

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);  
`Æ, \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: $\text{\LaTeX}$ 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:

$$\underline{\underline{\mathbf{M}}}(\theta) = \begin{pmatrix} \cos \theta & -\sin \theta \\ \sin \theta & \cos \theta \end{pmatrix}, \quad \begin{vmatrix} \cos \theta & -\sin \theta \\ \sin \theta & \cos \theta \end{vmatrix} = \cos^2 \theta + \sin^2 \theta$$

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

%% 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(
  \includegraphics{Icons/latex.png}
  \caption{\LaTeX}
\end{figure}
```



Figura: \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{1$^a$ 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  $\text{\LaTeX}$  thrice!!!

## *Index: makeindex*

- ```
\documentclass{article}  
\usepackage{makeidx}  
\makeindex  
\begin{document}  
  \index{Vector}Vector  
  \newpage  
  \index{Matrix}Matrix  
  \index{SubMatrix}Submatrix  
  \printindex  
\end{document}
```
- **L^AT_EX** 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: BIB_TE_X

- 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: BIB_TE_X

- 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