ConTEXt

title   : ConTEXt User Modules
subtitle : LilyPond Connections (Music Typesetting)
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This module serves to include LilyPond music directly in the ConTEXt source, just as METAPOST code can be.

It is supposed to work only with LilyPond's stable version 2.12.

Complete list of options:

option	default	comment
staffsize	20	in pt
indent	0pt	first line indent
time	yes	count time? (i.e. show time signature, set bars, split line)
clef	yes	show clef?
linewidth	localhsize	
betweensystemspace	54pt	space between systems
height	textheight	
align	?	default depends on fragment=...
fragment	no	whole staff line or only snippet?
barnumbers	no	show numbers of measures?
showempty	no	drop empty staves?
seriffont	"TeX Gyre Schola"	font for e.g. lyrics
sansfont	"LMSans10"	font for e.g. chords
monofont	"LMTypewriter10"	normally not used

TODO: Proper support for multipage results.

TODO: LilyPond —> ConTEXt.

Commented Source

As usual, we use a prefix for buffers, \getparameters etc.:

```
1   \writestatus{loading}{LilyPond module}
```

```
2   \startmodule[lilypond]
```

```
3   \unprotect
    \def\??lily{lilypond-}
```

Define the text snippets to be placed around fragments. Since LilyPond uses similar syntax to TeX, we must do some catcode fiddling.

```
4   \def\lily!slash{/}
```

```
5   \bgroup
    \catcode`\/=\@@escape
    /catcode`/\=/@@other
    /catcode`/#=/@@other
    /catcode`/<=/@@begingroup
    /catcode`/>=/@@endgroup
    /catcode`/{=/@@other
    /catcode`/}=/@@other
    /catcode`/%=/@@other
    /catcode`/-=/@@letter
    /gdef/lily!fragmentprefix<
    /string^^J
    /string^^J
```

```
    {/string^^J
    >

6   /gdef/lily!fragmentsuffix</string^^J
    }/string^^J
    >

7   /gdef/lily!prefix</string^^J
    /string^^J
    /string^^J
    \version "2.12.0"/string^^J
    \layout {/string^^J
    /iflily!showempty/else
     \context { \RemoveEmptyStaffContext } % MUST come first/string^^J
     \context { \Score \override VerticalAxisGroup #'remove-first = ##t }/string^^J
    /fi
    /string^^J
    /iflily!time/else
     ragged-last = ##t/string^^J
     \context { \Score timing = ##f }/string^^J
     \context { \Staff \remove "Time_signature_engraver" }/string^^J
    /string^^J/fi
    /iflily!barnumbers/else
     \context { \Score \remove "Bar_number_engraver" }/string^^J
    /fi
    /string^^J
    /iflily!clef/else
     \context { \Staff \remove "Clef_engraver" }/string^^J
    /fi
    /string^^J
     #(define fonts
       (make-pango-font-tree
       /lilypond-seriffont/space
       /lilypond-sansfont/space
       /lilypond-monofont/space
      (/lily!slash/space/lilypond-staffsize/space 20)))/string^^J
    /string^^J
    }/string^^J
    \paper {/string^^J
     #(define dump-extents #t)/string^^J
     ragged-right = /iflily!align ##f/else ##t/fi/string^^J
     indent = /withoutpt/the/lily!indent\pt/string^^J
     line-width = /withoutpt/the/lily!linewidth\pt/string^^J
     vsize = /withoutpt/the/lily!vsize\pt/string^^J
     printpagenumber = ##f/string^^J
     oddFooterMarkup=##f/string^^J
     oddHeaderMarkup=##f/string^^J
     bookTitleMarkup = ##f/string^^J
     scoreTitleMarkup = ##f/string^^J
     ragged-bottom=##t/string^^J
     ragged-last-bottom=##t/string^^J
     between-system-padding = #0/string^^J
     between-system-space = /withoutpt/the/lily!betweensystemspace\pt/string^^J
```

```
    }/string^^J
    >
```

8 `/gdef/lily!hash<#>`
   `/egroup`

9 `\newdimen\lily!linewidth`
   `\newdimen\lily!vsize`
   `\newdimen\lily!indent`
   `\newdimen\lily!betweensystemspace`
   `\newif\iflily!showempty`
   `\newif\iflily!align`
   `\newif\iflily!clef`
   `\newif\iflily!time`
   `\newif\iflily!barnumbers`

10 `\newcounter\lily!figures`

Again, as usual, there is a `\setuplilypond` command that accepts the same parameters as `\lilypond` and `\startlilypond` do in their optional argument.

11 `\def\setuplilypond{%`
   `  \start\catcode`\#=\@@other%`
   `  \dosingleempty\dosetuplilypond%`
   `}`

12 `\def\dosetuplilypond[#1]{%`
   `  \stop% restore \catcode`\#`
   `  \getparameters[\??lily][#1]%`
   `}`

We set the following defaults:

13 `\setuplilypond`
   `  [staffsize=20,`
   `  indent=0pt,`
   `  betweensystemspace=54pt,`
   `  time=\v!yes,`
   `  clef=\v!yes,`
   `  align=?, % default depends on fragment=...`
   `  fragment=\v!no,`
   `  barnumbers=\v!no,`
   `  showshowemptyempty=\v!no,`
   `  seriffont="TeX Gyre Schola", % LilyPond default font`
   `  sansfont="LMSans10",`
   `  monofont="LMTypewriter10",`
   `  ]`

If you want to know which fonts of your system LilyPond can see with which names, try `lilypond -dshow-available-fonts any`. (The 3rd parameter is necessary, but can be anything.) There are a lot of restrictions, e.g. no fonts from the TEX tree (don't know why), only one face per font file etc.

`\startlilypond` is a multistage implementation, because end-of-line characters must be treated specially in the `\startlilypond`…`\stoplilypond` range.

```
14   \def\startlilypond{%
     \bgroup%
     \catcode`\#=\@@other%
     \dosingleempty\dostartlilypond%
     }
```

```
15   \def\dostartlilypond[#1]{%
     \obeylines%
     \dodostartlilypond[{#1}]%
     }
```

```
16   \long\def\dodostartlilypond[#1]#2\stoplilypond{%
     \egroup% from \startlilypond
     \bgroup%
```

The default of the `linewidth` parameter is the local `\hsize`.

```
17   \setlocalhsize
     \getparameters[\??lily][linewidth=\the\localhsize,height=\the\textheight,#1]%
     \lily!linewidth\dimexpr\getvalue{\??lily linewidth}\relax
     \lily!vsize\dimexpr\getvalue{\??lily height}\relax
     \lily!indent\dimexpr\getvalue{\??lily indent}\relax
     \lily!betweensystemspace\dimexpr\getvalue{\??lily betweensystemspace}\relax
```

The default of `align` depends on whether we typeset a fragment:

```
18   \@EAEAEA\doifelse\getvalue{\??lily align}{\v!yes}%
      \lily!aligntrue\lily!alignfalse
     \@EAEAEA\doif\getvalue{\??lily fragment}{\v!no}{%
      \@EAEAEA\doif\getvalue{\??lily align}?
        \lily!aligntrue
     }%
     \@EAEAEA\doifelse\getvalue{\??lily time}\v!yes
      \lily!timetrue\lily!timefalse
     \@EAEAEA\doifelse\getvalue{\??lily barnumbers}\v!yes
      \lily!barnumberstrue\lily!barnumbersfalse
     \@EAEAEA\doifelse\getvalue{\??lily showempty}\v!yes
      \lily!showemptytrue\lily!showemptyfalse
     \@EAEAEA\doifelse\getvalue{\??lily clef}\v!yes
      \lily!cleftrue\lily!cleffalse
```

We are using a counter to keep the different LilyPond pieces separate. This allows to typeset them only once, during the first run.

TODO: This won't work any longer once we pass the remaining vertical space to LilyPond.

```
19   %\global\advance\lily!figures\plusone
     \doglobal\increment\lily!figures
     \edef\lily!filename{\bufferprefix lilypond-\lily!figures}%\the
     %\writestatus{buffering}{\lily!filename}
     %\startmode[*\v!first]%
     \def\obeyedlines{\string^^J}%
     \convertargument#2\to\ascii
     \expanded{%
     \setbuffer[lilypond-\lily!figures]%\the
```

```
\lily!prefix
\lily!hash(set-global-staff-size \getvalue{\??lily staffsize})\string^^J%
\ifundefined{\??lily fragment}\else\lily!fragmentprefix\fi
%% TODO: Option "packed"
\ascii%
\ifundefined{\??lily fragment}\else\lily!fragmentsuffix\fi
}% expanded
\endbuffer%
```

Generating a PDF directly always creates a whole page, so we generate EPS first.

20   `\def\LP{texmfstart --ifchanged="\lily!filename.eps" --exec bin:lilypond -dback-end=eps -dno-gs-load-fonts -dinclude-eps-fonts -ddelete-intermediate-files "\lily!filename.tmp"}`

It would be nice, if `-ddelete-intermediate-files` would delete all useless intermediate files. More possible options in `lily.scm`.

21   `\def\PDF{texmfstart --ifchanged="\lily!filename.eps" pstopdf "\lily!filename.eps"}`

The following line is needed for LuaTEX, where buffers are kept in memory in contrast to other (older) flavours of TEX where they're written to a file automatically. We have to require writing to a file explicitly with `\savebuffer`.

22   `\ifx\directlua\undefined \else \savebuffer[lilypond-\lily!figures]\fi`

23
```
\executesystemcommand{\LP}%
\doif\jobsuffix{pdf}{%
 \executesystemcommand{\PDF}%
}%
\doifelse\jobsuffix{pdf}
 {\def\lily!img{\lily!filename .pdf}}%
 {\def\lily!img{\lily!filename .eps}}%
```

TODO: Get the relevant dimension directly from LilyPond, to place the instrument name into the left margin for short snippets as well.

If we are not in the middle of some text, we have to check whether LilyPond created an image that is wider than requested: It places the instrument names in the left margin.

24
```
\ifvmode
 \getfiguredimensions[\lily!filename.pdf]%
 \leavevmode%
 \newdimen\FigWidth
 \FigWidth=\figurewidth
 \ifdim\FigWidth>\localhsize
  \!!dimena=\localhsize
  \advance\!!dimena by-\FigWidth
  \noindent\hskip\!!dimena
 \fi
\fi
\externalfigure[\lily!img]%
\egroup%
}%
```

For short snippets, we define an inline alternative to our start/stop pair:

25 `\def\lilypond{\dosingleempty\dolilypond}`

26 `\def\dolilypond[#1]#2{\startlilypond[#1]#2\stoplilypond}`

27 `\stopmodule`

28 `\protect \doifnotmode{demo}{\endinput}`

End of file

29 `\starttext`

30 `\startbuffer[sample]`
    `\subject{Telemann, TWV 40:11}`
    `\startlilypond`
    ` \relative c' {`
    `  \set Staff.instrumentName = flute`
    `  \key fis \minor`
    `  \time 3/4`
    `  \partial 4`
    `  r8 fis'8 | fis4. cis8 a cis | fis, a cis fis a fis |`
    `  b, d fis b d b | eis,, gis cis eis gis b, |`
    `  a fis' gis, fis' cis eis | fis,4 r8`
    `  a' gis fis | e gis, a e' fis cis |`
    `  d fis, gis b e d | cis4 \trill r8`
    `  cis b a | b dis e gis cis, b |`
    `  a e' dis fis b, a | gis4 \trill r8`
    ` }`
    `\stoplilypond`
    `\stopbuffer`

31 The input
    `\typebuffer[sample]`
    is typeset as
    `\getbuffer[sample]`

32 `\type{\startlilypond}` accepts options, as in`\crlf`
    `\type{\startlilypond[staffsize=24, linewidth=14cm, indent=5cm, time=no, clef=no]}`:
    `\nobreak`
    `\startlilypond[staffsize=18,linewidth=14cm,indent=5cm,time=no,clef=no]`
    ` \relative c' {`
    `  \key fis \minor`
    `  \time 3/4`
    `  \partial 4`
    `  r8 fis'8 | fis4. cis8 a cis | fis, a cis fis a fis |`
    `  b, d fis b d b | eis,, gis cis eis gis b, |`
    `  a fis' gis, fis' cis eis | fis,4 r8`
    `  a' gis fis | e gis, a e' fis cis |`
    `  d fis, gis b e d | cis4 \trill r8`
    `  cis b a | b dis e gis cis, b |`
    `  a e' dis fis b, a | gis4 \trill r8`
    ` }`
    `\stoplilypond`

33 It is also possible to mix text and music:
     `\lower 8.2pt\hbox{\lilypond[fragment=true,staffsize=16,time=no,clef=no]{g'}}` is a g.

34 TODO: The `\type{\lower}` in the example above should not be necessary.

35 `\stoptext`