

ΛT_EX & Friends:
Um Software Livre Clássico

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O Saber a gente Aprende com os Mestres e os Livros
A Sabedoria se Aprende com o Povo e os Humildes
Cora Coralina



Introdução

- WYSIWYG: What You See Is What You Get
- T_EX: Donald E. Knuth
- L^AT_EX: Leslie Lamport
- HTML: HyperText Markup Language
Para Monitor
- L^AT_EX: Impresso
- Beautiful (Scientific) Documents
- Beamer: These Slides...
- Comprehensive TeX Archive Network:
<http://www.ctan.org>

Layout Simply Superior...

Instalação

- Necessário:
 - \LaTeX
 - Editor: Kile, TexMaker, (WinEdt), ...
- Ruindows: MikTeX, <http://miktex.org/>
- Mac MacTeX, <http://www.tug.org/mactex/>
- Linux:
 - tex-live, <http://www.tug.org/texlive/>
 - Simply install Kile or TexMaker via package manager

However, **Be Warned:**

You'll never want to use not even Libreoffice again...

Hello

- LatexDoc Structure:
 - Preamble (Header)
 - Document Body
 - Postamble
- First Doc:

```
\documentclass{article}
\title{I'm only the Piano Player...}
\author{Jane Doe}
\date{September 1994}
\begin{document} %%end preamble
  \maketitle
  Hello Leslie Lamport, thank You very much!
\end{document} %%postamble
```

- [Slides/Docs/Hello.Doc.pdf](#) -
[Slides/Docs/Hello.Doc.tex](#)
`\url{Slides/Docs/Hello.Doc.pdf}`

Formatação Básica:

- Underline:

```
\underline{Underline:}
```

- **Bold:**

```
\textbf{Bold:}
```

- *Italic:*

```
\textit{Italic:}
```

- Type writer:

```
\texttt{Type writer:}
```

- Command:

```
\command[optionalargs]{compulsoryargs}
```

Text Size:

- `\tiny{tiny}`
`\scriptsize{scriptsize}`
`\small{small}`
`\normalsize{normalsize}`
`\footnotesize{footnotesize}`
`\large{large}`
`\Large{Large}`
`\LARGE{LARGE}`
`\huge{huge}`
`\Huge{Huge}`
- tiny scriptsize small normalsize footnotesize large Large
LARGE huge Huge

Alignment: Default Justified (Environments)

- **Left:**

```
\begin{flushleft}
  O dia que bosta vale ouro
\end{flushleft}
```

- **Center:**

```
\begin{center}
  Os pobres todos nascerão sem cu...
\end{center}
```

- **Right:**

```
\begin{flushright}
  Liberdade: Qualidade de Vida
\end{flushright}
```

- **Environment:**

```
\begin[optionals]{env}
  ...
\end{env}
```

Lists, Unnumbered: itemize

- - As I'm cocooned up into my badlands
 - Estou cheio de me sentir vazil

```
\begin{itemize}
  \item[-]
  {
    As I'm cocooned up into
    my badlands
  }
  \item[$\bullet$] Estou cheio de me sen
\end{itemize}
```


Lists, Numbered: enumerate

1. Yes I am a Mother Nature Son

I And I'm the only one

II I do what I want

2. And I want what I see

a Could only happen to me

b I'm so freeeeee

```
\begin{enumerate}
```

```
\item Yes I am a Mother Nature Son\\
```

```
\begin{enumerate}[I]
```

```
\item And I'm the only one
```

```
\item I do what I want
```

```
\end{enumerate}
```

```
\item And I want what I see\\
```

```
\begin{enumerate}[a]
```

```
\item Could only happen to me
```

```
\item I'm so freeeeee
```

```
\end{enumerate}
```

```
\end{enumerate}
```

Tables: tabular

-

left	right	center	fixed width
l	r	c	fw: 4cm

```

\begin{tabular}{l||r|c|p{4cm}||}
  left & right & center & fixed width\\
\hline
  l & r & c & fw\\
\end{tabular}

```

Document Types:

- **Letter:**

```
\documentclass[letterpaper,10pt]{letter}
```

- **Article:**

```
\documentclass[letterpaper,10pt]{article}
```

- **Slides:**

```
\documentclass[18pt,handout,hyperref]{beamer}
```

- **Report:**

```
\documentclass[a4paper,landscape,10pt]{report}
```

- **Book:**

```
\documentclass[a4paper,twoside,10pt]{book}
```

- **Etc....**

MADE IN L^AT_EX

OLE PETER SMITH, IME, UFG: OLE@MAT.UFG.BR - [HTTP://WWW.IME.UFG.BR/DOCENTES/OLEPETER](http://www.ime.ufg.br/docentes/olepeter)



Document Structure:

- **Article, report, beamer:**

```
\section[short]{title},  
\subsection[short]{title},  
\subsubsection[short]{title}
```

- **Book:**

```
\chapter[short]{title}
```

- **Automatic numbering!**

Article, Sectioning:

- ```
\documentclass{article}
\begin{document}
 \tableofcontents
 \section[Short 1]{Long 1}
 \subsection[Sub1]{Subsection 1}
 \subsubsection[Subsub1]{Subsubsection 1}
 \section[Short 2]{Long 2}
 \subsection[Sub2]{Subsection 2}
 \subsubsection[Subsub2]{Subsubsection 2}
 \section[Short 3]{Long 3}
 \subsection[Sub3]{Subsection 3}
 \subsubsection[Subsub3]{Subsubsection 3}
\end{document}
```
- [Slides/Docs/Article.pdf](#) - [Slides/Docs/Article.tex](#)

## *Structuring Documents:*

- `\include{filename} %%% omit .tex!!`
- `\input{filename} %%% omit .tex!!`
- Structure Your writings!!!!

### **Directory Structure:**

- Intro.tex
- Cap1/Main.tex
  - Cap1/Sec1.tex
  - Cap1/Sec2/Main.tex
    - Cap1/Sec2/SubSec1.tex
    - Cap1/Sec2/SubSec2.tex
    - ...
- Cap2/Main.tex
  - Cap2/Sec1.tex
  - ...
- Comments: %

## *Headers and footers:*

- fancyhdr package:

```
\documentclass{report}
```

```
\usepackage{fancyhdr}
```

```
\lhead{lhead \thepage}
```

```
\chead{chead}
```

```
\rhead{rhead}
```

```
\lfoot{lfoot}
```

```
\cfoot{cfoot}
```

```
\rfoot{rfoot}
```

```
\pagestyle{fancy}
```

```
\begin{document}
```

```
 \LaTeX does not do what You \emph{think}
```

```
 it should do?
```

```
\end{document}
```

- [Slides/Docs/Fancyhdr.pdf](#) -  
[Slides/Docs/Fancyhdr.tex](#)

## *Accented Characters:*

- Danish/Norwegian: Æ, Ø, Å (æ, ø, å);  
`\AE, \O, \AA` (`\ae, \o, \aa`)
- Portuguese: á, ê, ã, ü, ç, À, Ç;  
`\'a, \^e, \~o, \^"u, \c{c}, \^A, \c{C}`
- Spanish: ñ, ¿, ¡;  
`\~n, ?\, !\``
- File Encoding:
  - ISO8859-1, deprecated  
`\usepackage[brazil]{babel}`  
`\usepackage[latin1]{inputenc}`
  - UTF8, recommended  
`\usepackage[utf8x]{inputenc}`  
`\usepackage[T1]{fontenc}`  
`\usepackage[brazilian]{babel}`

Abolish in the name of Internationalization!!!

Economia de Pensamento



## Formulas: $\LaTeX$ the Rolls Royce

- *mathmode* vs. *textmode*
- Inline formula:  $\int_0^{+\infty} x^n e^{-\alpha x} dx = \frac{n!}{\alpha^{n+1}}, \operatorname{Re}(\alpha) \in \mathbb{R}_+$

\$

```
\int_0^{+\infty}
```

```
x^n e^{-\alpha x} dx
```

```
=
```

```
\frac{n!}{\alpha^{n+1}},
```

```
~ \text{Re}(\alpha) % ~: add space
```

```
\in \mathbb{R}_+
```

\$

Treachury and treason - there's always an excuse for it  
But when I find a reason - I still can't get used to it...

Dire Straits

## *Formula, unnumbered*

- Unnumbered Formula:

$$\underline{\underline{\mathbf{M}}}(\theta) = \begin{pmatrix} \cos \theta & -\sin \theta \\ \sin \theta & \cos \theta \end{pmatrix}, \quad \left| \begin{array}{cc} \cos \theta & -\sin \theta \\ \sin \theta & \cos \theta \end{array} \right| = \cos^2 \theta + \sin^2 \theta$$

- ```
\[
                %% or \begin{displaymath}
    \underline{\underline{\mathbf{M}}}(\theta) =
    \begin{pmatrix}
    \cos{\theta} & -\sin{\theta} \\
    \sin{\theta} & \cos{\theta}
    \end{pmatrix},
    \left| \begin{array}{rr}
    \cos{\theta} & -\sin{\theta} \\
    \sin{\theta} & \cos{\theta}
    \end{array} \right|
    =\cos^2{\theta}+\sin^2{\theta}
    \]
```

```
                %% or \end{displaymath}
```

Formulas, numbered

- Numbered Formula:

$$\underline{\mathbf{e}}(\theta) = \begin{bmatrix} \cos \theta \\ \sin \theta \end{bmatrix} \quad \underline{\mathbf{f}}(\theta) = \begin{Bmatrix} -\sin \theta \\ \cos \theta \end{Bmatrix} \quad (1)$$

- ```

\begin{equation}
 \underline{\mathbf{e}}(\theta) =
 \begin{bmatrix} \cos \theta \\ \sin \theta \end{bmatrix}
 \quad
 \underline{\mathbf{f}}(\theta) =
 \begin{Bmatrix} -\sin \theta \\ \cos \theta \end{Bmatrix}
\end{equation}

```

## Defining Commands

- **Vector: v - or **v**?** Vector command. In preamble:

```
\newcommand{\Vector}[1]
{
 \underline{\mathbf{#1}}
}
\begin{document}
...
$\Vector{v}=...$
\end{document}
```

- **Matrix: A - or **A**?** Matrix command:

```
\newcommand{\Matrix}[1]
{
 \underline{\underline{\mathbf{#1}}}
}
```

- Change once - change all!

[Slides/Docs/Commands.pdf](#)

## Counters & Numbering

```
\newcounter{mycount}[within]
\setcounter{mycount}{3}
\addtocounter{mycount}{2}
\themycount
```

- ```
\newcounter{mycount}
\themycount....
\setcounter{mycount}{3}
\themycount...
\setcounter{mycount}{7}
\themycount..
\addtocounter{mycount}{-2}
\themycount
...
⇒ 0... 3... 7.. 5
```

Predefined Counters

- **Pagenumber:** `\Roman{page}=xxii`
- **Section:** `\thesection=4`
- **Subsection:** `\thesubsection=0`
- **Itemize:**

```
\theenumi, \Roman{enumiii},
\theenumii, \theenumiv
```

⇒ 2, II, 0, 0

- Equations - later...
- Theorems - later...
- My own counters:

```
\newcounter{ex} \theex %prints 0
```

Floating Bodies: Figures

- ```
\begin{figure}[p] %location, values: h(ead),t(top)
 \includegraphics{Icons/latex.png}
 \caption{\LaTeX}
\end{figure}
```



*Figura:*  $\text{\LaTeX}$

## Floating Bodies: Tables

- ```

\begin{table}[p] %location, values: h(ead),t(o)
  \begin{tabular}{|c|c}
    \hline
      1 & foo\\
      bar&foobar\\
    \hline
  \end{tabular}
  \caption{Extreereemly Interesting Table}
\end{table}

```

1	foo
bar	foobar

Tabela: Extreereemly Interesting Table

Example: Slides/Docs/Figures.pdf

```
\documentclass{report}
\usepackage{graphicx}
\begin{document}
  \listoffigures
  Everyone's going to be free...
  \begin{figure}[b]
    \scalebox{0.6}{\includegraphics{../Icons/latex.png}}
    \caption{\LaTeX}
  \end{figure}
  \newpage
  Somos todos condenados a liberdade... \emph{Sartre}.
  \begin{figure}[t]
    \begin{center}
      \scalebox{0.6}{\includegraphics{../Icons/latex.png}}
      \caption{\LaTeX ~again}
    \end{center}
  \end{figure}
\end{document}
```

Theorems

- Definitions, Theorems, Lemmas, Corollaries,...
- Examples, Comments, ...
- ```
\documentclass{article}
\newtheorem{Comment}{Coment\'}{ario}[section]
\begin{document}
\section{1a Se\c{c}\~ao}
 \begin{Comment}
 VAM!
 \end{Comment}
 \begin{Comment}
 But don't get pissed...
 \end{Comment}
\end{document}
```
- [Slides/Docs/Theorem.pdf](#)

# Cross References

- ```

\documentclass{article}
\begin{document}
  \section{First section}
  \section{Second section}
    \label{sec:Label1} %immediately after \section
    \subsection{Sec. 2.1}
    \label{subsec:Label21}
    \begin{equation}
      equation\label{MyEQ}
    \end{equation}
  \newpage
  \section{Third section}
    See section \ref{sec:Label1}, p. \pageref{sec:Label1}.
    See section \ref{subsec:Label21}, p. \pageref{subsec:Label21}.
    See equation \ref{eq:MyEQ} (rather \ref{MyEQ}!), p. \pageref{MyEQ}.
    This one should be invalid: \ref{invalid}, p. \pageref{invalid}!!!
\end{document}

```

- [Slides/Docs/CrossRef.pdf](#)
- Run \LaTeX thrice!!!

Index: makeindex

- ```
\documentclass{article}
\usepackage{makeidx}
\makeindex
\begin{document}
 \index{Vector}Vector
 \newpage
 \index{Matrix}Matrix
 \index{SubMatrix}Submatrix
 \printindex
\end{document}
```
- **L<sup>A</sup>T<sub>E</sub>X** creates `doc.idx`.
- Run `makeindex:makeindex doc.idx`.  
**Creates:** `doc.ind`, read by `pdflatex!`
- [Slides/Docs/Index.Doc.pdf](#) -  
[Slides/Docs/Index.Doc.tex](#)

## *Bibliographies: BIBTEX*

- Create .bib file:

```
@BOOK{leslie,
 AUTHOR = "Leslie Lamport",
 TITLE = "LaTeX - User's Guide and Reference Manual",
 PUBLISHER = {Addison-Wesley},
 YEAR = {2000}
}

@BOOK{goossen,
 AUTHOR = "Michel Goossens; Frank Mittelbach; Alexander Samarin",
 TITLE = "The LaTeX Companion",
 PUBLISHER = {Addison-Wesley},
 YEAR = {199}}
}

@BOOK{mittel,
 AUTHOR = "Michel Goossens; Sebastian Rahtz; Frank Mittelbach;",
 TITLE = "The LaTeX Graphics Companion",
 PUBLISHER = {Addison-Wesley},
 YEAR = {1998}
}
```

## *Bibliographies: BIBTEX*

- Put it in your latex doc:

```
\bibliography{Slides/Docs/smybib}{}
```

- Run `pdflatex mydoc` (creates `.aux`)
- Run `bibtex mydoc` (reads `.aux`, creates `.bbl`)
- Run `pdflatex mydoc` *twice!!*
- `Slides/Docs/Bibs.tex` - `Slides/Docs/Bibs.pdf`

Estes são meus Princípios.  
Se Você não Gosta deles, eu tenho Outros...  
*Groucho Marx*

Life *sure* is a Mystery to be Lived  
Not a Problem to be Solved  
Please Always Enjoy!

*Ole*

