Org-mode Latex Export Example

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1 Version information

```
Emacs version: GNU Emacs 25.1.50.3 (x86_64-unknown-linux-gnu, GTK+ Version 3.10.8)
 of 2016-02-13
org version: 8.3.3
```

2 Major document elements

2.1 Equations

- Nice link for mathematical symbols on wikipedia:

This is an example for an equation
$cores_{extrapol} = cores_{intern2013} \cdot offl\% \cdot \frac{gf \cdot (volume_{user} + volume_{intern})}{volume_{intern}}$

This is an example for an equation embedded in the text $cores_{extrapol} = cores_{intern2013} \cdot offl\% \cdot \frac{gf \cdot (volume_{user} + volume_{intern})}{volume_{intern}}$ The text continues after the formula.

Here follows a numbered equation that also can be referenced like in the following parentheses (eq 1). Note that we have to rely here on standard latex syntax, since org mode does not offer equations as a native element that we can mark up with #+NAME tags, etc.

$$cores_{extrapol} = cores_{intern2013} \cdot offl\% \cdot \frac{gf \cdot (volume_{user} + volume_{intern})}{volume_{intern}} \quad (1)$$

from an article by Stefaan Lippens on on using *textnormal* for including normal text correctly in a math environment.

$$\int_1^9 xdx \qquad \text{this is textrm}$$

$$\sum_1^9 y \qquad \textsf{this is textsf}$$

$$\prod_1^9 z \qquad \text{this is textnormal}$$

Only textnormal will guarantee that the text appears in the default font of the document.

2.2 Figures

I can reference the figure like this: Fig. 1.

Note

- there must be no empty line between the picture's link and the meta definitions for name, caption, etc.
- The figure must have a caption.
- The OPTION `tex:t` must be set for references to work.

Specifier	Permission
h	Place the float here, i.e., approximately at the same point it occurs in the source text (however, not exactly at the spot)
t	Position at the top of the page.
b	Position at the bottom of the page.
p	Put on a special page for floats only.
!	Override internal parameters LaTeX uses for determining "good" float positions.
H	Places the float at precisely the location in the LaTeX code. Requires the float package, e.g., float. This is somewhat equivalent to h!.

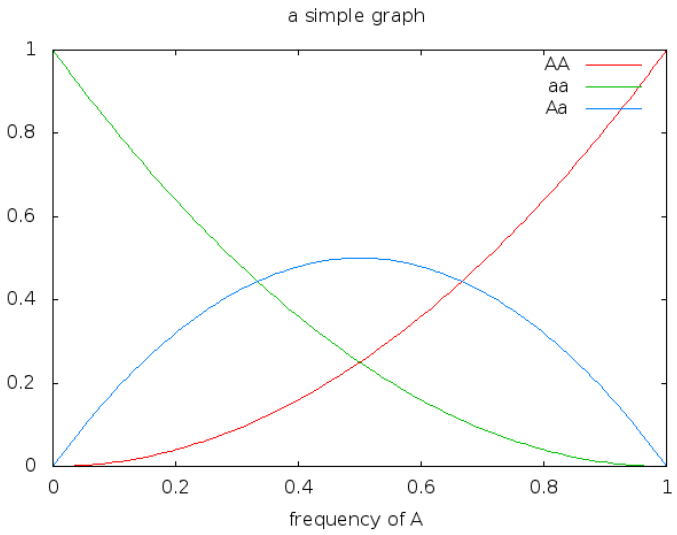

Figure 1: A simple graph

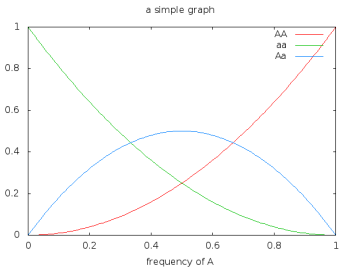

Figure 2: A simple graph at half the width

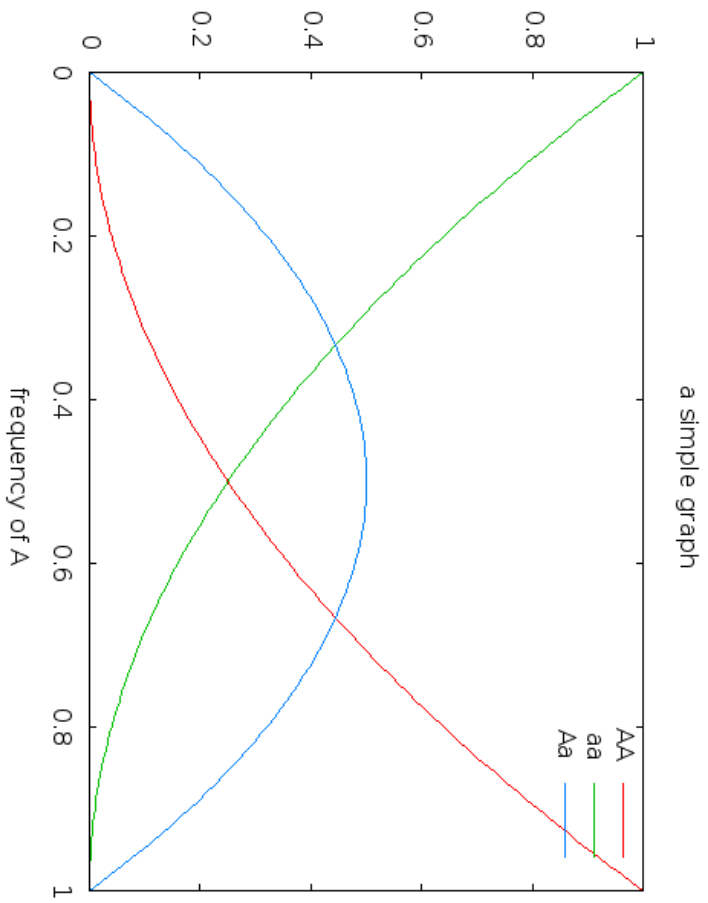

Figure 3: A simple graph rotated 270°

A pdf can be included the same way, e.g. by specifying

```
#+ATTR_LATEX: :options page=10 :width 10cm
[[file:myfig.pdf]]
```

2.2.1 inclusion of SVG graphics

q.v. my plantuml related documentation.

2.3 Tables

2.3.1 nicer table formatting using booktab style

Some interesting tips for booktab style tables by M. Püschel.

Booktabs can be turned on by default for all tables by setting this variable for the document or globally:

```
org-latex-tables-booktabs: t
```

Whether table captions appear above or below the table can be configured using this variable setting:

```
org-latex-table-caption-above: nil
```

Table 1: default table

Column 1	Column 2	Column 3	Column 4
1	10	100	1000
2	11	101	1001
3	12	102	1002
4	13	103	1003
5	14	104	1004
15	60	510	5010

Table 2: table using booktabs style

Column 1	Column 2	Column 3	Column 4
1	10	100	1000
2	11	101	1001
3	12	102	1002
4	13	103	1003
5	14	104	1004
15	60	510	5010

2.3.2 Math in tables

Use *math* or *inline math* together with *array* environment.

Here we use the simple math mode

$Column1$	$Column2$
$\sin(x)$	$\tan(x)$

This uses the `inline-math` mode | $Column1$ | $Column2$ |
|---|---|
| $\sin(x)$ | $\tan(x)$ |

2.3.3 Table font size

The font size is determined by the `:font` switch in the `#+ATTR_LATEX` line.

Column 1	Column 2
Some text	Some other text
10	20

Sidenote:

- When a caption is used, the latex export uses a `table` environment.
- The previous captionless table generates a `tabular` environment.

Table 3: Table small size

Column 1	Column 2
Some text	Some other text
10	20

Table 4: Table footnotesize

Column 1	Column 2
Some text	Some other text
10	20

Table 5: Table tiny size

Column 1	Column 2
Some text	Some other text
10	20

2.3.4 Sidewaystable

Using the sidewaystable together with a `:placement [H]` specifier requires that one uses the `rotfloat` environment.

Table 6: A sidewaystable

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
1	10	100	1000	example	result
2	11	101	1001	example	result
3	12	102	1002	example	result
4	13	103	1003	example	result
5	14	104	1004	example	result
6	15	105	1005	example	result
7	16	106	1006	example	result

This text comes after the sidewaystable (we want to check whether the placement modifier was observed).

Even though in the info documentation it reads: "Note: :placement is ignored for :float sideways tables.", the modifier `[H]` is observed, as can be confirmed in the resulting PDF.

2.3.5 Table references

These are references to table 1 and table 2.

3 Text features

3.1 Text font size

Text Example Text Example Text Example Text Example Text Example (default) Text Example Text Example Text Example Text Example Text Example (default)

3.2 Footnotes and margin notes

This is a text with a footnote [1]. The footnote will be displayed on the bottom of the current page. One can also place all footnotes in a separate chapter called *footnotes* at the end of the org file[2].

Margin notes one can set by directly inlining the LaTeX command as demonstrated here. By default the margin notes are justified. This often looks awkward. Using this stackexchange answer, I define a macro which yields:

a default margin note

I like the margin notes to be left aligned instead of being justified.

a left aligned margin note that looks nicer

3.3 Figure, table, equation references

Here, we show the usage of links to the text sections:

The References to figures are found in chapter 2.2, references to tables are found in chapter 2.3, and references to equations in chapter 2.1.

4 Links

4.1 Org LaTeX exports

- Subfigures: gmane.emacs.orgmode/92821

4.2 LaTeX links

- Hyperlink formatting
  - This is described in the LaTeX hyperref manual.
  - This is an example how to get links that are not framed by red rectangles, but just have a blue font color

[1] This is the footnote text

[2] this is a footnote from the end of the org document

```
#+LaTeX_HEADER: \hypersetup{colorlinks=true, linkcolor=blue}
```

- Building a LaTeX Document Class
  - http://tutex.tug.org/pracjourn/2005-4/hefferon/hefferon.pdf

5 Index creation

Must be solved by including LaTeX source commands:

- Requires in the preamble
  - `\usepackage{makeidx}`
  - `\makeindex`
- Mark up words by `\index{word}`
- At the location where the index should apear, use `\printindex`
- to render the document, a call to the `makeindex` binary needs to be added in the build command. I use the following definition in my `init.el`.

```
(setq org-latex-pdf-process
      (let
          ((cmd (concat "pdflatex -shell-escape -interaction nonstopmode"
                        " -output-directory %o %f")))
        (list cmd
              "cd %o; if test -r %b.idx; then makeindex %b.idx; fi"
              cmd
              cmd)))
```

6 References

Some important org references that also display that citations directly following each other will be combined [3, 1]. And another single reference [2].

The `#+BIBLIOGRAPHY:` command inserts the reference list at the location where it is placed. It requires the name of the bib-file (without .bib extension) and the name of a style (e.g. plain).

For HTML exports one can also pass options to the `bibtex2html` binary (look at the comments section of `ox-bibtex.el` and also the bibtex2html man page).

Table 7: bibtex2html options

option	functionality
-d	sort by date
-a	sort as BibTeX (usually by author) **default**
-u	unsorted i.e. same order as in .bib file
-r	reverse the sort
-t	limit to entries cited in document

Multiple options can be combined as follows:

`option:-d option:-r`

To get the citations correctly processed rendered, one needs to add a bibtex invocation to the LaTeX command chain:

```
(setq org-latex-pdf-process
      (let
          ((cmd (concat "pdflatex -shell-escape -interaction nonstopmode"
                        " --synctex=1"
                        " -output-directory %o %f")))
        (list cmd
              "cd %o; if test -r %b.idx; then makeindex %b.idx; fi"
              "cd %o; bibtex %b"
              cmd
              cmd)))
```

To just produce a bibliography of all items in the bib file, on can use the following LaTeX snippet. The `\nocite{*}` command includes items that have not been cited in the document; a star matches all documents, so all get included (q.v. this link).

```
#+BEGIN_LATEX
  \documentstyle{amsart}
  \begin{document}
  \nocite{*}
  \bibliographystyle{amsplain}
  \bibliography{bib-filename}
  \end{document}
#+END_LATEX
```

References

[1] Dominik, C. *The Org Mode 7 Reference Manual-Organize your life with GNU Emacs*. Network Theory Ltd., 2010.

[2] Feichtinger, D., and Plattner, D. A. Direct proof for $o = mn^V$ (salen) complexes. *Angewandte Chemie International Edition in English 36*, 16 (1997), 1718–1719.

[3] Schulte, E., Davison, D., Dye, T., and Dominik, C. A multi-language computing environment for literate programming and reproducible research. *Journal of Statistical Software 46*, 3 (2012), 1–24.

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Emacs 25.1.50.3 (Org mode 8.3.3)