LaTeX PROJECT MANAGEMENT

To be consistent for most LaTeX projects, I choose AOS's preprint version as the default, please check https://vtex-soft.github.io/texsupport.ims-aos/ for more details.

The references are managed externally by Zotero and BBT, exported to BibTex format, then included via `natbib`.

1. Font size warnings. Sometimes you will see warnings like

```
LaTeX Font Warning: Font shape `OML/cmm/m/it' in size <5.5> not available
(Font)              size <5> substituted on input line 50.
```

It is usually solved by `lmodern`, `anyfontsize` and `fix-cm` (which I used) packages.

2. Formatting. Ended up using the `latexindent` that comes with MacTeX distribution. It can be updated in TeX Live Utility.app, the default settings can be found in `indent.log`:

```
/usr/local/texlive/2025/texmf-dist/scripts/latexindent/defaultSettings.yaml
```

To modify, I created a file `~/.indentconfig.yaml` as:

```
# Paths to user settings for latexindent.pl
paths:
- ~/projects/latex-shared/latexindent.yaml
```

The file `latexindent.yaml` is managed in my git repo. Other settings: https://latexindentpl.readthedocs.io/en/latest/index.html.

3. Referencing.

4. Project structure.

4.1. *Shared files.* Currently, I have my files used across different LaTeX saved in one github repo where I make symbolic link so that I could use shortcuts like probability $\mathrm{P}(X)$ directly by including directly.

4.2. *Single file.* This is the default with one-file project, easy to track.

```
├── fig
│   ├── plots.pdf
├── main.bib
├── main.tex
├── main.pdf
├── marco.tex              % All my collected macros
├── custom-style.cls/def/sty/bst
```

4.3. *Multi-files.* Below is a larger LaTeX with different chapters:

```
├── chapters
│   ├── 01-blabla.tex
├── fig
│   ├── R/Python.pdf
│   ├── TikZ.tex
│   ├── TikZ.pdf
│   ├── Asymptote.asy
```

```
│   ├── Asymptote.pdf
├── main.bib
├── main.tex
├── main.pdf
├── marco.tex             % All my collected macros
├── custom-style.cls/def/sty/bst
```

5. Plotting.

5.1. *Take-home messages.*

- w:h = 4:3
- w = 2.8in: <= 0.45 of the linewidth
- no scaling
- some white space or hfill to avoid flushing the plots

Why all the troubles? This is just to solve the problem: there should be no scaling involved from the included figures to the LaTeX document so that the font size (e.g. 8) in figures produced by R/Python will also be 8 in final pdf. If not, there might be some scaling, you never know!

TABLE 1
linewidth of aos preprint

unit	length
in	5.61893in
cm	14.26724cm
pt	406.0pt
bp	404.48221bp

To be consistent about the unit used in different plotting, *inch* is used mainly due to matplotlib. Another thing to note that 1 in is 72.27 pt while other is 72 pt, which is another thing to note in TikZ.

However, the TikZ did not output a pdf file at 2.8x2.1in despite explicit specification. No solution is found so I will stick to R for the time being.

Between subfigure, a small spacing is added. Please check the document source code.

TABLE 2
Suggested width and height in inches for aos document

	width	height
Single plot	5.6	4.2
Two plots	2.8	2.1

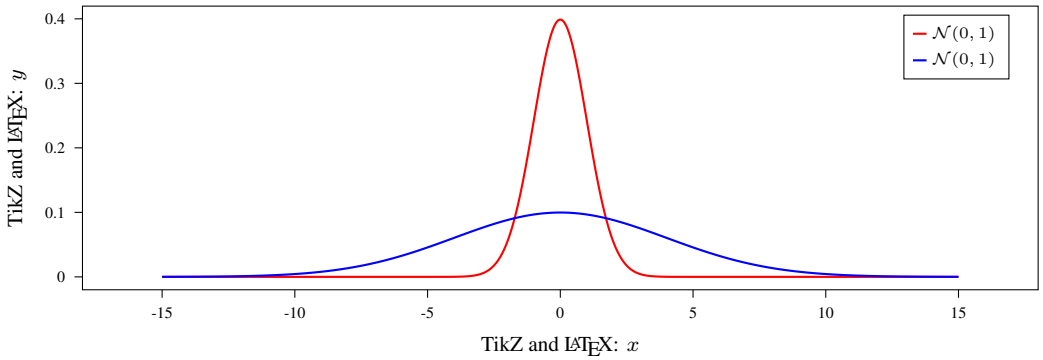
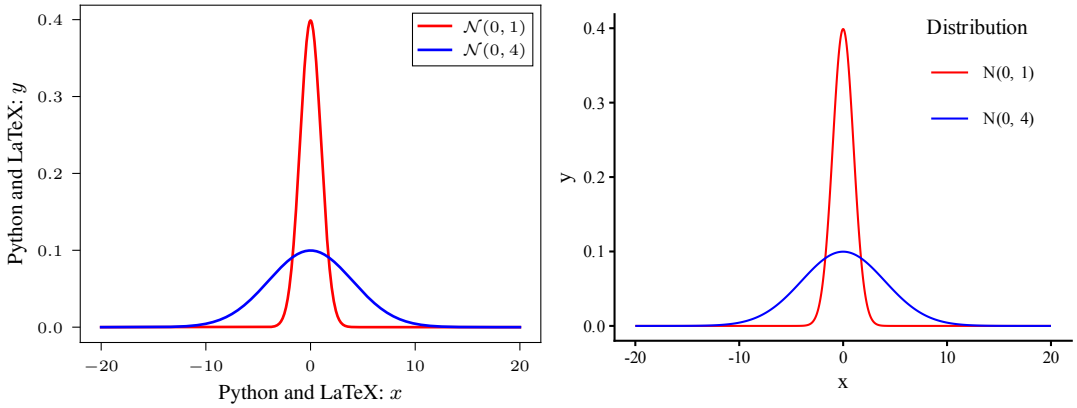


Fig 1: TikZ, exact physical size, no scaling.



(a) Python x (b) R

Fig 2: Python vs R plots, exact physical size, no scaling.

6. Mathematical notation. It has always been a hassle to organise mathematical notation across different sources, in fact, I would go so far as to argue that this is the most annoying thing when one starts reading a book or an article.

However, there *must be* some notational conflicts beyond primary school simply due to the fact that the limited number of alphabets (**26**). For example, "$\mathbb{E}$" might be energy in physics while it could refer to expectation or scores in probability.

Another difficulty is that the authors often assume some familiarity in the topics *also* I am expected to read in some logical or chronological order. In reality, I am constantly jumping back and forth between one literature to another.

$$\mathbb{A}, \mathbb{B}, \mathbb{C}, \mathbb{D}, \mathbb{E}, \mathbb{F}, \mathbb{G}, \mathbb{H}, \mathbb{J}, \mathbb{K}, \mathbb{L}, \mathbb{M}, \mathbb{N}, \mathbb{O}, \mathbb{P}, \mathbb{Q}, \mathbb{R}, \mathbb{S}, \mathbb{T}, \mathbb{U}, \mathbb{V}, \mathbb{W}, \mathbb{X}, \mathbb{Y}, \mathbb{Z}$$
$$\mathcal{A}, \mathcal{B}, \mathcal{C}, \mathcal{D}, \mathcal{E}, \mathcal{F}, \mathcal{G}, \mathcal{H}, \mathcal{I}, \mathcal{J}, \mathcal{K}, \mathcal{L}, \mathcal{M}, \mathcal{N}, \mathcal{O}, \mathcal{P}, \mathcal{Q}, \mathcal{R}, \mathcal{S}, \mathcal{T}, \mathcal{U}, \mathcal{V}, \mathcal{W}, \mathcal{X}, \mathcal{Y}, \mathcal{Z}$$
$$\mathfrak{A}, \mathfrak{B}, \mathfrak{C}, \mathfrak{D}, \mathfrak{E}, \mathfrak{F}, \mathfrak{G}, \mathfrak{H}, \mathfrak{I}, \mathfrak{J}, \mathfrak{K}, \mathfrak{L}, \mathfrak{M}, \mathfrak{N}, \mathfrak{O}, \mathfrak{P}, \mathfrak{Q}, \mathfrak{R}, \mathfrak{S}, \mathfrak{T}, \mathfrak{U}, \mathfrak{V}, \mathfrak{W}, \mathfrak{X}, \mathfrak{Y}, \mathfrak{Z}$$

$$\arg\inf, \arg\sup, \arg\max, \arg\min, \operatorname{conv}$$

This stackexchange answer: https://tex.stackexchange.com/a/58124 is probably the most comprehensive answer to which fonts are shown in LaTeX.

Symbol	Usage	Comments
$\mathbb{B}$	`\*f`	blackboard bold except `\If` due to conflict
$\mathcal{B}$	`\*c`	calligraphic font
$\mathfrak{B}$	`\*k`	Fraktur font

6.1. *Choose the notations and shortcuts wisely.* I am not even talking about the difference due to differences in fonts and italic or roman. It is just a very sad thing that we don't even have a unified way of saying probability is just sad. Take probability for example and return to the most basic case of tossing a coin where the sample space is $\mathcal{A} = \{H, T\}$. I have come across:

$$P() \quad \mathrm{P}() \quad \Pr() \quad \mathsf{P}() \quad \mathbf{Prob}().$$