



Faversham Associates Ltd

Lilypond

Using Lilypond and $\text{\LaTeX}$ to write music

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Gavin Bungay

`gavin.bungay@favershamassociates.com`

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I'm writing various articles about drumming and playing the guitar, using the mix of Lilypond and $\text{\LaTeX}$ to create the final output.

This document goes through a simple example that creates a single page with a staff with one note on it.

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1 Introduction

Lilypond is a program that produces musical scores using its own mark up language.¹ Unlike many modern score production programs, for example Sibelius and Finale, it does not use a GUI or WYSIWYG editor. Scores are written as text files, Lilypond compiles these files into the final annotated score.

L^AT_EX is a document production system, like Lilypond, a file containing source code, written in plain text, is compiled to produce the final output.

Lilypond can be used as a standalone product to produce scores as final documents, for example as PostScript or PDF files. It can also be integrated with L^AT_EX: scores can be inserted into L^AT_EX source code files and compiled together to create a final document - that's the way I'm using it.

I'm not going bore anyone arguing the case for Lilypond over and above any other musical annotation system, except to say, it works for me. I suspect the vast majority, will prefer the WYSIWYG approach. Lilypond is not the solution for them.

I like it because:

- It's free;
- It's open source;
- It's text, scores can be edited in the composer's favourite text editor;
- The markup language is open and well defined. The composer can therefore control precisely what the source files contain and therefore the final result;
- It's cross platform, versions exist for *nix, Mac and Windows;
- It integrates nicely with L^AT_EX, (I use L^AT_EX to product all my documents);
- It works the way my mind works, I can create a snippet and include it in multiple different places and documents without having to rewrite it in each one.

2 How it all Works

We're now ready to start creating scores and embedding them in out L^AT_EX documents. In outline, the process is as follows:

¹A markup language is a way of describing how to open or display information, the most well known is HTML; an HTML document not only contains the information to display, but also information describing how that information she be displayed



1. The original source code document is written in an hybrid of $\text{\LaTeX}$ and Lilypond native markup languages. By convention the file often is given the extension `.lytex`.

The Lilypond parts are delimited by being enclosed in a ‘Lilypond statement block’:

```
1 \begin{[<options>]}{lilypond}
2 {
3     % Lilypond code here ...
4 }
```

Listing 1: *The outline of a Lilypond statement block.*

where

`<options>` are valid Lilypond options;
% is the Lilypond comment start character (the same as with $\text{\LaTeX}$).

2. The Lilypond tool `lilypond-book` is used, from the command line to ‘pre-process’ the original `.lytex` source file to create an intermediary file. This file contains the original $\text{\LaTeX}$ code but the Lilypond source had been replaced by valid $\text{\LaTeX}$ code. By default the file has the same name as the original but with the extension `.tex`
3. The intermediary file is then compiled ‘in the usual way’, in my case by using `pdflatex`, to produce the final ‘output’ document.

A Simple Example

Below we are going to follow the steps above to create a very simple document that has a stave with a single ‘c’ note on it.

1. In a suitable directory, that we will refer to as `<CodeDir>`, create a file called `C.lytex` and put the following $\text{\LaTeX}$ and Lilypond code in it:

```
1 \documentclass[a4paper,12pt]{scrartcl}
2
3 \begin{document}
4
5 A \LaTeX\ document with a Lilypond score embedded in it.
6
7 \begin[fragment,relative]{lilypond}
8     c4
9 \end{lilypond}
10
11 After the score.
12
```



13 `\end{document}`

Listing 2: A simple $\text{\LaTeX}$ document with an embedded Lilypond score statement block.

2. In a terminal, navigate to the `<CodeDir>` directory and type the following command:

```
$ lilypond-book --pdf C.lytex
```

This command pre-processes the source file, it echoes a series of progress messages to the terminal, if successful the last one will be something like:

```
Writing '<CodeDir>/C.tex'
```

Where `<CodeDir>` is the fully expanded path of the location of the `C.lytex` source file.

Listing the contents of `<CodeDir>` shows that the directory now contains, in addition to the original `C.lytex` file, the following:

- A file called `C.tex`;
- A file called `C.dep`
- A file called `snippet-map<*>.ly`;
- A file called `snippet-names<*>.ly`;
- A file called `tmp<*>.aux`;
- A two letter named sub-directory (mine was called `bd`) containing a load of files called `lily-<*>.<*>` .

Where `<*>` is a variable string, not necessarily the same in each instance.

Each time the source lytex file is compiled a new set of these files is created and one can end up being swamped in these, so it is a good idea to deleted them all before each recompile.

3. Compile the file `C.tex` that was created in the pre-processing:

```
$ pdflatex C.tex
```

This creates a file `C.pdf`, which contains the score as expected.

A $\text{\LaTeX}$ document with a Lilypond score embedded in it.



After the score.

Figure 1: *The output of C.lytex having been preprocessed and compiled.*

Using ‘Include’ Files

I find it easier to manage if I put my Lilypond source code in separate files, this may be achieved using:

```
\lilypondfile[<options>]{<filename>}
```

The above simple example can be rewritten by:

1. Copying C.lytex to C_Include.lytex;
2. Putting the Lilypond part of the document in a separate file, C_Include.ly;

```
1 c4
```

Listing 3: *A (very) simple Lilypond score.*

3. Linking the file C_Include.ly file in the main C_Include.lytex document;

```
1 \documentclass[a4paper,12pt]{scrartcl}
2
3 \begin{document}
4
5 A \LaTeX\ document with a Lilypond score embedded in it.
6
7 \lilypondfile[fragment,relative]{C_Include.ly}
8
9 After the score.
10
11 \end{document}
```

Listing 4: *A simple $\text{\LaTeX}$ document with an external Lilypond score.*

4. Compiling the main document in the same way as above (with the file names changed appropriately).

This produces exactly the same results as above.



3 Copyright

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