RANDOM UNIVERSITY
FACULTY OF WHATEVER SCIENCES

A sleek LaTeX template

With a sleeker title-page

Author
François ROZET

June 1, 2021

Contents

Chapter 1

Introduction

Sleek Template is a minimal collection of LaTeX packages and settings that ease the writing of beautiful documents. While originally meant for theses, it is perfectly suitable for project reports, articles, syntheses, etc. – with a few adjustments, like margins.

It is composed of four separate packages – `sleek`, `sleek-title`, `sleek-theorems` and `sleek-listings` – each of which can be used individually.

```
\usepackage[english]{babel}
\usepackage[noheader]{packages/sleek}
\usepackage{packages/sleek-title}
```

Listing 1.1: Example of Sleek Template packages usage.

If you are a LaTeX beginner consider the excellent tutorial "Learn LaTeX in 30 minutes", Overleaf [1]. Also, there are a lot of symbols available in LaTeX and, therefore, in this template. I recommend the use of "The comprehensive LaTeX symbol list", Pakin [2] for searching symbols.

Chapter 2

Features

2.1 `sleek`

`sleek` is the main package. It imports the packages (see Table A.1) and setups the settings that make Sleek Template easy to use.

There are three available options to the `sleek` package :

1. `parindent` add indentation to the first line of paragraphs;
2. `noheader` removes the document header;
3. `french` changes the decimal sign to a comma and translates some captions.

But nothing prevents you to tweak the settings to your liking in the source code.

2.1.1 Mathematics

This template uses `amsmath` and `amssymb`, which are the de-facto standard for typesetting mathematics. Additionally, `esint` provides alternative integral symbols (*cf.* Table 78 in [2]) and `bm` is used for bold math symbols like vectors (see (2.1)).

A few custom macros have also been added such as `\rbk`, `\sbk` and `\cbk` for respectively round, square and curly brackets or `\abs` for absolute value. Here follows some examples showcasing what is possible with the default packages of `sleek`.

$$\left(\frac{\pi}{2}\right), \quad \left[\frac{\pi}{2}\right], \quad \left\{\frac{\pi}{2}\right\}, \quad \left|\frac{\pi}{2}\right|, \quad \left\|\frac{\pi}{2}\right\|, \quad \left\lceil\frac{\pi}{2}\right\rceil, \quad \left\lfloor\frac{\pi}{2}\right\rfloor$$

$$\oiint_S \boldsymbol{E} \cdot \mathrm{d}\boldsymbol{s} = \iiint_V \frac{\rho}{\varepsilon_0}\,\mathrm{d}V \tag{2.1}$$

$$e = \sum_{n=0}^{\infty} \frac{1}{n!}$$

$$\frac{\mathrm{d}x}{\mathrm{d}t} = \alpha x - \beta xy \tag{2.2a}$$

$$\frac{\mathrm{d}y}{\mathrm{d}t} = \delta xy - \gamma y \tag{2.2b}$$

$$\ln|x| + C = \int \frac{1}{x}\,\mathrm{d}x$$

$$\exp(x) = \lim_{n \to \infty} \left(1 + \frac{x}{n}\right)^n$$

$$\begin{cases} x = r\sin\theta\cos\phi \\ y = r\sin\theta\sin\phi \\ z = r\cos\theta \end{cases} \tag{2.3}$$

$$P(A, B) = P(A \mid B)P(B)$$

$$\Leftrightarrow \quad P(A \mid B) = \frac{P(A, B)}{P(B)}$$

$$= P(B \mid A)\frac{P(A)}{P(B)}$$

2.1.2 Units

The `siunitx` package provides three commands to typeset numbers and quantities – `\num`, `\si` and `\SI` – as well as various units (see Table A.4).

It is possible to write, both in text or math modes, numbers without units (*e.g.* 1, 1.0, −1, 3.141 59, 10^{100}, $N_A = 6.022 \times 10^{23}$), units without quantity (*e.g.* $\mathrm{J} = \mathrm{N\,m} = \mathrm{kg\,m^2\,s^{-2}}$) and, finally, quantities with their units (*e.g.* $9.81\,\mathrm{m\,s^{-2}}$, $c = 299.6 \times 10^6\,\mathrm{m\,s^{-1}}$).

2.1.3 Lists

Sleek Template uses `enumitem` to enhance the listing capabilities of LaTeX. There are several lists environments:

- `itemize` for unordered lists;
- `enumerate` for ordered lists;
- `description` for descriptive lists.

In a list, each element is preceded by the command `\item`. It is possible to modify the labels 1. individually with `\item[newLabel]` or 2. for the whole environment with the `label=newLabel` option.

In the case of `enumerate`, `newLabel` can contain special expressions (see Table A.5) that will adapt to the item number. For example, `label=(\alph*)` defines the label sequence "(a), (b), (c), ...". Still in the case of `enumerate`, the `\setcounter` and `\addtocounter` commands allow to modify the current item number.

One could want to reduce the space between items with the `noitemsep` option or to delete the left margin with the `leftmargin=*` option.

It is also possible to write nested lists. Here follows a very condensed example.

- Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.

  Arcu ac tortor dignissim convallis aenean et tortor. In eu mi bibendum neque egestas congue quisque.

+ Semper quis lectus nulla at volutpat diam ut. Felis eget velit aliquet sagittis id. Blandit aliquam etiam erat velit scelerisque in dictum non consectetur.

$$a^2 + b^2 = c^2 \tag{2.4}$$

- Nibh sed pulvinar proin gravida hendrerit lectus. Pretium aenean pharetra magna ac placerat vestibulum lectus mauris. Non consectetur a erat nam at lectus urna duis.

  i. Nibh tortor id aliquet lectus. Sit amet justo donec enim diam vulputate ut pharetra sit.
  iv. Condimentum id venenatis a condimentum vitae. Quis eleifend quam adipiscing vitae proin sagittis nisl.
  xx. Proin sagittis nisl rhoncus mattis rhoncus urna neque viverra.

- Elit scelerisque mauris pellentesque pulvinar pellentesque habitant morbi tristique senectus.

  Ridiculus mus mauris vitae ultricies leo. Mollis aliquam ut porttitor leo a diam. Velit egestas dui id ornare arcu odio ut sem nulla.

  Nullam vehicula ipsum a arcu. Nibh sit amet commodo nulla facilisi nullam. At erat pellentesque adipiscing commodo elit. Libero volutpat sed cras ornare arcu dui.

2.1.4 Figures

Thanks to the `graphicx` package, it is possible to include external graphic documents (images, plots, etc.) in your document with the `\includegraphics` command. Most image type format (`jpg`, `png`, `bmp`, etc.) are supported by this command. However, it should be noted that it is highly preferable to use vectorial types, such as `pdf` or `eps`.

Figure 2.1: Random University logo.

2.1.5 Tables

The packages `multicol` and `multirow` comes handy for complex table formatting such as multi-column or multi-row cells.

a			qrs
b	ef	jkl	tuvx
cd	ghi	mnop	wyz

Table 2.1: Example of multi-column cells.

	b	c
a	de	fg
	hij	klm
nopq	rstuv	wxyz

Table 2.2: Example of multi-row cells.

The `booktabs` package also provides tools to build publication-ready tables. The tables in Appendix A are good examples.

2.2 `sleek-title`

Sleek Template offers a custom title-page with the package `sleek-title`. The formatting of the title-page is automatically inferred from the fields that the user has provided.

The fields are `\logo`, `\institute`, `\faculty`, `\department`, `\title`, `\subtitle`, `\author`, `\supervisor`, `\context` and `\date`.

Among these, only `\title`, `\author` and `\date` have to be provided. However, none of the fields should stay empty. Prefer deleting or commenting the line if so.

```
\logo{./resources/pdf/logo.pdf}
\institute{Random University}
\faculty{Faculty of Whatever Sciences}
%\department{Department of Anything but Psychology}
\title{A sleek \LaTeX{} template}
\subtitle{With a sleeker title-page}
\author{\textit{Author}\\Francois \textsc{Rozet}}
%\supervisor{Linus \textsc{Torvalds}}
%\context{Well, I was bored...}
\date{\today}
```

Listing 2.1: Example of `sleek-title` title-page definition.

It is also possible to use Sleek Template without `sleek-title`, in which case the default LaTeX title-page will be used.

2.3 `sleek-theorems`

`sleek-theorems` is based on the `amsthm` and `thmtools` packages. It provides a handful of theorem-like environments, each of which have different style and purpose.

The environments are `theorem`, `lemma`, `proposition`, `proof`, `definition`, `hypothesis`, `method`, `question`, `answer`, `example`, `remark`, `note` and `tip`.

Note. The option `french` translates the name of each provided environment. It is also possible, and easy, to add your own language as an option in the source code.

Theorem 1 (Triangle inequality)**.** *Let be a triangle in Euclidean space. Then the sum of the lengths of two of its sides always surpass or equals the length of the third.*

Proof 1.1. Let a, b and c be the lengths of the sides of a triangle in Euclidean space and α, β, γ their respective opposite angle. By the generalized Pythagoras' theorem, we have

$$c^2 = a^2 + b^2 - 2ab\cos\gamma$$
$$\leq a^2 + b^2 + 2ab$$
$$\leq (a+b)^2$$
$$\Leftrightarrow \quad c \leq a + b$$

Therefore in any triangle, the sum of the lengths of two sides always surpass or equals the length of the third. ∎

In addition, these environments also have framed versions – `fmd-theorem`, `fmd-lemma`, etc. – for better encapsulation.

Theorem 2. Triangle inequality

Let be a triangle in Euclidean space. Then the sum of the lengths of two of its sides always surpass or equals the length of the third.

Proof 2.1

Let a, b and c be the lengths of the sides of a triangle in Euclidean space and α, β, γ their respective opposite angle. By the generalized Pythagoras' theorem, we have

$$c^2 = a^2 + b^2 - 2ab\cos\gamma$$
$$\leq a^2 + b^2 + 2ab$$
$$\leq (a+b)^2$$
$$\Leftrightarrow \quad c \leq a + b$$

Therefore in any triangle, the sum of the lengths of two sides always surpass or equals the length of the third. ∎

Question

Based on the theorem 2, what is the shortest path from a point A to a point B in Euclidean geometry ?

2.4 `sleek-listings`

The `sleek-listings` package is a small collection of styles for the environments of the `listings` package, which is useful to showcase nicely samples of code.

Currently, the basic styles `default` and `monokai` are implemented. The former is a neutral style (no line numbering, no frame, only good old black code) while the latter is an all-framed style reproducing the iconic Monokai color-map.

In addition, the language styles `c`, `cpp`, `matlab`, `python` and `java` are implemented, with basic color-maps.

Finally, some commands to build upon existing styles are provided :

- `\NumberStyle{stylename}` creates a style `stylenameNumber` with line numbering;
- `\FrameStyle{stylename}` creates a style `stylenameFrame` with an all around frame;
- `\FrameTBStyle{stylename}` creates a style `stylenameFrameTB` with top and bottom line rules;
- `\FrameNumberStyle{stylename}` and `\FrameTBNumberStyle{stylename}` have the same logic.

For example, the `\FrameTBStyle{python}` command creates the `pythonFrameTB` style, which can then be used to showcase `Python` code.

```python
import numpy as np # Unnecessary import

a, b = 69., .420

def f(a: float, b: float) -> float:
    r"""
    Sum two numbers

    Parameters
    ----------
    a: first number
    b: second number

    Returns
    -------
    the sum of 'a' and 'b'
    """

    return a + b

c = f(a, b)

print('{:f} + {:f} equals {:f}'.format(a, b, c))
```

Bibliography

[1] Overleaf. "Learn LaTeX in 30 minutes". URL: https://www.overleaf.com/learn/latex/Learn_LaTeX_in_30_minutes (page 1).

[2] Scott Pakin. "The comprehensive LaTeX symbol list". 2020. URL: http://tug.ctan.org/info/symbols/comprehensive/symbols-a4.pdf (pages 1, 2).

Appendix A

Tables

Package	Purpose
amsmath	Mathematical typesetting
amsthm	Mathematical environments for theorems, proofs, etc.
booktabs	Weighted rules for tables
biblatex	Bibliography
csquotes	Inline and display quotations
enumitem	Lists and enumerations
float	Floating objects such as figures and tables
graphicx	Graphics
hyperref	Hyperlinks and bookmarks
listings	Code listings
multicol	Table cells that span multiple columns
multirow	Table cells that span multiple rows
siunitx	Typesetting of units
subcaption	Sub-figures and sub-captions

Table A.1: List of the most relevant packages imported by Sleek Template.

\emph{abcABC123}	*abcABC123*
\bfseries{abcABC123}	**abcABC123**
\itshape{abcABC123}	*abcABC123*
\lowercase{abcABC123}	abcabc123
\normalfont{abcABC123}	abcABC123
\textbf{abcABC123}	**abcABC123**
\textit{abcABC123}	*abcABC123*
\textsc{abcABC123}	ABCABC123
\textsf{abcABC123}	abcABC123
\textsl{abcABC123}	*abcABC123*
\textsubscript{abcABC123}	abcABC123
^{abcABC123}	abcABC123
\texttt{abcABC123}	abcABC123
\underline{abcABC123}	<u>abcABC123</u>
\uppercase{abcABC123}	ABCABC123

Table A.2: Available text fonts in LaTeX.

$\mathcal{abcABC123}$	$\dashv\sqcup\mathcal{ABC}\infty\in\ni$
$\mathit{abcABC123}$	$abcABC123$
$\mathnormal{abcABC123}$	$abcABC123$
$\mathrm{abcABC123}$	$\mathrm{abcABC123}$
$\mathbb{abcABC123}$	$\supset\mathbb{ABC}\Bbbk\Bbbk\Bbbk$
$\mathfrak{abcABC123}$	$\mathfrak{abcABC123}$

Table A.3: Available math fonts in LaTeX and AMS.

\metre	m	\second	s	\mole	mol
\meter	m	\ampere	A	\candela	cd
\kilogram	kg	\kelvin	K		
\hertz	Hz	\farad	F	\lumen	lm
\newton	N	\ohm	Ω	\lux	lx
\pascal	Pa	\siemens	S	\becquerel	Bq
\joule	J	\weber	Wb	\gray	Gy
\watt	W	\tesla	T	\sievert	Sv
\coulomb	C	\henry	H		
\volt	V	\celsius	°C		
\angstrom	Å	\day	d	\liter	L
\arcminute	′	\degree	°	\litre	l
\arcsecond	″	\electronvolt	eV	\minute	min
\barn	b	\gram	g	\neper	Np
\bar	bar	\hectare	ha	\tonne	t
\bel	B	\hour	h		
\yocto	y	\milli	m	\mega	M
\zepto	z	\centi	c	\giga	G
\atto	a	\deci	d	\tera	T
\femto	f	\deca	da	\peta	P
\pico	p	\deka	da	\exa	E
\nano	n	\hecto	h	\zetta	Z
\micro	µ	\kilo	k	\yotta	Y

Table A.4: Available units in the siunitx package.

Expression	Description
\arabic*	Arabic numbers (1, 2, 3, ...)
\alph*	Lowercase letters (a, b, c, ...)
\Alph*	Uppercase letters (A, B, C, ...)
\roman*	Lowercase Roman numerals (i, ii, iii, ...)
\Roman*	Uppercase Roman numerals (I, II, III, ...)

Table A.5: Special expressions for the label of enumerate environments.