LilyPond Music Engraving Workshop

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For music teachers, choir directors, arrangers, composers, and anyone else who appreciates beautiful sheet music

1   Installation or The Web

To install, go to lilypond.org/download and choose the version for your machine. Install as you would with any software. Linux users can also use apt or the like.

Visit http://lilybin.com, if you don't want to or can't install lilypond.

2   A Scale

The default input on lilybin.com is a good place to start. Output:

Input:

```
1  % LilyBin
2  \score{
3      {
4          c'
5      }
6      \layout{}
7      \midi{}
8  }
```

Note: I have added line numbers to the input file. These are not part of the input, but are here so I can direct your attention to individual lines.

Explanation:

Line 1: a comment. Comments begin with % and continue to the end of the line. This one simply points out that I borrowed from their website. All comments are optional. I use them to remind myself of source material, the common words for a hymn tune, etc.

Line 2: score is the fundamental unit of musical composition in lilypond. Commands in lilypond start with a backslash and are usually musical terms. This is the simplest score that includes midi output. Some commands wrap things in braces. This score continues to line 8.

Line 3: group notes in additional braces. This keeps it separate from things like the midi command.

Line 4: Notes are just their letters, so c in this case. The letters are always lowercase. The apostrophe indicates up one octave. The default c is the one in the bass staff. We could go up to the c in the treble staff with a second apostrophe. To go lower, omit the apostrophe or use commas.

By default we get quarter notes.

Lines 6 and 7: to get midi output include layout and midi commands.

That was a lot to say about a one note song. Now, let's turn that into a scale.


```
1  \score{
2      {
3          c' d' e' f' g' a' b' c''
4      }
5      \layout{}
6      \midi{}
7  }
8  \version "2.18.2"
```

Explanation:

I have omitted the opening comment.

Line 3: extend the notes up the c major scale. Note that the higher c has two apostrophes.

Line 8: a version command. This is useful so your friends don't try to compile your file on an older version of lilypond without warning.

All those apostrophes can be annoying.

```
1  \score{
2      \relative c' {
3          c d e f g a b c
4      }
5      \layout{}
6      \midi{}
7  }
8  \version "2.18.2"
```

Output: same as before.

Explanation:

Line 2: relative means each note will be close to the prior note. Our first note is close to middle c. We will only use apostrophes if the note is too low and commas only when it is too high.

3   A Hymn (Fragment)

Here we will begin to construct an SATB arrangement of Amazing Grace. Eventually, it will look like an *a cappella* choir anthem. Our tune comes from the 1910 Free Methodist Hymnal.

3.1   One Vocal Part

A soprano line, without lyrics.


```
1  \score{
2      \relative c' {
3          \key d \major
4          d fis8 a d b a4 | b a8 fis e4 d |    fis a b8 d cis b | a gis a2. \bar "|."
5      }
6      \layout{}
7      \midi{}
8  }
9  \version "2.18.2"
```

Explanation:

Line 3: a key is a note and major or minor. All need a backslash except the pitch.

Line 4: has several new features.

- sharps: add `is` to the note (Dutch abbreviation for sharp), as in `fis`.

- flats: use `es` as in `bes`.

- duration:

  - 1 whole
  - 2 half
  - 4 quarter (the initial default)
  - 8 eighth
  - 16 sixteenth

- dotted notes: add a dot as in our last note: `a2.`

- barline checks: add | where you think a bar should be, uses:

  - ease editing with visual measure division in the input
  - lilypond will warn of possible counting errors, if your lines don't match output

- a double bar line: `\bar ''|.''`, more choices below

Keep in mind that lilypond will not conform your notes to the key. It assumes you have asked for the correct pitch. If you are out of the key, it will add an accidental. Scanning for accidentals is essential during editing.

More bar choices:


```
\relative {
    f'1 \bar "|"
    f1 \bar "."
    g1 \bar "||"
    a1 \bar ".|"
    b1 \bar ".."
    c1 \bar "|.|"
    d1 \bar "|."
    e1
}
```

Search for "lilypond bar" for even more examples.

3.2 Adding Altos

Let's organize a bit and add the alto part in typical choral style.

Features of output:

- two parts on one staff

- stems up for soprano, down for alto

Later we will see piano music with chords. One of the templates (see pianoreduction.template.ly) shows piano reduction from separate parts.

```
1  sopranoLine = {
2      d4 fis8 a d b a4 | b a8 fis e4 d |    fis a b8 d cis b | a gis a2.
3  }
4  altoLine = {
5      d4 d d d | d8 g fis d cis4 d | d e fis e | e e2.
6  }
7  \score{
8      \new ChoirStaff <<
9          \new Staff = "highVoices" <<
10             \new Voice = "sopranos" {
11                 \voiceOne
```

```
12                       \relative c' {
13                            \key d \major
14                            \sopranoLine
15                            \bar "|."
16                       }
17                  }
18             \new Voice = "altos" {
19                       \voiceTwo
20                       \relative c' {
21                            \altoLine
22                       }
23                  }
24          >>
25       >>
26       \layout{}
27       \midi{}
28 }
29 \version "2.18.2"
```

Explanation:

Line 1-3: name the soprano line using = {} to wrap the notes. Same on Lines 4-6 for altos. Organization soothes the mind. Removing notes from the middle of the score makes editing easier and we can refer to them by name at later times.

Lilypond names can only contain letters, no numbers, spaces, or punctuation. Roman numerals and capital letters come in handy here. Once a line has a name, you can refer to it in the score by pretending it is a command.

Line 2: the music from the last example, except the first note is explicitly a quarter note. Lilypond will transfer durations from line to line. Always include the duration on the first note of a passage.

Line 8: the new ChoirStaff will group the staves together with a big bracket, once we add the low parts. (We can't see it yet.) Everything between the << on line 8 and the >> on line 25 belongs to this giant staff.

Line 9: add one Staff for the high parts called highVoices, this name is documentation, we won't refer to it.

Lines 10 and 18: add one Voice for each high part, sopranos and altos.

Lines 11 and 19: voiceOne uses the up stems, voiceTwo the down stems.

Line 13: adds the key, we only need this for one part, they are sharing the staff.

Lines 14 and 21: refer to the notes from lines 1-3 and 4-6 by name as a command.

Line 15: add a bar line, only one part in the whole ChoirStaff needs this.

3.3 Adding the Lower Parts

```
 1  sopranoLine = {
 2      d4 fis8 a d b a4 | b a8 fis e4 d |    fis a b8 d cis b | a gis a2.
 3  }
 4  altoLine = {
 5      d4 d d d | d8 g fis d cis4 d |    d e fis e | e e2.
 6  }
 7  tenorLine = {
 8      fis4 a8 fis b g fis4 | d' d8 a a g fis4 |    a a a a8 d | cis b cis2.
 9  }
10  bassLine = {
11      d4 d d d | d e a, d |    fis g fis8 g a4 | a, d2.
12  }
13  \score{
14      \new ChoirStaff <<
15          \new Staff = "highVoices" <<
16              \new Voice = "sopranos" {
17                  \voiceOne
18                  \relative c' {
19                      \key d \major
20                      \sopranoLine
21                      \bar "|."
22                  }
23              }
24              \new Voice = "altos" {
25                  \voiceTwo
26                  \relative c' {
27                      \altoLine
28                  }
29              }
30          >>
31          \new Staff = "lowVoices" <<
32              \new Voice = "tenors" {
33                  \voiceOne
34                  \relative c {
35                      \clef bass
36                      \key d \major
37                      \tenorLine
38                  }
39              }
40              \new Voice = "basses" {
41                  \voiceTwo
42                  \relative c {
43                      \bassLine
44                  }
45              }
46          >>
47      >>
48      \layout{}
49      \midi{}
50  }
51  \version "2.18.2"
```

Explanation:

Lines 7-12 define low part music just as we did for the higher parts. Note the occasional use of comma and apostrophe to get the right octave on the pitches.
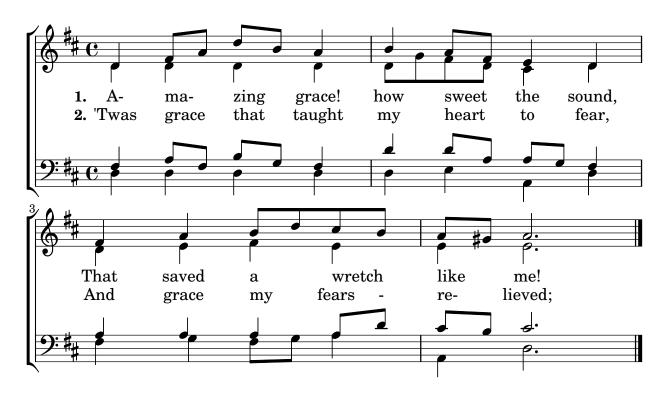
Lines 31-45 are just like the high voice parts with a couple of exceptions.

- names have been changed
- bass clef (line 35)
- pitches are relative to c in the bass staff (lines 34, 42)
- no bar command

If we save this as a template, we can have a new hymn by changing only the various lines, the relative starting pitch, and the key.

3.4 Lyrics

Adding words is just a simpler special kind of line. But, there are special rules for aligning words with notes.


```
1  sopranoLine = {
2      d4 fis8 a d b a4 | b a8 fis e4 d |    fis a b8 d cis b | a gis a2.
3  }
4  altoLine = {
5      d4 d d d | d8 g fis d cis4 d |    d e fis e | e e2.
6  }
7  tenorLine = {
8      fis4 a8 fis b g fis4 | d' d8 a a g fis4 |    a a a a8 d | cis b cis2.
9  }
10 bassLine = {
11     d4 d d d | d e a, d |    fis g fis8 g a4 | a, d2.
12 }
13 verseI = \lyricmode {
14     \set stanza = #"1."
```

```
15        A– ma– _ zing _ grace ! how sweet _ the sound , That saved a _ wretch _ like _ me!
16  }
17  verseII = \lyricmode {
18      \set stanza = #"2."
19      'Twas grace _ that _ taught my heart _ to fear , And grace my _ fears − re− _ lieved ;
20  }
21  \score{
22      \new ChoirStaff <<
23          \new Staff = "highVoices" <<
24              \new Voice = "sopranos" {
25                  \voiceOne
26                  \relative c' {
27                      \key d \major
28                      \sopranoLine
29                      \bar "|."
30                  }
31              }
32              \new Voice = "altos" {
33                  \voiceTwo
34                  \relative c' {
35                      \altoLine
36                  }
37              }
38          >>
39          \new Lyrics = "verseI"
40          \new Lyrics = "verseII"
41          \new Staff = "lowVoices" <<
42              \new Voice = "tenors" {
43                  \voiceOne
44                  \relative c {
45                      \clef bass
46                      \key d \major
47                      \tenorLine
48                  }
49              }
50              \new Voice = "basses" {
51                  \voiceTwo
52                  \relative c {
53                      \bassLine
54                  }
55              }
56          >>
57          \context Lyrics = "verseI"  \lyricsto "sopranos" \verseI
58          \context Lyrics = "verseII" \lyricsto "sopranos" \verseII
59      >>
60      \layout{}
61      \midi{}
62  }
63  \version "2.18.2"
```

Explanation:

Three steps to adding lyrics:

- type the poem in verses (lines 13-20)

8

- place the lyrics in the ChoirStaff (lines 39 and 40)

- link the lyrics to a part with the context command (lines 57 and 58)

Details:

Lines 13 and 17: use lyricmode to indicate that a line has words instead of notes.

Lines 14 and 18: use the set stanza command to number the verses (if desired). Pay attention to the strange use of #. The contents of the quotes are almost arbitrary. Try "1,5." if you want to indicate the words will be used again for verse 5.

Lines 15 and 19: type out the poem. Use spaces between the syllables. Each syllable binds to one note. Use underscore to use up more than one note. Punctuation will appear in the finished work, so mind your grammar.

This concludes our hymn fragment. Feel free to complete it with the other half of each verse and additional verses.

4 Other Basic Concepts

So far, we have seen how to choose a key and a clef. We have seen sharps (but not flats). We have seen quarter notes, eighth notes, and dotted half notes, but not others. What we have seen is dwarfed by what we have not.

I almost called this section Eine Kleine Not Music. I am going to show how to engrave a bunch of different musical notations without making a coherent song.


```
1   \score{
2       \relative c' {
3           \key d \minor
4           \time 3/4
5           d4 \p ees a ~ a r2 \bar "||"
6           \time 2/2
7           g1 \f
8           \compressFullBarRests
9           R1*24
10          a2 ( bes )
11
12          \key f \major
13          \time 9/8
14          \repeat volta 2 {
15              a8.^\markup{\italic {tuti fruiti}} b16 c8 \mf  d4. e4. | ees8 d c bes4. a
16          }
17      }
18      \layout{}
19      \midi{}
20  }
21  \version "2.18.2"
```

Explanation:

Line 3: a minor key

Line 4: 3/4 time

Line 5: new features:

- `\p` dynamic mark
- `ees` an e flat (with an accidental since e is not flat in d minor)
- `~` is for tie to span measures
- `r` is for rest, use durations just like for notes
- the line ends with a simple double bar to set off the time change

Line 6: cut time, uses slashed C, like 4/4 uses C

Line 7: new features:

- whole notes have duration 1
- `\f` another dynamic mark

Line 8: compressFullBarRests to avoid lots of empty measures.

Line 9: big R for long rests, duration is beats in the measure, times (*) number of measures, needs compressFullBarRests from line 8.

Line 10: slurs use parantheses, leave the first note on the outside.

Line 12: the key command shows the key signature without bar lines, even if the sharps and flats are the same.

Line 13: 9/8 time (hello Fanny Crosby and Phoebe Knapp).

Line 14: repeat volta with a count of total times played, put music in braces, indenting helps when editing

Line 15:

- dotted eighth notes, just use a dot (see dotted half notes from earlier)
- `^` put something above the staff
- `\markup` add musical advice as text, wrap it all in braces
- `\italic` use italic font, wrap text in braces if it has multiple words
- `\mf`, another dynamic marking
- 16 for sixteenth notes
- note accidentals for notes outside the key

5   Piano Music

Unlike voices and trumpets, pianos allow chords. Their music is often shown with a staff for each hand. This is worth exploring a bit.

```
1   rightHand = {
2       \partial2 \mark \default <d' f' a'>2\mp | <c' e'>4\> <c' f'> <bes f'> <a e'> |
3       <f c'>2 <f c'>2 | <e bes>4 <d a> <c g> <d a>\!\pp \mark \default \bar "||"
4   }
5   leftHand = {
6       \partial2 <d g >2 | <f c> <f c> | <bes, f>4 <a, e> <bes, f>  <c f> | <c f>2 <d g > |
7   }
8   \score {
9       \new PianoStaff <<
10          \new Staff <<
11              \new Voice = "pianotreble" {
12                  \key c \minor
13                  \transpose d c' { \rightHand }
14              }
15          >>
16          \new Staff <<
17              \clef bass
18              \new Voice = "pianobass" {
19                  \key c \minor
20                  \transpose d c { \leftHand }
21              }
22          >>
23      >>
24      \layout{}
25      \midi{}
26  }
27  \version "2.18.2"
```

Explanation:

Line 2: new features:

- for pickups use the partial command, say duration of mini-measure

- use mark with default to get unadorned rehearsal letters (letter sequencing or numbering is automatic)

- chords go inside <>, place durations after that

- \mp is one kind of dynamic mark, similarly for \pp

- \> begins a decrescendo wedge (ends on line 3 with \!), use \< for crescendo wedge (ending is the same \!)

- a \bar ''||'' is a lightweight double bar, here marking the end of a piano intro

Line 3: note the end of the decrescendo wedge \!.

Line 9 (ends on line 23): a PianoStaff gives us the nice brace grouping on the far left.

Lines 10-22: two staves, quite similar to the ones for choral music seen earlier

Line 13: transpose moves music from first note by the interval to the second note, here d in the bass staff becomes middle c, etc.

Line 20: transpose again, but here only by a full step down from d to c (both in the bass clef staff)

Originally, this song began in d minor. So, I typed in the notes for that key. I wanted to give the altos an opening solo, but the range seemed too high. So, I changed to c minor instead. That's why I used the transpose command.