Markdown 3
What's new, what's next?

Vít Starý Novotný
TUG 2023, Bonn
15 July, 2023
# Introduction

- TeX is moderately easy to write, but difficult to read and think about:
- Markdown is a lightweight markup language that is easy to both read & write:

# First Level Header

## Second Level Header

Now is the time for *all* good men to come to the aid of their country.

## Why do authors care?

It is strangely difficult to get people to see the point, but the defects of LaTeX for concentration, writing and thought, are at least as great as those of Word, for the simple reason that it gives the writer too much power; there is always another package to call in the preamble, as there is always another drop down menu in Word. [...

In markdown – not to put too fine a point on it – the writer is only ever faced with one question, and it is the right one: what the next sentence should be.

*(Thompson, 2010)*
Introduction

Why do TeXperts care?

- All markdown elements can be formatted using TeX macros [1].

\markdownRendererHeadingOne{First Level Header}
\markdownRendererHeadingTwo{Second Level Header}
\markdownRendererInterblockSeparator
Now is the time for \markdownRendererEmphasis{all} good men to come to the aid of their country.

- Publishers may hire TeXperts to prepare markdown support for TeX templates.
- Various TeX formats are supported: Plain TeX, LaTeX, ConTeXt, …

Introduction

Why do developers care?

- Heterogeneous code base in more than six different programming languages.
- Participate in development and governance of an open-source project.
- Opportunities for research and development grant projects.
- Publishers may hire developers to add new markdown elements [2]:

```markdown
# First Level Header
## Second Level Header

Now is the time for \#no\#*all* good men to come to the aid of their country.

Contents

1. What’s new?
   a. CommonMark
   b. Syntax extensions
   c. New TeX formats
   d. External bindings
   e. Independent packages
   f. Social platforms, governance

2. What’s next?
   a. Roadmap to 3.0.0
      i. Open issues
      ii. New features
      iii. Deprecated features
   b. Past 3.0.0
What’s new?  

- The original specification of the markdown language is ambiguous:

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
<th>Expected?</th>
</tr>
</thead>
<tbody>
<tr>
<td>- first</td>
<td>first</td>
<td>first</td>
</tr>
<tr>
<td>1. second?</td>
<td>second?</td>
<td>1. second?</td>
</tr>
<tr>
<td><em>a <em>b</em> c</em></td>
<td>a <em>b c</em></td>
<td>a b c</td>
</tr>
</tbody>
</table>

- To improve interoperability, the CommonMark standard was introduced.

[3]: A. Genčur. An implementation of the CommonMark standard into the Markdown package for TeX. 2023. Masaryk University. Available at WWW: [https://is.muni.cz/th/r7z7l/?lang=en](https://is.muni.cz/th/r7z7l/?lang=en)
What’s new? Syntax extensions: Metadata

- What markdown is to document text, YAML is to document metadata:

  title: "Markdown 3: What's new, what's next?"
  authors: [Vít Starý Novotný]
  year: 2023

- Authors can type both YAML and markdown in a single file.
- TeXperts can specify the formatting of different YAML keys [4, 2].

What’s new?  Syntax extensions: Attributes

- Authors can add information by attaching attributes to markdown elements:

The package mwe by [Martin Scharrer]{.index} provides images for creating minimal working examples ([MWE]{.abbr}s), see Figure `<#example>`:

![example](example-image){#example width=3cm height=2cm}

- TeXperts can specify the formatting of attributes [5].

What’s new? Syntax extensions: Hybrid markup I

- Authors could always freely mix TeX & markdown at the cost of interoperability.
- Authors can now denote TeX blocks and spans in markdown:

```markdown
$H_2O$\{=tex\}
```

```latex
\begin{tikzpicture}
  \draw (0,0) -- ({sqrt(3)},1); \draw (0,0) -- ({sqrt(3)},-1);
  \draw[fill=red] (0,0) circle (1cm);
  \draw[fill=white] ({sqrt(3)},1) circle (0.6cm);
  \draw[fill=white] ({sqrt(3)},-1) circle (0.6cm);
\end{tikzpicture}
```
Authors can also move TeX code to external files and include them in markdown:

✓ /tikz-h2o.tex (A water molecule)

Furthermore, authors can type math between pairs of delimiters:

$H_2 O$ is water and $\lim_{x \to \infty} \exp(-x) = 0$. 

All these options are more interoperable than just mixing TeX with markdown.
What’s new?

Here are some other markdown elements authors can use [2, 4]:

- Task lists:
  - [x] Draft title.
  - [.] Draft outline.
  - [ ] Copy edit.

- Emphatic line breaks:
  Memory and desire, stirring
  Dull roots with spring rain.

Syntax extensions: Other

- Subscripts and superscripts:
  $2^{10}$ is 1024.
  $\text{H}_{2}\text{O}$ is water.

- Strike-through:
  Under his pillow P'raps found
  ~~A cake that weighed a half a pound.~~
  A plenty of space to roll around.

What’s new?

New TeX formats

● TeXperts could always use Plain TeX, LaTeX, and ConTeXt.
● TeXperts can now use new TeX formats to typeset markdown documents:
  ○ TeX4ht produces websites instead of PDF documents.
  ○ OPTeX is a minimalistic TeX format based on Plain TeX.
  ○ To typeset the TeX4ht example, run `make4ht latex-tex4ht.tex fn-in`.
  ○ To typeset the OPTeX example, run `optex optex.tex`.
What’s new?

- Pandoc can typeset many document formats with limited formatting options.
- Markdown package can typeset just markdown with many formatting options.
- Undergraduate thesis [4, 6] allows TeXperts to combine strengths of both tools:

\documentclass{article}
\usepackage{pandoc-to-markdown, emoji}
\markdownSetup{renderers = {
  headingOne = \section*{emoji\{wolf\}#1}}}
\begin{document}
\pandocInput[format=man]{wolf.1}

NAME
wolf - tool for befriending grandmas

SYNOPSIS
wolf [-b|--befriend] [-s|--scare] <grandma>


External bindings: Pandoc
What’s new?  

- Developers can use tinyyaml package to parse YAML anywhere:

```lua
local tinyyaml = require("tinyyaml")
local text = "authors: [Vít Starý Novotný]"
local data = tinyyaml.parse(text, {timestamps=false})
print(data.authors[1])
```

- TeXperts can use lt3luabridge package to execute Lua in non-LuaTeX engines:

```latex
\documentclass{standalone}
\usepackage{lt3luabridge}
\begin{document}
$1 + 2 = \luabridgeExecute{print(1 + 2)}$
\end{document}
```
What’s new?

Social platforms, governance

- Previously, developers could discuss at https://github.com/witiko/markdown.
- Now, authors, TeXpers, and developers can join instant messaging platforms:
  - Discord: https://discord.gg/8xJsPghzSH
  - Matrix.org: https://matrix.to/#/#witiko-markdown:matrix.org
What's next? Roadmap to 3.0.0: Open issues

- The implementation of CommonMark contains a memory leak, see issue 308.
- Too many unit tests are timing out continuous integration, see issue 245.
- Our attributes are not fully compatible with other implementations, see issue 304.
What’s next?  

Roadmap to 3.0.0: New features I

- Authors will be able to reference not just figures but also tables, see issue 310:

See Table `<#example>`.

<table>
<thead>
<tr>
<th>Right</th>
<th>Left</th>
<th>Default</th>
<th>Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>------:</td>
<td>:-----</td>
<td>---------</td>
<td>:------:</td>
</tr>
<tr>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>123</td>
<td>123</td>
<td>123</td>
<td>123</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

: Example table `{#example}`
What’s next?

Roadmap to 3.0.0: New features II

- In markdown, authors can’t type block elements such as lists in a paragraph.
- In TeX, authors can typeset lists in a paragraph:

Both
\begin{itemize}
\item apples and
\item oranges
\end{itemize}
are fruits.

- Authors will be able to end a markdown paragraph with blank lines, see issue 30.
What’s next? Roadmap to 3.0.0: Deprecations

- Markdown 3 introduces a number of breaking changes for TeXperts:
  - An option to typeset all line breaks was replaced by soft line break element.
  - Footnotes were renamed to notes, horizontal rules to thematic breaks.
  - Heading attributes now span just headings, not sections implied by headings.
- Here are some options available to publishers with templates for Markdown 2:
  - Use TeX Live 2023 or earlier.
  - Distribute your template together with Markdown 2 and use current TeX Live.
  - Ask a TeXpert to update your template.
What’s next?  

Past 3.0.0: Syntax extensions

- Authors will be able to reference sections using implicit identifiers:

  We list previous work in Section `#previous-work`.

# Previous work
We previously worked on the previous sections.
Now, we are hard at work on this one.

- See issues 237 and 238.
What’s next?

- TeXperts will be able to control whether authors can use inline / block elements:
  \markdownInput[contentLevel=inline]{footer-text.md}

- Authors will be able to sprinkle inline markdown code in TeX documents:
  Now is the time for \markinline{*all*} good men to come to the aid of their country.

- See issue 300.
What’s next?  

Past 3.0.0: TeX formats & bindings

- OPTeX example contains support code, which will be a module, see issue 215.
- Pandoc-to-Markdown is a proof-of-concept, should become part of Pandoc.

Past 3.0.0: Formatting defaults

- Without a template, authors use default formatting, which is often insufficient.
- Default formatting will be separate package to allow a serious implementation.
What’s next?

Past 3.0.0: Mailing lists, governance

- A mailing list should be added for long-form discussions about the package.
- Future growth of the package will require more decentralized governance.
Conclusion

● Authors, TeXperts, and developers can all look forward to Markdown 3.
● Questions?