examtex documentation

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1 Overview

examtex is a tool for building pretty-looking exams from a simple markup file. This is done by converting the markup file into a LaTeX (file extension .tex) document. This requires Python 3. Then, the tex needs to be compiled into a pdf; this requires an installation of TeX. An alternative would be to input the tex file into an online service such as Overleaf, and have them create the pdf. For those using bash, this tool also provides a bash script which is capable of automatically generating both the tex and the pdf (given a working installation of both Python 3 and `latexmk`).

The first step of the compilation process can easily be done from the terminal using

```
python3 examtex.py MyExam.exam
```

where `MyExam.exam` is the markup file you wrote. This command will run the program `examtex.py`, which generates two files: the .tex file for the exam, and the .tex file for the answer key. In the second step of the compilation process, both .tex files can be compiled into pdfs using any TeX distribution (typically using the program `latexmk`). Or, as mentioned before, you could use an online service.

For those using bash/Linux, I've written the bash script `examtex` which can do both compilation steps at once:

```
examtex [-p][-c] MyExam.exam
```

You will need to have `latexmk` and Perl installed (you should be fine if you've installed any TeX distribution). The bash script takes optional flags: `-p` will convert the tex to pdf, and `-c` will both convert the tex to pdf and clean up the auxiliary files after the pdfs have been created.

2 Making .exam markup files

The markup file uses a simple hierarchical syntax for defining parts of an exam. At the top level, there are sections. These define different sections of the exam, mainly for semantic purposes. Sections are made up of modules, which functionally define parts of the exam (a module for the section title,

a module for a true/false section, a module for instructions, etc.). Finally, within modules we have bangs: short commands which set options or insert a small item which doesn't necessarily require its own module.

Sections and modules are both declared using the same syntax: `[keyword]`, where *keyword* is the type of section or module you want to have. Bangs are preceded by an exclamation mark, and may contain arguments contained in curly braces: `!bang {arg1, arg2}`.

Unlike the three varieties of sections, there are many more types of modules; some of them are special to the Header and Cover section, some can only be used in the Section sections, while others can be used in any type of section. They will be discussed in detail later.

Bangs are preceded by an exclamation mark, and may contain arguments contained in curly braces: `!bang {arg1, arg2}`.

2.1 Sections

There are three types of sections: Header, Cover, and Section. The Header and Cover are special sections; there can be at most one of each, and they must be at the beginning of the exam. On the other hand, Section is the general-purpose section, and acts as a semantic marker between parts of the exam.

2.1.1 Header

The Header section acts as a sort of metadata section. If you include a header, it must be the first section you define. Here, you can define which LaTeX packages to import using the `!pkg` bang. In addition, you can specify three text items to put in a header above each page (left, center, and right). To leave one of them empty, just leave a double-slash in that line.

```
[Header]
!pkg {physics, hyperref}
//
Exam title
Student ID
```

2.1.2 Cover

This defines the cover page for the exam. If you include a cover page, it must be the first section you define (other than the header, which takes precedence). The only valid modules to use in the cover page are: Title, Subtitle, Author, Info, Text, Latex, and Table. All the bangs are valid to use inside the Cover section (although some of them may do nothing). More details can be found later in this document.

2.1.3 Section

This marks general sections within the exam. It's important to have at least one Section to mark the end of the Header or Cover and the beginning of the exam. The only valid modules to use are: Title, Text, Latex, Table, Match, TF, MC, and FRQ. All bangs are valid. More details can be found later in this document.

2.2 Modules

There are 11 types of modules. 4 of them (Title, Text, Latex, Table) can be in any section; 3 of them (Subtitle, Author, Info) can be used only in the Cover; and the other 4 (Match, TF, MC, and FRQ) represent question types and can only be used in the actual body of the exam.

Declaring a module uses the same syntax as declaring a section: `[Module]`. After this line, all the content underneath belongs to this module, until the next module or section declaration. Different modules have syntaxes, which are described below.

2.2.1 Title

Takes a single line of text and makes it big. On the Cover, it makes the title of the exam, whereas in a section, it is typically used to label the section.

```
[Title]
Part II: Interpreting Data
```

2.2.2 Text

Make paragraphs of text. Useful for writing instructions on the cover page or for a section. Use `i{stuff}` and `\b{stuff}` for italics and bold. Simple LaTeX can be interpreted, such as the `noindent` command, as well as math mode.

```
[Text]
Lorem Ipsum.  \b{bold text} and math $y=e^{e^t}$.  First
paragraph unindented as per \LaTeX convention.
Here's a new paragraph, automatically indented.
```

2.2.3 Latex

Directly insert LaTeX into the document.

```
[Latex]
\\[.2 in]
\par
\begin{itemize}
\item item 1
\item item 2
\end{itemize}
```

2.2.4 Table

Simple table formatting. Use tabs to separate items in each row; newline to separate rows. Use a line of just dashes to insert a horizontal line. Use `\i{stuff}` and `\b{stuff}` for italics and bold.

The *options* bang is required for Table, and it must contain the *pattern* option. The pattern uses the syntax of tabular, the LaTeX package, to specify the number of columns, the positions of column separators, and the text alignment in each column. Refer to the tabular documentation for more details. Other potential options for table formatting are the *boxed* flag (which frames the table), and *linespace* (which specifies the spacing between rows).

```
[Table]
!options {pattern=c|c, linespace=1.25, boxed}

\b{Age}     \b{Height}
----------------
11     5'2"
13     5'3"
14     5'6"
16     5'8"
18     5'9"
```

2.2.5 Subtitle

A subtitle for the cover page.

```
[Title]
Introduction to Topology
[Subtitle]
Midterm 2
```

2.2.6 Author

Specifies the author(s) of the exam, along with potential contact information, separated by a comma. Cover page only. The name is bolded and the contact information is italicized.

```
[Author]
Dhruva Karkada, dkarkada@gmail.com
Another Author, contact@gmail.com
```

2.2.7 Info

Provides a place on the Cover for the student to write his information. Each line represents a labelled blank line for the student to fill out.

```
[Info]
Student Name
Date
Any other info
```