TKES — LaTeX

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Building LaTeX documents

latexmk — a build tool for LaTeX

Typical compilation procedure for glossaries_and_biblatex_example.tex:

```
target=glossaries_and_biblatex_example
pdflatex $target.tex &&\   # first run creates auxiliary files
biber $target &&\          # programs process auxiliary files
makeglossaries $target &&\ # e.g., for bibliography or glossaries
pdflatex $target.tex &&\   # second, third, ...  run processes
pdflatex $target.tex       # output of external programs
```

- many packages work with external programs (biblatex, gloassaries, …)
- number of runs depends on the \documentclass and the \usepackage's
- latexmk automatically decides what programs to run

latexmk — an example

```
# synopsis
latexmk [OPTIONS] [FILE ...]

# example
latexmk -pdf glossaries_and_biblatex_example.tex
```

- -pdf to produce a PDF file
- -pvc to continuously watch all changes source files
- -c to delete all auxiliary files

latexmk — configuration

- latexmk can be configured with a perl script
- placeholders

%S	source file of compilation
%R	basename of the %S or value of -jobname
%...	...many more

.latexmkrc

```
$pdf_mode = 4;  # use the `$lualatex` command to generate pdfs
$lualatex = 'lualatex --shell-escape -interaction=batchmode %O %S';

@default_files = ('main.tex', '*_example.tex');

$clean_ext = 'fls snm nav bbl bcf run tdo fdb_latexmk auxlock';
$clean_ext .= ' ' . '_minted-%R/* _minted-%R'; # aux files of minted
```

debugging tex files — warnings

- `\documentclass[draft]{...}`
- `\usepackage{showframe}`
- `\usepackage[babel, final]{microtype}`
- see `debugging_example.tex`

chktex — a linter for LaTeX

> “Lint, or a linter, is a static code analysis tool used to flag programming errors, bugs, stylistic errors and suspicious constructs.”
>
> — Wikipedia: Lint (software)

- available for almost all major programming languages
- `chktex` can be used for LaTeX
- many IDEs easily integrate installed linters
- greatly enhance the learning-by-doing approach

chktex — an example

```
# synopsis
chktex [OPTIONS] FILE1 FILE2 ...


# example
chktex -v0 chktex_example.tex
```

- proper parenthesis matching
- proper usage of ellipsis commands
- proper spacing for references and abbreviations
- ...
- disable warning <N> in a line with: `% chktex <N>`
- disable warning <N> in a file with: `% chktex-file <N>`

Using `--shell-escape`

What is `--shell-escape`

- option passed to a tex compiler (`pdflatex`, `lualatex`, ...) or `latexmk`
- allows to run external programs from within the tex compiler
- three examples here
  - `minted`
  - `pythontex`
  - `external` option of `pgfplots`
- see `.latexmkrc` for an automatic setups

minted — beautiful syntax highlighting

minted_example.tex

```latex
\documentclass{beamer}

\usepackage{minted}

\begin{document}
\begin{frame}[fragile]
    \inputminted[%
        label=minted\_example.tex,%
        frame=single,%
    ]{latex}{minted_example.tex}
\end{frame}
\end{document}
```

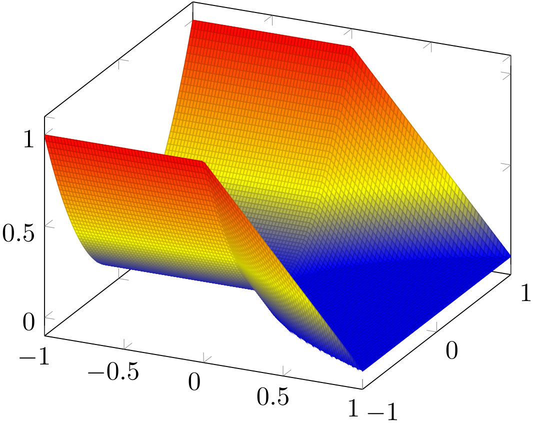
...this is funny

`pythontex` — correct assignment solutions

- `pythontex` runs arbitrary python code with `\py{...}`
- redirects `stdout` to the `.tex` file
- example: `Did you know that \(6 + 3*12 = \py{6 + 3*12}\)?`
  yields: “Did you know that $6 + 3 * 12 = 42$?”
- see `pythontex_example.tex` for a more interesting example

tikz-externalize — generate images only once

- \tikzexternalize to enable
- name externalfiles with \tikzsetnextfilename
- externalized images are shared if named
- see externalize_example.tex



1
0.5
0
−1
−0.5
0
0.5
1
−1
0
1