# On how to document your work

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December, 2023

# Plan

1 Introduction

2 Tools

3 LaTeX: edit and compile

4 Learning path

5 Advantages and drawbacks

6 References

# Introduction

## Why

- Document your work **well** ?

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## Why

- Document your work **well** ?
- **Take the time** to document well your work ?

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## Why

- Document your work **well** ?
- **Take the time** to document well your work ?

- Do not loose your work.
- Re-think carefully about the problem.
- Re-check the methods and results.
- Re-run computations.

# Introduction

## Why

- Document your work **well** ?
- **Take the time** to document well your work ?

- Do not loose your work.
- Re-think carefully about the problem.
- Re-check the methods and results.
- Re-run computations.
- **Sometimes someone reads the doc...**

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# Tools

- Word.
- Powerpoint.
- Markdown.
- LaTeX.
- ...

# Tools

- Word. **Low effort**
- Powerpoint. **Low effort**
- Markdown. **Medium**
- LaTeX. **High**

## Prerequisites

- Word - Powerpoint: no need to compile.
- Markdown: Markdown editor.
- LaTeX: Tex editor and compilation.

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# Editors

LaTeX editors:

- TeXmaker.
- Kile.
- TeXstudio.
- TeXnicCenter.
- LyX.
- TeXworks.
- Overleaf.

# Editors

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- TeXmaker.
- Kile.
- TeXstudio.
- TeXnicCenter.
- LyX.
- TeXworks.
- Overleaf (**online**) ⇒ please try your first LaTeX document !!

# Compilation

## Compilation

- in command line:
  - latex myfile.tex myfile.dvi
  - dvipdf myfile.dvi myfile.pdf
  - dvips myfile.dvi myfile.ps
  - ps2pdf myfile.ps myfile.pdf

# Compilation

## Compilation

- in command line:
  - latex monfichier.tex $\Rightarrow$ compile .tex to DVI format.
  - dvipdf monfichier.dvi $\Rightarrow$ convert .dvi to PDF format.
  - dvips monfichier.dvi $\Rightarrow$ convert .dvi to PS format.
  - ps2pdf monfichier.ps $\Rightarrow$ convert .ps to PDF format.

# Compilation

## Compilation

- in command line:
  - latex monfichier.tex $\Rightarrow$ compile .tex to DVI format.
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  - ps2pdf monfichier.ps $\Rightarrow$ convert .ps to PDF format.
- button-click on **Compile**.

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- Lists and tables
- Structured document
- Librairies

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# My first piece of LaTeX

```
\documentclass[12pt]{article}
\usepackage{graphicx}
\usepackage{amsmath}

\title{My first LaTeX document}
\author{Your name}
\date{December 2023}

\begin{document}
\maketitle

We have now added \textbf{title}, author and date
to our \underline{first} \LaTeX{} document!

\end{document}
```

# My first LaTeX document

Your name

October 2023

We have now added **title**, author and date to our first LaTeX document!

# Equations

```
$$\displaystyle{
        \lim_{h \rightarrow 0} \dfrac{f(x+h)-f(x)}{h}
}$$

\begin{equation*}
  \left\{
      \begin{aligned}
        2x & -4\sqrt{x^2+1} & = & \quad \Omega \\
        & \sum_{i=0}^{n=+\infty} i + \pi & = & \, \Delta\\
        \exp^{3 x} & -5\,\int^a_b \frac{1}{\epsilonx^3 & = &
        \,\phi\\
      \end{aligned}
    \right.
\end{equation*}
```

# Equations

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$$\displaystyle{
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        \,\phi\\
      \end{aligned}
    \right.
\end{equation*}
```

$$\lim_{h \rightarrow 0} \frac{f(x+h)-f(x)}{h}$$

$$\begin{cases} 2x - 4\sqrt{x^2+1} & = \quad \Omega \\ \sum_{i=0}^{n=+\infty} i + \pi & = \Delta \\ \exp^{3x} - 5 \int_b^a \frac{1}{\epsilon} x^3 & = \phi \end{cases}$$

# Figures

```
\begin{figure}[!h]
\begin{center}
\includegraphics[scale=0.2]{figure.jpg}
\caption{La l\'egende d\'etaill\'ee de la figure.}
\end{center}
\end{figure}
```

# Figures

```
\begin{figure}[!h]
\begin{center}
\includegraphics[scale=0.2]{figure.jpg}
\caption{La l\'egende d\'etaill\'ee de la figure.}
\end{center}
\end{figure}
```

Figure 1: La légende détaillée de la figure.

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# Lists

```
\begin{itemize}
  \item The first item of the list.
  \item The second item.
\end{itemize}
```

- The first item of the list.
- The second item.

# Lists

```
\begin{itemize}
  \item The first item of the list.
  \item The second item.
\end{itemize}
```

- The first item of the list.
- The second item.

```
\begin{enumerate}
  \item The first item is numbered as one.
  \item The second is numbered as two, and so on...
\end{enumerate}
```

1. The first item is numbered as one.
2. The second is numbered as two, and so on...

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\begin{itemize}
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1. The first item is numbered as one.
2. The second is numbered as two, and so on...

## Customization

```
\item[\checkmark]
\item[$\circ$]
```

✓
○

# Tables

```
\begin{tabular}{||c  c  |c|}
 \hline
 Col1 & Col2 & Col2\\ [0.5ex]
 \hline\hline
 $\prod$ & 6 & \textcolor{blue}{A}\\
 \hline
 \hline
 \$looparrowleft$ & 7 & $\neq$\\
 \hline
 5 & $\blacktriangleleft$ & 8\\ [3ex]
 \hline
\end{tabular}
```

| Col1 | Col2 | Col2 |
|---|---|---|
| $\prod$ | 6 | A |
| $\hookleftarrow$ | 7 | $\neq$ |
| 5 | ◀ | 8 |

# Tables

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\begin{tabular}{||c c |c|}
 \hline
 Col1 & Col2 & Col2\\ [0.5ex]
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 $\prod$ & 6 & \textcolor{blue}{A}\\
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 \hline
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 \hline
 5 & $\blacktriangleleft$ & 8\\ [3ex]
 \hline
\end{tabular}
```

| Col1 | Col2 | Col2 |
|---|---|---|
| $\prod$ | 6 | A |
| $\hookleftarrow$ | 7 | $\neq$ |
| 5 | ◀ | 8 |

## Separators

& and \\

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# Sections

```
\begin{section}{My first section}
\begin{subsection}{First subsection}
\begin{subsubsection}{With a subsubection}
\end{subsubsection}
\end{subsection}

\begin{subsection}{And a second subsection}
\end{subsection}
\end{section}

\begin{section}{My second section}
\end{section}
```

1 My first section

1.1 First subsection

1.1.1 With a subsubection

1.2 And a second subsection

2 My second section

# Table of contents

```
\begin{document}
\tableofcontents
\begin{section}
...
\end{document}
```

```
\begin{document}
\tableofcontents
\begin{section}
...
\end{document}
```

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2.2 Agrégations . . . 4

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3.2 Durées de relation négatives . . . 7

3.3 Corrélations . . . 7

3.4 Valeurs abérrantes . . . 9

3.5 Nombre de nulls par ligne . . . 10

3.6 Equilibre des données . . . 10

# References

```
\begin{document}

Instead of WYSIWYG editors, typesetting systems like \TeX{} or \LaTeX
\cite{lamport94} can be used.
All \LaTeX{} packages can be found on \cite{greenwade93}.

\begin{thebibliography}{9}
\bibitem{lamport94}
  Leslie Lamport,
  \textit{\LaTeX: a document preparation system},
  Addison Wesley, Massachusetts,
  2nd edition,
  1994.
\bibitem{greenwade93}
  George D. Greenwade,
  \textit{The {C}omprehensive {T}ex {A}rchive {N}etwork ({CTAN})},
  TUGBoat,
  342--351,
  Vol 14,
  1993.
\end{thebibliography}

\end{document}
```

Instead of WYSIWYG editors, typesetting systems like TEX or LATEX [1] can be used. All LATEX packages can be found on [2].

# References


[1] Leslie Lamport, *LATEX: a document preparation system*, Addison Wesley, Massachusetts, 2nd edition, 1994.

[2] George D. Greenwade, *The Comprehensive Tex Archive Network (CTAN)*, TUGBoat, 342–351, Vol 14, 1993.

# Document organization

## Split document in parts:

- use tag **input**:

  \input{**file**}

- **file**.tex in local folder,
- **file**.tex without any preambule.

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- use tag **input**:

  `\input{file}`

- **file**.tex in local folder,
- **file**.tex without any preambule.

```
\begin{document}

\input{chapter1}
\input{chapter2}

\end{document}
```

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- amsrefs, hyperref $\Rightarrow$ add references with links.
- pifont $\Rightarrow$ fancy fonts.
- color, xcolor, colortbl.
- mathenv, amsmath.
- bm, bbm $\Rightarrow$ bold math symbols.
- beamerthemesplit.
- graphicx, graphics.
- tikz $\Rightarrow$ draw your own figure.
- pstricks $\Rightarrow$ print on figure.
- listings $\Rightarrow$ insert code.
- pdfpages $\Rightarrow$ insert pdf document.

**CTAN**

The Comprehensive TEX Archive Network **https://www.ctan.org**

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# Advantages and drawbacks

## Cons

- Not user friendly.
- Time consuming.
- Debugging.

## Pros

- Prettier (resume...).
- Automatic labelling, refering.
- Everything is possible !

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# References

- CTAN - `https://www.ctan.org`
- Overleaf - `https://fr.overleaf.com/project`
- TeXmaker - `https://www.xm1math.net/texmaker/`
- Learn LaTeX - `https://www.learnlatex.org/en/`
- Templates CV - `https://www.latextemplates.com/cat/curricula-vitae`
- Cheat Sheet - `http://www.utc.fr/~jlaforet/Suppl/latex-cheatsheet.pdf`

```
\usepackage{tikz}

\begin{tikzfadingfrompicture}[name=tikz]
\node[text=transparent!20]{
        \fontfamily{ptm}\fontsize{70}{70}
        \bfseries\selectfont
        Thanks !
};
\end{tikzfadingfrompicture}

\begin{tikzpicture}
\shade[path fading=tikz,
            fit fading=false,
            top color=yellow!60!orange,
            bottom color=magenta]
            (-6,-1) rectangle (5,1);
\end{tikzpicture}
```