 b8}
                    elements) t)
                                                 \makeOctaves #-1 { ais ' gis dis ) cis ( dis
                   (oct-chord (cdr
                                                       <dis gis'>) }
                          elements) t))))
```

The original example with OrchestralLily: much less code!

```
\version "2.13.17"
SMusic = \relative c'' 
 c4 p d8[(c]) e4-.d-.
SLyrics = \Iyricmode {
 Oh, be __ hap — py now!
AMusic = \relative c'' 
 g4 f4 e4 f
 e1 \bar "|."
ALyrics = \Iyricmode {
 Oh, be hap --- py now!
```

```
\include "orchestrallily/orchestrallily.ily"
\createScore #"" #'("Ch")
```



Creating score for Movement for given instrument(s) or group(s) (see below)

\createScore #"Movement" #'("Instruments" "or" "Groups")

OrchestralLily takes all score information from appropriately named variables:

Form of the variables used by OrchestralLily

[Movement] [Instrument] Identifier

The (optional) Movement and Instrument (or Group) can be chosen arbitrarily, but need to coincide with the ones given in the \createScore command. *Identifier* can be any of the list on the next slide.

Examples:

CadenzaSMusic ... Music for Soprano, piece "Cadenza" CadenzaSLyrics ... Music for Soprano, piece "Cadenza"

CadenzaIIKey ... Key for "Cadenzall" for all instruments and groups

VaClef ... Clef for Viola for all pieces

More specific settings override (e.g. CadenzaSKey overrides CadenzaKey)

All variable name modifies used by OrchestralLily

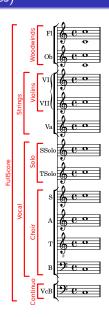
Lyrics for vocal voices (multiple stanzas!)
Clef for (movement+)instrument
Key for movement(+instrument)
Time signature for movement
Special settings for movement+instrument
More settings for movement+instrument
Displayed movement title
Displayed movement title for quiet instruments
Transposition pitches
Explicit voice (override automatic generation)
Explicit staff (override automatic generation)
fications Context modifications
Displayed instrument name (begin of score)
Short name (subsequent lines)
Instrument for MIDI generation

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Instrumental Staff Gropups (Pre-Defined Order)

Score Structure (Inherent Hierarchy of Orchestral Scores)

- Each instrument is named using its standard abbreviation (VI, VII, Va, Vc, FagI, FagII, ObI, ObII, S, A, T, B, O, etc.)
- Each group of identical instruments (e.g. Violins, flutes, oboes, etc.) also use their standard abbreviation (V, FI, Ob, etc.); sharing same staff or curly braces for grouping
- Groups of instruments: Wd (Woodwinds), Br (Brass), Str (Strings, except cellos/basses), Solo (all vocal soloists), Choir (S, A, T, B), Vocal (Solo + Choir); square brackets for grouping (except soloists no visible bracket)
- Several score types:
 - FullScore (same instruments share a staff),
 LongScore (two staves for identical instruments)
 - VocalScore (Solo+Choir, Piano reduction "P")
 - ChoralScore (only vocal voices, no accompaniment)
 - etc.



- Requirements for Professional Music Publishing
- 2 LilyPond for Music Typesetting
- Structure of a Score
- OrchestralLily
 - The sample music
 - Full Score
 - Instrumental parts
 - Cue Notes
 - Transposition
 - Vocal Score
 - Modifying Individual Staves
 - Special Types of Staves (Figured Bass, Drum, Tablature)
- Text parts of Editions: Preface & Cover
- **6** Templates

The sample music

Music definitions in the file "music-definitions.ily"

```
\include "orchestrallily/orchestrallily.ily"
\include "orchestrallily/olv_settings_names.ilv"
\header {
  title = "A cadenza"
CadenzaPieceNameTacet = "Cadenza tacet"
% Flute and Violin:
CadenzaFIIMusic = \relative c'' { e4 a g b, | c1 \bar "|." }
CadenzaVIMusic = \relative c'' {
 c16[ege]d[faf]e[gec]b[dbg]|
 c1 \bar "|."
% The vocal voices:
CadenzaSMusic = \relative c'' {
  c4\p d8[( c]) e4-. d-. | c1 \bar "|." }
CadenzaSLyrics = \lyricmode {
  Oh, be __ hap — py now! }
CadenzaAMusic = \relative c'' {
  g4 f4 e4 f | e1 \bar "|." }
CadenzaALyrics = \lyricmode {
  Oh, be hap - py now! }
% Continuo: Organ / Celli / Bassi / Bassoon
CadenzaBCMusic = \relative c { c4 f4 g g, | c1 \bar "|." }
CadenzaFiguredBassMusic = \figuremode {
  s4 <6>8 <5> <6 4>4 <5 3> | s1
```

- External include file
- Contains all music and lyrics definitions
- All variables start with "Cadenza"
- Defines a global work title
- Defines a tacet title

```
\version "2.13.17"
\include
"orchestrallily/oly_settings_fullscore.ily"
\include "music—definitions.ily"
\setCreateMIDI ##t
\setCreatePDF ##t
\createScore #"Cadenza" #'("FullScore")
```

A cadenza



- Compilable LilyPond file (See compilation)
- Includes our "music-definitions.ily"
- Generate score for "FullScore"
- Create MIDI and PDF output (Listen!)
- OrchestralLily knows e.g. bass clef for the continuo (overriding is possible).
 Also e.g. C-clef for Viola or Trombone

Oboe I

Generating Instrumental parts

Cadenza tacet

Instrumental parts

```
\version "2.13.17"
\include "music-definitions.ily"
\include
  orchestrallily / oly_settings_instrument.ily"
\header { instrument = \VIInstrumentName }
\createScore #"Cadenza" #'("VI")
                 A cadenza
                                     Violino I
```

- Same method to generate individual instrumental part than full score
- "instrument" name header field used

\version "2.13.17" \include "music-definitions.ily" \header { instrument = \OblInstrumentName } \createScore #"Cadenza" #'("Obl") A cadenza

 If no music is defined for a desired instrument, a "Tacet" header is printed Instrumental parts

Working with cue notes: Visible in part, hidden in full score

```
\addQuote #"Flute1" \CadenzaFIIMusic

CadenzaFIIIMusic = \relative c'' {
\namedCueDuring #"Flute1" #UP "Fl.1"
\"Fl.2" { R1 } |
\g1 \bar "|."
}
```

```
\version "2.13.17"
\include "music-definitions.ily"
\include "music-definitions-flute2.ily"

% The Flute 2 part:
\createScore #"Cadenza" #'("FIII")
```

A cadenza



- Quotable music defined with \addQuote (name assigned)
- Cue notes added directly in Flute 2 part
- Using \cueDuring or \namedCueDuring for instrument names

 Instrumental part displays cue notes

```
\version "2.13.17"
\include "music-definitions.ily"
\include "music-definitions-flute2.ily"

% remove the cues in Flute 2:
\createNoCuesScore #"Cadenza" #'("FlLong")
```

A cadenza



- Full scores or combined flute parts should not show cue notes
- Use \createNoCuesScore instead of \createScore

Instrumental parts

Transposing parts / Transposing instruments

- Transposing a whole piece (e.g. Schubert song for bass/alto voice)
- Transposing instrument (sounding pitch different from written pitch); e.g. Clarinets in B flat, E flat; Horn in D; etc.

```
\version "2.13.17"
\include "music-definitions.ilv"
% We need to give the key explicitly,
% so that it will also be transposed:
CadenzaVIKey = \key c \major
% Transpose to g major
CadenzaVITransposeFrom = g
\createScore #"Cadenza" #'("VI")
```

A cadenza



- TransposeFrom and TransposeTo
- If not given, c is assumed
- Key should always be explicitly given (otherwise default will be C major for transposed(!) output)

Vocal Score

Vocal Score: Choir and Piano Reduction

```
CadenzaPIMusic = \relative c'' {
  \twoVoice {
    c16 [ e g e] d[ f a f] e[ g e c] b[ d b g] |
    } {
    e4 a < g c>4 < b f>4
} | % 2
    <c g e>1 \bar "|."
}
CadenzaPIIMusic = \relative c {
    <c g'>4 f < g c>4 < g d'> | % 2
    <c c,>1 \bar "|."
}
```



- Piano reduction defined like any other music
- "PI" (right hand) and "PII" (left hand) as names
- \twoVoice {...} {...} used for temporary voice splitting (stemp up/down)

Very short!

Modifying Individual Staves and Voices

Suppose we now want to modify the vocal score so that:

- vocal staves are smaller
- Soprano noteheads colored red
- Alto lyrics printed italic

```
\version "2.13.17"
\include "music-definitions.ily"
CadenzaSStaffModifications = \with {
  fontSize = #-3
  \override StaffSymbol #'staff-space
       \#(magstep -3)
Cadenza A Staff Modifications =
     \ CadenzaSStaffModifications
CadenzaChStaffModifications =
     \ CadenzaSStaffModifications
CadenzaALyricsModifications = \with {
     \override LyricText #'font-shape =
      #'italic }
CadenzaSVoiceModifications = \with {
      override NoteHead #'color = #red
\createScore #"Cadenza" #'("VocalScore"
```



- All modifications only in
 - *StaffModifications,
 - *VoiceModifications and
 - *LyricsModifications variables

Figured bass

```
\version "2.13.17"
\include "music-definitions.ily"
CadenzaFiguredBassMusic = \figuremode {
  s4 <6>8 <5> <6 4>4 <5 3> | s1
\(\rightarrow\) createScore #"Cadenza" #'("Continuo")
```

A cadenza



- Figured bass is entered as *FiguredBassMusic
- Figures placed inside \figuremode as < nr >.
- Automatically used by the "Continuo" instrument group (and similar)

Drum and Tab staves

```
\version "2.13.17"
\include "orchestrallily/orchestrallily.ily"
\header {
  title = "Drum and tab staves"
  composer = "Anonymous"
drumIMusic = \drummode { crashcymbal4 hihat8
       halfopenhihat }
drumIIMusic = \{ c4 c4 \}
tabularMusic = \{ c4 < e g > 8 d16 r16 \}
\orchestralScoreStructure #'(
  ("druml" "DrumStaff" ())
  ("drumII" "RhythmicStaff" ())
  ("tabular" "TabStaff" ()))
\orchestralVoiceTypes #'(
  ("drumI" "DrumVoice")
  ("tabular" "TabVoice"))
\createScore #"Cadenza" #'("drumI" "drumII"
      "tabular")
```

Drum and tab staves



- OrchestralLily can be extended to other staff types
- Drum-/TabStaff already pre-defined

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- Written in plain LATEX, using the editionkainhofer.sty package.
- Macros for nice title page (colored background) and paper size (both depending on score type).
- PDF of LilyPond score included via pdfpages package.
- Table of contents also includes the movements of the score (automatically generated by OrchestralLily!)







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Templates: Generating file and directory hierarchy for a complete edition

- Music definitions for each movement have the same structure
- Each score file also has the exact same structure
- ⇒ Collect all information about score in one file, generate all input files (Makefile, music definitions, LaTeX, etc.) automatically with orchestrallily/generate_oly_score.py!

```
output_dir": "Cadenza",
"version": "2.13.11",
"template": "EK_Full",
"defaults": {
  "title": "A test for OrchestralLily",
  "composer": "Reinhold Kainhofer".
  "composerdate": "1977-".
  "vear": "2009".
   publisher": "Edition Kainhofer".
  "scorenumber": "EK-1040".
  "basename": "Cadenza".
  "parts": [
    {"id": "Cadenza", "piece": "A cadenza",
     "piecetacet": "Cadenza tacet"}.
  "instruments": [" FII"." VI"."S"."A"." Continuo"].
  "vocalvoices": ["S", "A"],
  "scores": ["Full", "Vocal", "Choral"].
"scores": ["Cadenza"],
"latex": {},
```

Resulting file structure:

```
./Cadenza/
    orchestrallilv/
    Makefile
    Cadenza_Music_Cadenza.ily
    Cadenza_Score_Choral.ly
    Cadenza_Score_Full.ly
    Cadenza_Score_Vocal.lv
    Cadenza_Instrument_S.ly
    Cadenza_Settings_Global.ily
    Cadenza_Settings.ilv
    Cadenza_Settings_*Score.ily
    _ TeX_Cadenza_Include_Bio.itex
   __ TeX_Cadenza_Include_Coverpage.itex
    TeX_Cadenza_Include_KritBericht.itex
    TeX_Cadenza_Score_Full.tex
    TeX_Cadenza_Score_Vocal.tex
    TeX_Cadenza_Settings.itex
```

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Availability of OrchestralLily

OrchestralLily on the Web: Source code and Homepage

- Git repository (source code):
 http://repo.or.cz/w/orchestrallily.git
- Homepage: http://reinhold.kainhofer.com/orchestrallily/

License: Dual-licensed under CC BY-NC 3.0 and GPL v3.0

- Creative Commons: Attribution Non-commercial (BY-NC) 3.0 license
- GNU Public License: GPL v3.0

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- The LATEX Community!
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