A Memo About Memos

Alejandro Revilla (@apr)

2024-07-24

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A Memo About Memos

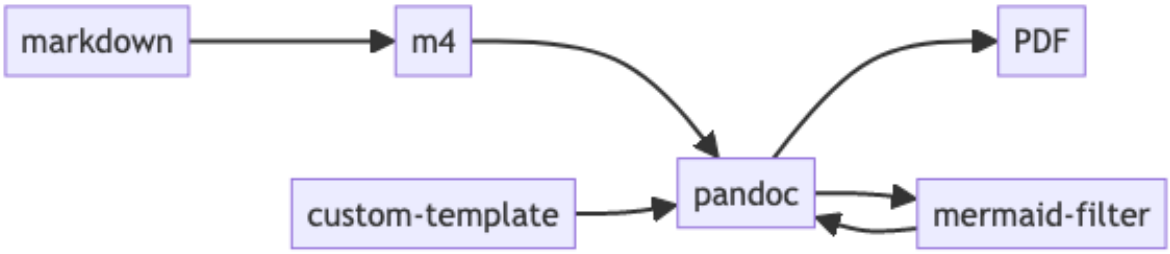
I am such a weak writer that I can't afford to add bad typography on top of my already flawed writing. I'm so challenged when it comes to aesthetics that, whenever I use a WYSIWYG editor—and I've used many since the early PageMaker days—I spend more time figuring out fonts and paragraph alignment than actually writing. Because I occasionally get to read beautifully typeset documents—and terrible ones most of the time—I can tell the difference and appreciate subtle details such as appropriate hyphenation, justification, kerning, leading, and the use of ligatures.

I write a lot of memos for different audiences, including technical, executive, internal, customer proposals, design analysis, and more. Over the years, I have used various tools to write these memos, such as YODL [1], TEX[2], LATEX[3], DocBook [4], DITA [5], AsciiDoc [6], AsciiDoctor [7], and of course, Markdown[1]. After decades of peregrination through different toolchains and editors, including high-end XML editors, nothing beats `vi` (or `emacs` if that's your religion) for fast editing, `Markdown` for ease of use, and LATEX for perfect typesetting.

While the awesome `pandoc` is the easiest way to convert `Markdown` to a properly typeset `PDF`, the default output, though better than that of many other Markdown editors, is great for occasional memos but doesn't look professional. I've been trying to write a nice `pandoc` template myself without much success, but I recently came across a beautiful one: Eisvogel.[2]

> This document could end right here: write Markdown and use 'pandoc' with the 'Eisvogel' template to produce beautiful documents. Period.

However, I believe I can contribute a small addition to the toolchain that will enhance your writing experience and content reuse.



[1] Disregard the bibliographic references and bookmarks like this; I'm adding them just to show how they look.

[2] https://github.com/Wandmalfarbe/pandoc-latex-template

Required tools

TexLive

TEXLive is a comprehensive distribution of the TEX typesetting system, offering a wide range of TEX-related software, packages, fonts, and utilities. Maintained by the TEX Users Group, it supports multiple operating systems, including Linux, macOS, and Windows. The live distribution can be found at: https://www.tug.org/texlive/

Pandoc

Pandoc is a powerful document converter that supports over a dozen input formats and more than thirty output formats, including Markdown, HTML, LATEX, PDF, and Word, making it a perfect fit for our memo toolchain and can be found at https://pandoc.org/

Mermaid-filter

Mermaid is a versatile tool for creating diagrams and charts from simple text descriptions. It generates flowcharts, sequence diagrams, Gantt charts, and more using an easy-to-learn syntax. Popular in technical documentation and project management, Mermaid integrates seamlessly with various platforms, enhancing documents with clear and visually appealing diagrams. We need the `mermaid-filter` package that gets called from `pandoc`, and can be installed with the command:

```
npm i -g mermaid-filter
```

M4

The `m4` macro processor, designed by Brian Kernighan and Dennis Ritchie and originally developed as part of the Unix operating system in the 1970s, is not technically required in this toolchain but is a perfect fit for splitting large documents into smaller pieces, reusing content snippets, and providing standard constants such as the Git revision of the document, date, time, filename, and more. Key features of `m4` include its ability to define macros, perform arithmetic operations, manipulate text with ease, and call the operating system[3]. It also supports file inclusion, conditional statements, and looping constructs.

As an example, to show the revision of the document, you can insert `__REVISION__`, which will be expanded in this case to "748a83f". The same goes for other variables such as `__DATE__`, `__TIME__`, `__FILENAME__`, `__BRANCH__` and others that you may want to add to the `memo`

[3] This poses a security risk when using third-party Markdown sources.

script. If you're on Unix, `m4` is probably installed, verify that with the command `type m4`. On Windows, you can install it using Cygwin, or the Windows Subsystem for Linux (WSL).

Pandoc template

The Eisvogel template, located at https://github.com/Wandmalfarbe/pandoc-latex-template, has a fantastic set of examples and provides detailed instructions on how to install it. On macOS, with `pandoc` installed via `brew`, the location is `$HOME/.local/share/pandoc/templates` under the name `custom_eisvogel.latex`. It can, of course, be the pristine `eisvogel.latex` script. I suggest calling it `custom_eisvogel.latex` in case you want to add some additional LaTeX commands or configuration.

In that `pandoc/templates` directory, you may also want to add `ieee-with-url.csl` from https://github.com/citation-style-language/styles/blob/master/ieee-with-url.csl or another citation style of your choice.

The memo script

```
#!/bin/bash

# Requires npm i -g mermaid-filter and TeXLive

set -e

# print usage
usage() {
    echo "Usage: $(basename $0) [-DNAME=VALUE ...] your-markdown-file.md [single|double]"
    exit 1
}

# initialize Git branch and revision
init_git_info() {
    BRANCH="unknown"
    REVISION="unknown"

    if git rev-parse --is-inside-work-tree > /dev/null 2>&1; then
        if git rev-parse HEAD > /dev/null 2>&1; then
            BRANCH=$(git rev-parse --abbrev-ref HEAD)
            REVISION=$(git rev-parse --short=7 HEAD)
            if ! git diff-index --quiet HEAD --; then
                REVISION="${REVISION}*"
            fi
        else
            BRANCH="empty"
            REVISION="empty"
        fi
```

```
    fi
}

# parse layout option
parse_layout_option() {
    if [ "$1" = "single" ]; then
        LAYOUT_OPTION=""
    elif [ "$1" = "double" ]; then
        LAYOUT_OPTION="--variable classoption=twocolumn"
    else
        echo "Invalid layout option. Use 'single' or 'double'."
        exit 1
    fi
}

# Check for minimum number of arguments
if [ $# -lt 1 ]; then
    usage
fi

# Initialize variables for m4 -D parameters
TS=$(date "+%Y-%m-%d %H:%M" | awk '{ printf "%s", $0 }')
D=$(echo "$TS" | cut -d ' ' -f 1)
T=$(echo "$TS" | cut -d ' ' -f 2)

# Initialize Git branch and revision
init_git_info

# Initialize m4 parameters
M4_PARAMS="-D__DATE__=$D -D__TIME__=$T -D__BRANCH__=\"$BRANCH\" -
    D__REVISION__=\"$REVISION\""
PANDOC_TEMPLATES_DIR="$HOME/.local/share/pandoc/templates"

# Parse -D parameters and Markdown file
while [ $# -gt 0 ]; do
    case "$1" in
        -D*)
            M4_PARAMS="$M4_PARAMS $1"
            shift
            ;;
        *.md)
            MD=$1
            shift
            break
            ;;
        *)
            usage
            ;;
    esac
done

# Check if a Markdown file was provided
if [ -z "$MD" ]; then
```

```
    usage
fi

# Parse layout option
LAYOUT=${1:-single}
parse_layout_option "$LAYOUT"

DIR=$(dirname "$MD")
BASENAME=$(basename "$MD" .md)
PDF="$DIR/${BASENAME}.pdf"
BIB="$DIR/${BASENAME}.bib"
PREPROCESSED_MD="${BASENAME}_preprocessed.md"
ERROR_FILE="mermaid-filter.err"
M4_PARAMS="$M4_PARAMS -D__FILENAME__=$MD"

# Preprocess the Markdown file with m4
{
    echo ""
    echo ""
    cat "$MD"
} | m4 $M4_PARAMS - > "$PREPROCESSED_MD"

# Use -t latex -o $MD.tex to get LaTeX output instead of PDF
if [ -f "$BIB" ]; then
    if [ -z "$BIB_OPTION" ]; then
        BIB_OPTION="--bibliography=$BIB"
    else
        BIB_OPTION="$BIB_OPTION --bibliography=$BIB"
    fi
    BIB_OPTION="$BIB_OPTION --citeproc"
fi

cd "$DIR" && pandoc --pdf-engine=xelatex \
    --from markdown \
    --variable papersize=a4 \
    --template=custom_eisvogel --listings \
    --csl=$PANDOC_TEMPLATES_DIR/ieee-with-url.csl \
    -F mermaid-filter \
    $LAYOUT_OPTION \
    $BIB_OPTION \
    -s "$PREPROCESSED_MD" -o "$PDF"

# Clean up the preprocessed file
if [ -f "$PREPROCESSED_MD" ]; then
    rm "$PREPROCESSED_MD"
fi

# Clean up mermaid's error file if it's empty
if [ -f "$ERROR_FILE" ] && [ ! -s "$ERROR_FILE" ]; then
    rm "$ERROR_FILE"
fi

echo "PDF generated at $PDF"
```

```
open "$PDF"
```

Frontmatter

This is a sample frontmatter for this document:

```
---
title: A Memo About Memos
subject: Memo Typesetting
author: Alejandro Revilla (\@apr)
date: 2024-07-24
keywords: [Typography]
titlepage: true
# titlepage-logo: jpos.jpg
lang: "en"
toc: true
toc-own-page: true
footer-center: jPOS.org
titlepage-rule-color: "360049"
titlepage-text-color: "FFFFFF"
titlepage-rule-color: "360049"
titlepage-rule-height: 0
titlepage-background: "../backgrounds/background.pdf"
footnotes-pretty: true
header-includes:
  - \usepackage{multicol}
  - \usepackage{mdframed}
  - \usepackage{graphicx}
  - \usepackage{xcolor}
  - \usepackage{pgfplots}
  - \usepackage{amsmath}
  - \pgfplotsset{compat=1.17}
---
```

Note that some of the added packages are used in my custom template, just as a PoC of different features. You can safely remove that `header-includes` section.

Bibliography

You can add `.bib` file, with the same name as your main `.md` file with the following format:

```
@article{kubat1997yodl,
  title = {YODL or Yet Oneother Document Language},
  author = {Kubat, Karel},
  journal = {Linux Journal},
  year = {1997},
  month = {November},
  number = {2089},
  url = {https://www.linuxjournal.com/article/2089}
```

```
}

@manual{docbook,
  title = {DocBook 5.0: The Transition Guide},
  author = {{OASIS DocBook Technical Committee}},
  year = {2010},
  note = {Available online at \url{https://www.docbook.org/tdg5/en/html/docbook.html}},
  url = {https://www.docbook.org/tdg5/en/html/docbook.html}
}

@manual{dita,
  title = {DITA 1.3 Specification},
  author = {{OASIS DITA Technical Committee}},
  year = {2015},
  note = {Available online at \url{https://docs.oasis-open.org/dita/dita/v1.3/os/}},
  url = {https://docs.oasis-open.org/dita/dita/v1.3/os/}
}
...
...
```

References

[1] K. Kubat, “YODL or yet oneother document language,” *Linux Journal*, no. 2089, 1997, Available: https://www.linuxjournal.com/article/2089

[2] D. E. Knuth, *The TeXbook*. in Computers & typesetting, volume a. Reading, Massachusetts: Addison-Wesley, 1984.

[3] L. Lamport, *LaTeX: A document preparation system*, 2nd ed. Reading, Massachusetts: Addison-Wesley, 1994.

[4] OASIS DocBook Technical Committee, *DocBook 5.0: The transition guide*. 2010. Available: https://www.docbook.org/tdg5/en/html/docbook.html

[5] OASIS DITA Technical Committee, *DITA 1.3 specification*. 2015. Available: https://docs.oasis-open.org/dita/dita/v1.3/os/

[6] E. Stuart, *AsciiDoc user guide*. 2002. Available: http://www.methods.co.nz/asciidoc/

[7] D. Allen, *Asciidoctor documentation*. 2021. Available: https://asciidoctor.org/docs/