Test Article

DE

June 2019

Contents

Abstract

This is a test file for the `LatexTree` package. For more information please visit

`https://github.com/dimbyd/latextree`

1 Introduction

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2 Sections

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2.1 A fancy title: $\alpha + \beta$

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

A section-level heading

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

A subsection-level heading

Quisque ullamcorper placerat ipsum. Cras nibh. Morbi vel justo vitae lacus tincidunt ultrices. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. In hac habitasse platea dictumst. Integer tempus convallis augue. Etiam facilisis. Nunc elementum fermentum wisi. Aenean placerat. Ut imperdiet, enim sed gravida sollicitudin, felis odio placerat quam, ac pulvinar elit purus eget enim. Nunc vitae tortor. Proin tempus nibh sit amet nisl. Vivamus quis tortor vitae risus porta vehicula.

3 Lists

An unordered list:

- Apples
- Oranges
- Lemons

An unordered list with custom markers:

ap Apples

α Oranges

le Lemons

An ordered list:

1. Cars
2. Buses
3. Bikes

Nested enumerate lists

1. Cars
   (a) Ford
   (b) Honda
2. Buses
   (a) Mini
   (b) Coach
3. Bikes
   (a) Road
      i. Racing
      ii. Touring
   (b) Mountain

4 Theorems

Definition 4.1 *This is a definition*

Lemma 4.2 (Zorn's lemma) *This is a lemma*

Theorem 4.3 *This is a theorem.*

Proof

This is a proof

Remark 4.4 *This is a remark.*

Exercise 4.5 *This is an exercise.*

5 Environments

Here is a `center` environment:

Some text

A `minipage` environment (these are inline environments):

Some text

A `minipage` environment with a `centering` declaration:

Some text

A `minipage` environment with a `raggedleft` declaration:

Some text

A minipage in an fbox:

Some text

6 Mathematics

- An inline equation with TeX delimiters (dollars): $\sum_{n=1}^{\infty} a_n = 1$.
- An inline equation with LaTeX delimiters: $\sum_{n=1}^{\infty} a_n = 1$.

An `equation` environment:

$$\sum_{n=1}^{\infty} a_n = 1. \tag{1}$$

An `equation*` environment:

$$\sum_{n=1}^{\infty} \frac{1}{n^2} = \frac{\pi^2}{6}.$$

A `display` environment with LaTeX delimiters:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}.$$

A `display` environment with TeX delimiters (double-dollars):

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}.$$

A `display` environment containing a `text` command, which itself contains (inline) mathmode:

$$E = mc^2 \text{ where } c \text{ is the speed of light.}$$

6.1 Labelled equations

An equation with a label:

$$e^{i\pi} + 1 = 0. \tag{2}$$

Equation -(2)- is due to Euler.

An `align` environment:

$$x = r \sin\theta \tag{3}$$
$$y = r \cos\theta \tag{4}$$

An `equation` containing three `pmatrix` environments:

$$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix} \qquad \begin{pmatrix} 0 & -i \\ i & 0 \end{pmatrix} \qquad \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix} \tag{5}$$

7 Text

7.1 Spacing

Here is a sum $1 + 1 = 2$. Watch the comma $\sum x_n^2$, is there a space? Seems to be fixed!

Non-breaking spaces

Tildes don't appear in mathmode. Here is an fbox containing lots of them:

$\boxed{A \qquad\qquad\qquad\qquad\qquad\qquad B}$

This is useful to protect mathmode against VLE rewriters.

7.2 Accents

Delimited

- Not spaced: éèŵö.
- Spaced: é è ŵ ö.

Undelimited

- Not spaced: éèŵö.
- Spaced: é è ŵ ö.

Some words ...

- Cramér-Rao.
- Y môr coch.

7.3 Escaped characters

- Not spaced: &%$.
- Spaced: & % $.

We need to be careful with $ characters!

7.4 Font styles

Here are some font style commands (not declarations):

- **bold**
- *italic*
- `teletype`
- SMALL CAPS
- *oblique*

8 Declarations

8.1 Font style

TeX-style teletype: `LatexTree`.

LaTeX-style teletype: `LatexTree`.

- No spaces: pre--inside--post
- No spaces with TeX-style bold: pre--**bold**--post

Remark: unlike Latex the browser compounds font styles:

- first `second` *third* FOURTH *fifth* `sixth` seventh

The browser renders 'third' and 'fifth' are shown in slanted teletype!

8.2 Font style

bf rm sf *it sl* SC `tt` *`em`*

pre--normal **bold** *italic* SMALLCAPS `teletype` normal--post

8.3 Font size

tiny scriptsize footnotesize small normalsize large Large huge Huge

9 Tables

9.1 Inline

An inline `tabular` environment:

α	β	γ
1/2	1/3	1/6

9.2 Display

A centred `tabular` environment:

a	b	c
d	e	f

9.3 Floats

A `table` environment:

Set Theory		Logic		
Union	$A \cup B$	Disjunction	OR	$\vee$
Intersection	$A \cap B$	Conjunction	AND	$\wedge$
Complement	A^c	Negation	NOT	$\neg$

Table 1: Logic and Set Theory

A `table` environment with a starred `caption`:

a	b	c
d	e	f

Another table

10 Cross-references and citations

Here is a labelled theorem containing a labelled equation.

Theorem 10.1 (Pythagoras' Theorem)

$$a^2 + b^2 = c^2. \tag{6}$$

10.1 Cross-references

- Here is a ref -1- to the introduction.
- Here is a ref -10- to the current section.
- Here is a ref -10.1- to the current subsection.
- Here is a ref -10.1- to the above theorem.
- Here is an eqref -(6)- to the equation in the above theorem.

10.2 Citations

- A citation -[1]- to the first bibtex entry.
- A citation -[2]- to the second bibtex entry.
- A citation -[1, 2]- to the first two bibtex entries.

10.3 hyperref

- Here is a url: -http://www.bbc.co.uk/-.
- Here is some -hyperlinked text-.
- Here is a -named cross-reference- to the introduction.
- here is an autoref -section 1- to the introduction.
- Here is a nameref -Introduction- to the introduction.

Document-level labels

For a viewable links to the document-level label we need to use the `hyperref` command as follows: -back-to-top-. There is no number or title associated with the document-level so other xref commands don't know what to display. Document-level labels might be useful to organise documents within and across modules.

11 Verbatim

pre

```
Say \hello wave \goodbye ...
class A():
pass
class B(A):
pass
```

post

12 Figures

We parse the optional argument to `includegraphics`. The `Image` class has an attribute `width` expressed as a percentage. This is computed from the (optional) `scale` or `width` parameters passed to `includegraphics`.

- Figure 12.1 is a nice size (scale = 0.25).
- Figure 12.2 is a bigger version (scale = 0.5).
- Figure 12.3 shows a figure layout using `tabular`.

Here is a figure with `scale=0.25`:

Here is the same figure with `scale=0.5`:

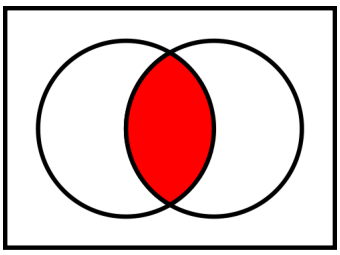


Figure 12.1: Set intersection (scale=0.25)

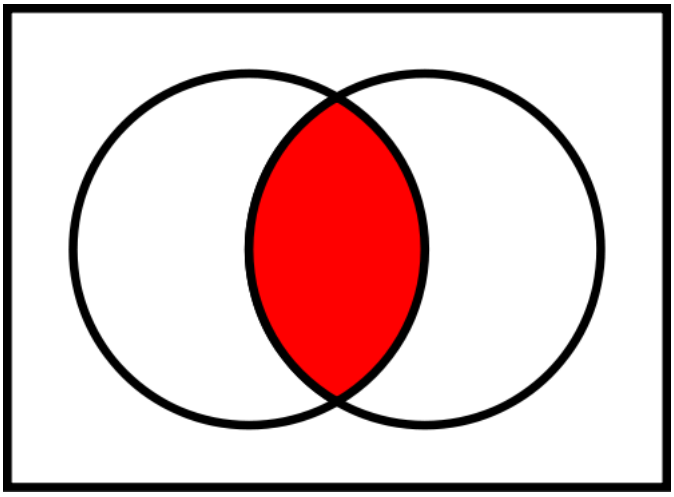
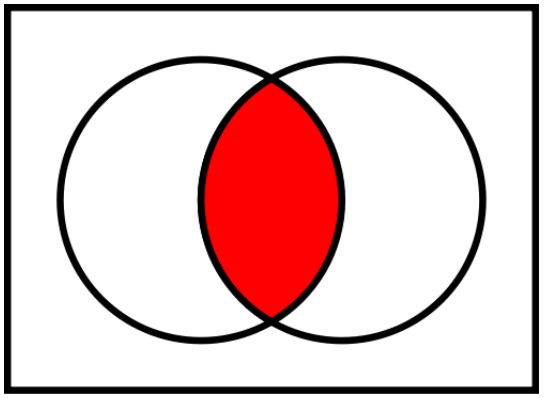


Figure 12.2: A bigger version

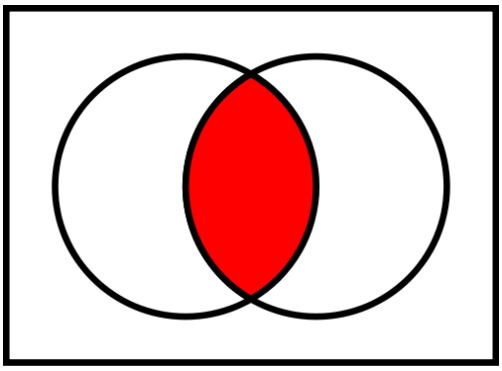
Here are nested `minipages` with `scale=0.4`:

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

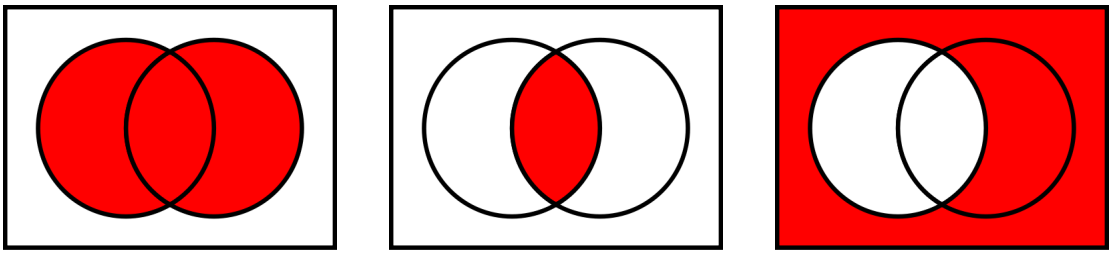


Here are nested `minipages` with `width=0.8*linewidth`:

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.



Here are three images in a `tabular` inside a `figure`:



Union Intersection Complementation

Figure 12.3: Three images in a `tabular` inside a `figure`.

13 Videos

Embedding videos in PDFs is difficult and unreliable, it's much easier to include hyperlinks to online videos using the `url` and `href` commands.

13.1 `url` commands

Please watch this video: https://www.youtube.com/watch?v=oCDXhvXye9E.

13.2 `href` commands

Please watch this video.

13.3 Floating `video` environments

We define a new float called `video` which uses the custom `includevideo` command. This command is intended to mirror the way that `includegraphics` is used within `figure` floats. In the PDF version this is again rendered as a hyperlink, but `LatexTree` embeds the video into the webpage.

Why does it need to be a `float` instead of a simple environment?

- For PDF it's simply a centred/displayed URL in Latex (one line).
- For HTML there's no need to float it!

Nevertheless it gives displayed videos the look and feel of figures and tables in terms of boxes, captions, etc. and we can have a list-of-videos (`lov`) too.

To get an embed code for a YouTube video, click on `Share->Embed` under the video and it will generate an entire `iframe` tag from which the URL can be easily recovered.

Link To Video

Video 13.1: Listen and learn folks!

13.4 Beltram Vol. I

Link To Video Acid Over	Link To Video We Gonna Rock
Link To Video Passion	Link To Video Last Rhythm

Video 13.2: Four aces ♡♢♣♠

Can we link to a dropbox file?

Link To Video

References

[1] Geoffrey R. Grimmett and David R. Stirzaker. *Probability and Random Processes*. Oxford University Press, third edition, 2001.

[2] Robert V. Hogg, Joseph W. McKean and Allen T. Craig. *Introduction to Mathematical Statistics*. Prentice Hall, sixth edition, 2005.