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A FANCY UNIVERSITY

AN EVEN FANCIER LAB

Sylvain Kern

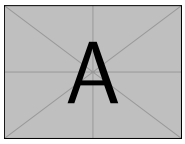
`tufte-style-thesis`, a Tufte-styled LaTeX class for theses

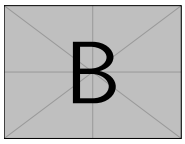
Actually more of a mix
between Edward Tufte and Robert Bringhurst

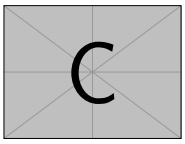
Doctoral thesis

February 18, 2022

Supervisor	their name	their job
Cosupervisor	also their name	also their job
Jury members	jury 1	jobs
	jury 2	…







Sylvain Kern, `tufte-style-thesis`,
a Tufte-styled LaTeX class for theses, Actually more of a mix
between Edward Tufte and Robert Bringhurst, February 18, 2022.

For my homies

Abstract

Basically a thesis (book?) class for Tufte lovers like myself. I am aware that `tufte-latex` already exists but I just wanted to create my own thing.

Acknowledgements

shoutouts to my man Tufte.

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TODO #1

List of figures: mettre les numéros de page sur une colonne dédiée à droite

TODO #2

List of listings: faire que ça ait la même gueule que list of figures

1 *Notes on the design*

This class is my personal mix of different book design influences: mainly the works of Edward R. Tufte,[1] known for the big margin and the plentiness of sidenotes and sidecaptions. The margins are however not as prominent as in Tufte's works, the main text takes a bit more space, more like in Robert Bringhurt's typographer's bible.[2] So it is a bit of a mix of Tufte and Bringhurst, with some of my own choices for other design features, as we will see through this chapter.

1 [1] E. R. Tufte, *The Visual Display of Quantitative Information*, 2001, [2] E. R. Tufte, *Beautiful Evidence*, 2006, [3] E. R. Tufte, *Envisioning Information*, 1990, [4] E. R. Tufte, *Visual Explanations*, 1997.

2 [5] R. Bringhurst, *The Elements of Typographic Style*, 2002.

1.1 *Document layout*

While `tufte-style-thesis` is a class for typesetting theses, the general layout is pretty much the same as in a regular book. A book is traditionally divided into three major sections: the front matter, the main matter and the back matter.

The *front matter* is for all the stuff that comes before the main content: the preface, the acknowledgements, table of contents (TOC) and list of various types. The pages are most widely printed in roman numerals for this part. However, I personally find it confusing and a bit useless so the page numbering system is simplified for the whole book: arabic numerals starting from the very first page of the document.[3] The frontmatter still remains relevant because chapters are unnumbered, and LaTeX conveniently places them in the TOC.

3 Tufte and Bringhurst do full arabic in their work too, so I consider it legit.

The *main matter* is, as its name suggests, for the main content. Here everything is normal, arabic page numbering, normally numbered chapters. At the end of the mainmatter there are usually appendices, especially for scientific and technical textbooks ; for me, an appendix seems necessary in a thesis to put big figures, tables, and content that can be referred to in the main text but are too intrusive to put in the heart of the document. Chapters in the appendix are numbered with a letter to distinguish them from the main content. The main matter can also be cut in a couple of parts.[4]

4 I like, for instance, to put the appendix in a dedicated part.

The *back matter* is the end of the book, usually for the references part and index or glossary. Chapter numbering is turned off. At the very end, a colophon[5] can be put to state information about the printer, publisher and stuff like that.

5 [6] J. Carter and N. Barker, *ABC for Book collectors*, 2004.

To sum this up, the structure of a document typeset with `tufte-style-thesis` is something like this:

- titlepage ;
- front matter (dedication, abstract, acknowledgements, table of contents, list of figures, *etc*) ;
- main matter (main content organized in numbered chapters, an appendix with letter chapters) ;
- back matter (references, index, glossary, colophon).

This is how LaTeX books work, and how I advise to structure a document using this class. All of this is under a single page numbering system, arabics starting right from the titlepage. Eventually, this is a really heavy layout, see how the first chapter of content starts at page 18. So do not use this class unless you have a hefty content to fit all these organizing features.

1.2 *Page layout*

Maybe the most distinctive aspect of this class is its page layout with its big margin to put sidenotes and captions. However this is not original at all: plenty[6] of other LaTeX classes for books and theses do it just like me, and almost always better[7] I just wanted to do my own thing here, mixing what I personally like the most in these layout types, to better learn LaTeX and to really internalize this kind of design. At the end of the day it may be a more Bringhursty than Tuftey kind of look, but hey, I won't change the name of this whole thing now.

6.

7 Or in a way cleaner LaTeX.

So, as you might have started to notice, the main feature of this thing is the margin, with the sidenotes, side references, and as you will discover, side captions and everything. It has three main advantages for me:[8]

- it makes the main text area narrower, therefore easier to read as the line changes become smoother, sidenotes are also friendlier than footnotes ;
- it makes the design breathe with plenty of potential white space (when the margins are not too crowded) ;
- it organizes the content: non-prosaic elements are on the side, separated from the main text area which becomes less cluttered.

So this is more intended for people who like "flavoured" text: people who likes notes, parentheses, asides, *etc.* It is also more suited for topics needing lots of pictures, tables, and diagrams: a novel would look terrible with this kind of layout.

8 These advantages can be seen as drawbacks for others: less space for the actually important content, irregular and somewhat unconventional design which can be harder to handle.

Another small detail on the sidenotes, the flag of a note is in superscript in the text, but the note itself is introduced by a number in full size: this is in superscript …[9] This is again one of Bringhurst's advices.

9 …whereas this is in normal size.

1.3 *Headers, lists, and other content-organizing features*

The principle here is to give structuring elements which are as unobtrusive as possible, while remaining clear and easy to follow. For example, the bold headers of vanilla LaTeX have been changed for more subtle italic ones. Chapters titles have been simplified to their essential parts –a number and a title– and put as high as possible: it is completely useless to me to start a new chapter at the middle of a page.[10] Though, some of space is left after the title to let it breathe a little bit ; this is a feature of Tufte's books.

10 Bringhurst roasts this kind of chapters in his *Elements*: *"In modern books, where the titles are shorter and the margins have been eaten by inflationary pressure, a third of the page somewhat lies vacant just to celebrate the fact that the chapter begins"*.

The TOC, and the other lists as well as the index and references section are thought to be that way: friendly and unobtrusive. For example, in the TOC, the traditional dotted lines between a heading and its corresponding folio[11] is useless and unfriendly: why have the reader to follow a line with their eyes instead of just placing the page number next to the heading? So I adapted the

11 Just flexin, folio is a fancy term for saying "page number".

TOC to make it both expressive and light/minimalistic.[12] It does not support deeper headings than the section, because I think nobody looks for such detail in the table of contents.

12 I find Tufte- and Bringhurst-style TOCs too empty, at least for a thesis.

1.4 *Fonts and "micro" typography*

This class has three fonts.

The main text is typeset with a version of Linux Libertine,[13] with enhanced math support. Here it is in **bold** and *italic*.

13 [7], *Libertine Fonts – Libre multilingual font family.*

Sans serif text, like in the titlepage, part titles and page headers (not chapter/section titles, but small reminders at the very top of the pages) are in sans serif Gill Sans, actually Gillius, a version of Gill Sans for LaTeX. Here it is in **bold** and *italics*. Gill Sans is a humanist sans-serif typeface, which I find both elegant and minimalistic. It is less harsh than grotesk fonts like Helvetica or Arial.

Mono text, for code listings, is `Droid Sans Mono`. It is smoother to my taste than the default courier-like font. Here it is in `italics` (unfortunately it does not support bold –yet).

By "micro" typography I mean typography at the paragraph level, as opposed to the more general aspects of the design that have been covered above. But do not worry, I will talk about true *microtypography* a little bit later. So, the prose is organized in paragraphs indented at the first line, as it is classically seen. The first paragraph that comes after a heading, however, is not indented.[14] The text is by default not justified on the right like in Tufte's books. Apparently it makes the lines easier to recognize and follow with the eyes ; I do not find this irregularity unpleasing. But *do not worry*, it can be fully justfied really easily.[15]

14 It is again an advice from Bringhurst: *"The simplest way to start any block of prose is to start from the margin, flush left [...]."*

15 I hope people have not been bummed out at by not seeing the right-justfication.

For true microtypography, when the text is fully justified (like this one), the dashes, commas, points and other stuff slightly protrude in the margin to make it seem more justified than it really is.[16] For flush left text, the typesetting algorithm has also been upgraded from standard LaTeX, reducing the line length and space width variance, and hyphenating as less as possible. Also, the spaces between small caps increase a little bit, as well as they can be increased for full caps text.

16 Paradoxically, it seems more justified than when it is truly justified. See by yourself: put a ruler (or the side of the window on the right side of the text and see how the comma slightly protrudes).

1.5 *Ideas behind the design*

These are just some thoughts I gathered that I find interesting to consider when making designs, closely or remotely.

As Antoine de Saint-Exupéry once wrote:[17] *"Perfection has been reached not when there is nothing left to add, but when there is nothing left to take away"*. To me, this means that minimalism is a key aspect of document design. The features and the layout must let the true content express itself: a good typography is completely transparent. That is why the design is dependent of the content: a novel and a math textbook will have completely different designs.

17 [8] A. de Saint-Exupéry, *Terre des Hommes*, 1939.

However, this whole Tufte-style design is far from transparent. It is easily recognizable, and people will notice the somewhat unusual design statements.

Paul Rand said,[18] *"The public is more familiar with bad design than good design. It is in effect, conditioned to prefer bad design, because that is what it lives with. The new becomes threatening, the old reassuring"*. Edgar Tufte completely re-thought the way to display scatterplots, curves and axes, boxplots and histograms, but most people are not used to see this optimized representation, so is it a better design if most people have to give some extra effort to adapt to it ?

Then, good design must be a cultural thing. To aim perfection, one must make a blend between innovation and tradition, to be percieved as smooth as possible for the majority of people.

So, yeah, I really don't know what to think. I find –actually I hope that sidenotes and margins benefit to the reading comfort instead of ruinig it. It makes more sense when there are figures, tables and heavier stuff, but hopefully it remains relevant for prose with notes.

18 Yeah, I lazily picked the two citations on the first page of the tufte-style book class showcase. Though, I find Paul Rand's a bit condescending, like, *"people know nothing about good design"*.

PART I

HOW TO USE THIS CLASS

2 *Getting started*

2.1 *On Linux*

2.2 *On Windows*

2.3 *On Overleaf*

3 *Using this class*

3.1 *The big margin*

There is a big margin, so feel free to use it as much as possible![1] This chapter will cover the usage of sidenotes, side references, and other ways to use the margin.[2]

The general layout is done using the `geometry`[3] package, and all the margin stuff relies on the `sidenotes`[4] package, so check its documentation:

`http://www.ctan.org/pkg/sidenotes`

for more in-depth information.

1 Actually to your needs, if you do not have a natural usage of notes, maybe do not use this class.

By the way, see how sidenote numbers reset on new chapters: we're back on number 1!

2 For float captions, see chapter 3.4.

3 [9] H. Umeki, "The `geometry` package," 2020.

4 [10] A. Thomas, "The `sidenotes` package," 2020.

Sidenotes

To put a sidenote in the margin, use

```
\sidenote[<number>][<offset>]{<sidenote text>}
```

- `<number>` is an optional parameter for the sidenote number. For example, `\sidenote[29100][]{The sidenote.}` does this.[29100]
- `<offset>` is an offset length (in pt, px, en, em…) to vertically offset the sidenote. A positive value will have it go down, a negative go up.

29100 The sidenote.

LaTeX natively allows to put unformatted content in the margin with the command `\marginpar{<your content>}`, but I advise not to use it, as it puts raw fullsize text in the margin, and does not blend well with the overall design. Instead, use

This is unformatted margin text, in fullsize.

```
\sidetext{<your text>}
```

This is just some unnumbered piece of text in the margin, but with the formatting done right.

This will format the margin text to match the sidenotes style.

Side references

The margin is also handy to put bibliographic references:[5] the reader can read them directly instead of going all through the document to find the right entry in the references section. But don't worry, each reference displayed in the margin is labelled with a number and appears in a dedicated bibliography section. All in all, a side reference is displayed in the margin in a shortened form, and then again in the bibliography in the full form.

5 [11] A. Einstein, *Zur allgemeinen relativitätstheorie*, 1915.

To cite a paper, use

```
\sidecite{<reference label>}
```

3.2 *Full width text*

Sometimes, it can be handy to have the text span the whole page width, like this paragraph. Use the environment `\begin{wide}...\end{wide}` to do this. It should manage page breaks properly, but it is not optimal: no not use it for too long (like for ten pages), the behavior tends to go a little wild. The behavior of `\sidenote`, `\marginpar` and `\sidecite` is not supported in the `wide` environment.

Also, for floating environments, full width figures and tables will be covered in the chapter 3.4, so do not use the `wide` environments with figures or tables (actually tables are fine, but there are specific environments for them to be in full width).

3.3 *The skeleton*

The structure of a LaTeX book is as follows:

```
% preamble
\begin{document}

\maketitle % titlepage

\frontmatter % unnumbered preliminary chapters
\chapter{}
\tableofcontents

\mainmatter % main content: numbered chapters
\part{part}
\chapter{content}
\chapter{content}

\appendix % letter numbered chapters
\chapter{appendix 1}
\chapter{appendix 2}

\backmatter % everything else: references, indexes, glossaries, etc.
\printbibliography
\printindex

\end{document}
```

The new `\maketitle`

The `\maketitle` macro has been slightly pimped up. It now displays a custom titlepage —like the one on this very document, as well as a copyright tag, a dedication word and a colophon.

3.4 *Floats*

The integration of floats with the Tufte layout is handled with the `sidenotes` package, loaded with the class definition. The following paragraphs show how to basically use the macros, and for more information, see the package documentation at `https://www.ctan.org/pkg/sidenotes`.

Figures

Edward Tufte's designs are known to be really tight when it comes to including images with text. The main pet peeve I had with one-column designs is when I included a small figure in the document, it had to visually break the text and generate large unpleasing blank spaces. Also, more often than not, the text width was too much for the images, resulting in huge one-liner captions for very small figures.

The 1.5-column design fixes this by putting all captions in the margins, as well as small enough figures, which tidies the document a lot.

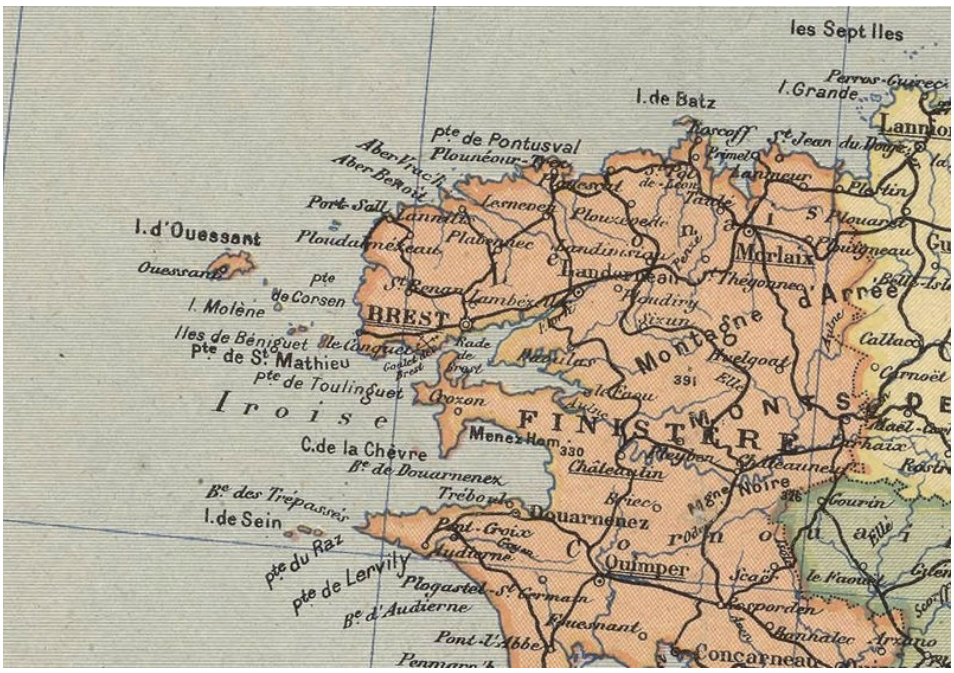

Figure 3.1. 1919 map of the Finistère in French Brittany. This figure is in the main text column, with a caption in the margin aligned with the top of the image. For images narrower than the text width, they will be outer-aligned so that they remain just next their caption.

To put a graphics in the text like in the figure 3.1, use[6]

```
\begin{figure}
  \sidecaption{<caption>\label{<label>}} % put this on top
  % \label HAS to be inside the \sidecaption
  \includegraphics[]{<>} % or tikz or anything
\end{figure}
```

To put a figure in the margin like the figure 3.2, use

6 The `\label` *has* to be inside the `\sidecaption` command, otherwise references with `\ref` won't work.

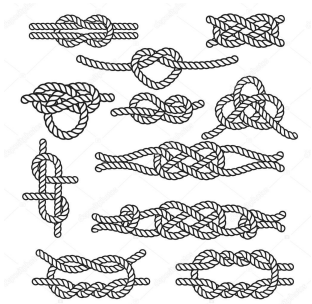

Figure 3.2. The most common sea boat knots. This image can be displayed rather

```
\begin{marginfigure}
  \includegraphics[]{<>} % or tikz or anything
  \caption{<caption>\label{<label>}}
\end{figure}
```

For wide figures like the figure 3.3, use

```
\begin{figure*}
  \includegraphics[]{<>} % or tikz or anything
  \sidecaption{<caption>\label{<label>}}
\end{figure*}
```

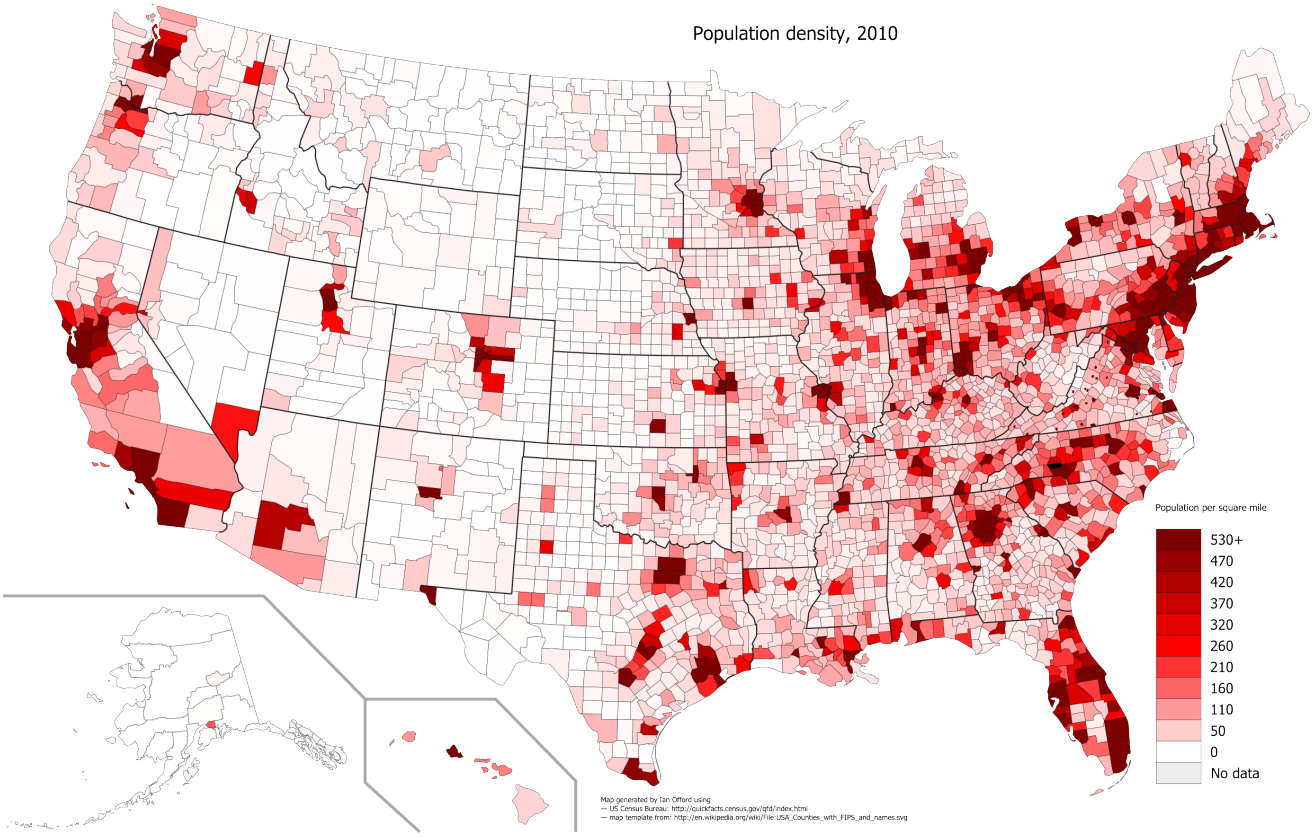

Figure 3.3. The US census map from data collected in 2010 – `www.ecpmlangues.u-strasbg.fr`
This is a wide figure, stretching from the innermost to the outermost margin.

Shortcuts

I find typing figure environments repetitive for long (even short) documents, so I made the following macro for figures with `\sidecaptions` :

```
\textfig[<optional width>]{<file path>}{<caption>}{<label>}
```

The `<optional width>` is a number between zero and one wich determines the image width relative to the text width. The default value is 1, like on the figure 3.1.

The same macros are provided for images in the magins and wide images, respectively shown in figures 3.2 and 3.3.

```
% figure in the margin
\marginfig[<optional width>]{<file path>}{<caption>}{<label>}
% wide figure
\widefig[<optional width>]{<file path>}{<caption>}{<label>}
```

If for any reason a figure caption has to be put in the main text block, just use the regular `figure` environment. The following shortcut macros will also do. The result of `\plainfig` is shown in figure 3.4.

```
% plain figure with textwidth
\plainfig[<optional width>]{<file path>}{<caption>}{<label>}
% plain figure with full width
\plainwidefig[<optional width>]{<file path>}{<caption>}{<label>}
```

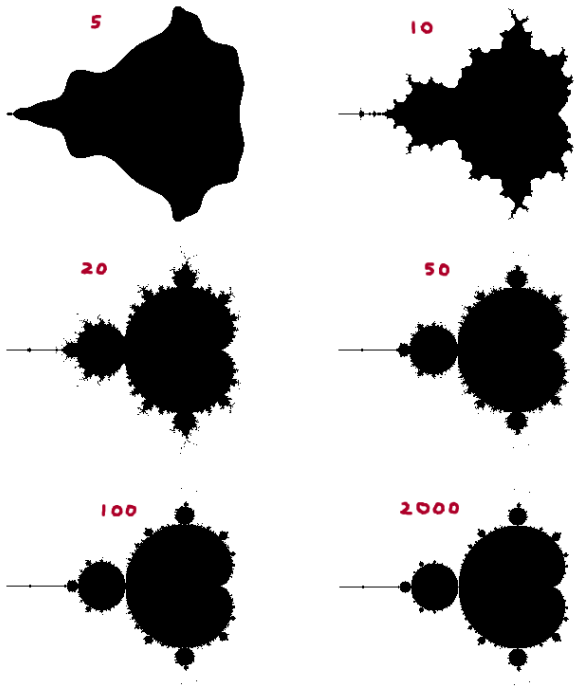

Figure 3.4. The Mandelbrot set with different depths of iteration. This caption is not in the margin but in the main text area. It can sometimes be useful with really really long captions. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Tables

Table environments work the same as figures, as is is shown in tables 3.1 and 3.2.

The Standard model of Elementary Particles.

Three generations of matter (fermions)			**Interactions (bosons)**	
I	II	III		
	QUARKS		GAUGE	SCALAR
u up	**c** charm	**t** top	**g** gluon	**H** higgs
d down	**s** strange	**b** bottom	**γ** photon	
	LEPTONS		**Z** boson	
e electron	**μ** muon	**τ** tau	**W** boson	
ν_e el. neutrino	ν_μ mu. neutrino	ν_τ tau neutrino		

Table 3.1. The elementary particles included in the standard model. This is a table with a `\sidecaption`.

Table des marées au port de Douarnenez (Finistère).

	Ven. 23 juillet 2021			**Sam. 24 juillet 2021**				**Dim. 25 juillet 2021**			**Lun. 26 juillet 2021**		
	heure	hauteur	coef.	heure	hauteur	coef.		heure	hauteur	coef.	heure	hauteur	coef.
BM	04:54	6.06	81	05:46	6.24	88	PM	00:21	0.92	–	01:08	0.88	–
PM	11:05	1.38	–	11:55	1.19	–	BM	06:34	6.34	92	07:19	6.33	92
BM	17:17	6.39	85	18:06	6.59	91	PM	12:41	1.10	–	13:26	1.12	–
PM	23:33	1.10	–	—:—	–	–	BM	18:52	6.67	93	19:36	6.63	91

Table 3.2. Table des marées à Douarnenez du 23 au 26 juillet 2021, Service Hydrographique et Océanographique de la Marine, `maree.shom.fr`. This is a wide table, called with the `table*` environment. The caption is also a `\sidecaption {}`.

To typeset the table 3.1, use the following code, which is just a `table` environment with a `\sidecaption`. For table 3.2, use the `table*` environment with either `\sidecaption` or `\caption`. `\FloatBarrier` is there to make sure the floats appear in order.[7]

```
\begin{table}[!htb]\small
  \sidecaption{The elementary particles included in the standard
  ↪  model. This is a table with a \texttt{\textbackslash
  ↪  sidecaption}.\label{tab:table-text}}
  \begin{tabular}{lllll}
    \multicolumn{5}{l}{\textbf{The Standard model of Elementary
    ↪  Particles.}}\\
    \toprule
    \multicolumn{3}{l}{\textbf{Three generations of matter
    ↪  (fermions)}} & \multicolumn{2}{l}{\textbf{Interactions
    ↪  (bosons)}} \\
    I & II & III & & \\
    \multicolumn{3}{c}{\textsc{quarks}} & \textsc{gauge} &
    ↪  \textsc{scalar} \\
    \cmidrule(lr){1-3}\cmidrule(lr){4-4}\cmidrule(lr){5-5}
    \textbf{u}~~up & \textbf{c}~~charm & \textbf{t}~~top &
    ↪  \textbf{g}~~gluon & \textbf{H}~~higgs \\
```

7 `\FloatBarrier` works for all floating environments, including figures.

```
    \textbf{d}~~down & \textbf{s}~~strange & \textbf{b}~~bottom &
    ↪  \textbf{\textgamma}~~photon & \\
    \multicolumn{3}{c}{\textsc{leptons}} & \textbf{Z} boson  & \\
    \cmidrule(lr){1-3}
    \textbf{e}~~electron & \textbf{\textmu}~~muon &
    ↪  \textbf{\texttau}~~tau & \textbf{W} boson & \\
    \textbf{\textnu\textsubscript{e}}~~el. neutrino &
    ↪  \textbf{\textnu\textsubscript{\textmu}}~~mu. neutrino &
    ↪  \textbf{\textnu\textsubscript{\texttau}}~~tau neutrino &  &
    ↪  \\
    \bottomrule
  \end{tabular}
\end{table}
```

To produce tables in the margin like table 3.3, use the `margintable` environment like in the following.

Table 3.3. Major, minor and perfect music intervals. ST. stands for *semitones*. This table is in the margin.

ST.	Intervals
0	unison
1	minor second
2	major second
3	minor third
4	major third
5	perfect fourth
6	aug. 4th / dim. 5th
7	perfect fifth
8	minor sixth
9	major sixth
10	minor seventh
11	major seventh
12	octave

```
\begin{margintable}[]\small
  \caption{Major, minor and perfect music intervals. ST. stands for
  ↪  \textit{semitones}. This table is in the margin.
  ↪  \label{tab:table-margin}}
  \begin{tabular}{ll}
    \toprule
    \textbf{ST.} & \textbf{Intervals} \\
    \midrule
    0 & unison \\
    1 & minor second \\
    2 & major second \\
    3 & minor third \\
    4 & major third \\
    5 & perfect fourth \\
    6 & aug. 4\textsuperscript{th} / dim. 5\textsuperscript{th} \\
    7 & perfect fifth \\
    8 & minor sixth \\
    9 & major sixth \\
    10 & minor seventh \\
    11 & major seventh \\
    12 & octave \\
    \bottomrule
  \end{tabular}
\end{margintable}
```

Code

Code can be inserted, whether with simple code boxes or captioned snippets that look like the following.

```
int main(int argc, char *argv[]) {
  printf("Hello world!");
  return 0;
}
```

Listing 3.1. Hello world in C. This is a captioned code snippet.

The background is a light gray that helps make the code stick out just enough without distracting the eye too much. The code itself is syntax colored according to the used language. There are several environments for code boxes, explained below.

For a simple code box with neither line numbering nor caption, the macro environment is the following.

```
\begin{codebox}{<your language in lowercase>}
<
Your code. It can contain all special characters such as { } ( ) [ ]
↪  \ % (the percent mark here is grayed just because on this very
↪  code box the language is set on latex)
It break lines.
It will end only when reading the %\end{codebox} below.
>
\end{codebox}
```

This supports most of the classic languages. Here are some examples for the language option:

`c`,
`c++`,
`python`,
`java`,
`latex`…

If a specific language is not recognized, use the `text` option instead: it will display the code without syntax coloring.

For a code box *with* line numbering –still without a caption– use the following environment.

```
\begin{codeboxnum}{<your language in lowercase>}
<your code>
\end{codeboxnum}
```

For captioned code snippets, the same environments exist, as shown as follows. For example, the listings 3.1 and 3.2 are respectively unnumbered and numbered code snippets.

```
\begin{snippet}{<language>}{<caption>}{<label>}
This code will be displayed in a captioned code box, without line
↪  numbering.
\end{snippet}

\begin{snippetnum}{<language>}{<caption>}{<label>}
```

```
This code will be displayed in a captioned code box, with line
↪  numbering.
\end{snippetnum}
```

Small pieces of code can be useful to put in flow of the text. This class provides a command to things like this: `public int size() {}`. Use the following to insert a piece of code in the text.

If the piece of code inside the `\inlinecode` contains curly braces, use another character to delimit your code, the same at beginning and end. Underscore (_) and pipe (|) will do fine.

```
\inlinecode{<language>}{<your code>}
% if there are curly braces in your code
\inlinecode{<language>}_<your code>_ % or
\inlinecode{<language>}|<your code>|
```

`\inlinecode` does not break at lines, so be careful, it can sometimes protrude on the right margin. If it is the case, go to a new line by inserting `\\` just before `\inlinecode`.

The following chunk is an example snippet to show the look when the code is a bit heftier. See how the box breaks at the end of the page.

Listing 3.2. A source code snippet of `29jm`'s stunningly amazing `SnowflakeOS`. This is a numbered code snippet that goes through several pages.

```
#include <kernel/multiboot2.h>
#include <kernel/sys.h>

static const char* tag_table[] = {
  "TAG_END",
  "TAG_CMDLINE",
  "<unknown>",
  "TAG_MODULE",
  "TAG_MEM",
  "TAG_BOOTDEV",
  "TAG_MEMMAP",
  "TAG_VBE",
  "TAG_FB",
  "<unknown>",
  "TAG_APM",
  "<unknown>",
  "<unknown>",
  "<unknown>",
  "TAG_RSDP1",
  "TAG_RSDP2",
};

/* Prints the multiboot2 tags given by the bootloader.
*/
void mb2_print_tags(mb2_t* boot) {
  if (boot->total_size <= sizeof(mb2_t)) {
    printke("no tags given");
    return;
  }

```

```
  mb2_tag_t* tag = boot->tags;
  mb2_tag_t* prev_tag = tag;

  do {
    const char* tag_name;

    if (tag->type < sizeof(tag_table) / sizeof(tag_table[0])) {
      tag_name = tag_table[tag->type];
    } else {
      tag_name = "<unknown>";
    }

    printk("%12s (%2d): %d bytes", tag_name, tag->type, tag->size);

    prev_tag = tag;
    tag = (mb2_tag_t*) ((uintptr_t) tag + align_to(tag->size, 8));
  } while (prev_tag->type != MB2_TAG_END);
}

/* Returns the first multiboot2 tag of the requested type.
*/
mb2_tag_t* mb2_find_tag(mb2_t* boot, uint32_t tag_type) {
  mb2_tag_t* tag = boot->tags;
  mb2_tag_t* prev_tag = tag;

  do {
    if (tag->type == tag_type) {
      return tag;
    }

    prev_tag = tag;
    tag = (mb2_tag_t*) ((uintptr_t) tag + align_to(tag->size, 8));
  } while (prev_tag->type != MB2_TAG_END);

  return NULL;
}
```

3.5 *The titlepage*

3.6 *Compilation*

3.7 *Packages loaded*

TODO #3

faire la liste des packages par exemple

PART II

SHOWCASE

4 *Showcase1*

5 *Showcase2*

APPENDIX

A *Some additional stuff*

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

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facilisis. Morbi fringilla, wisi in dignissim interdum, justo lectus sagittis dui, et vehicula libero dui cursus dui. Mauris tempor ligula sed lacus. Duis cursus enim ut augue. Cras ac magna. Cras nulla. Nulla egestas. Curabitur a leo. Quisque egestas wisi eget nunc. Nam feugiat lacus vel est. Curabitur consectetuer.

Suspendisse vel felis. Ut lorem lorem, interdum eu, tincidunt sit amet, laoreet vitae, arcu. Aenean faucibus pede eu ante. Praesent enim elit, rutrum at, molestie non, nonummy vel, nisl. Ut lectus eros, malesuada sit amet, fermentum eu, sodales cursus, magna. Donec eu purus. Quisque vehicula, urna sed ultricies auctor, pede lorem egestas dui, et convallis elit erat sed nulla. Donec luctus. Curabitur et nunc. Aliquam dolor odio, commodo pretium, ultricies non, pharetra in, velit. Integer arcu est, nonummy in, fermentum faucibus, egestas vel, odio.

Sed commodo posuere pede. Mauris ut est. Ut quis purus. Sed ac odio. Sed vehicula hendrerit sem. Duis non odio. Morbi ut dui. Sed accumsan risus eget odio. In hac habitasse platea dictumst. Pellentesque non elit. Fusce sed justo eu urna porta tincidunt. Mauris felis odio, sollicitudin sed, volutpat a, ornare ac, erat. Morbi quis dolor. Donec pellentesque, erat ac sagittis semper, nunc dui lobortis purus, quis congue purus metus ultricies tellus. Proin et quam. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos. Praesent sapien turpis, fermentum vel, eleifend faucibus, vehicula eu, lacus.[5]

B *Another chunk of maybe completely pointless content*

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Feel free to contribute!