

L^AT_EX Workshop

Encontro Nacional de Estudantes de Informática

by Ricardo Sousa





Universidade do Porto
Faculdade de Engenharia
FEUP

Outline.

Introduction

Concepts

Installation

Maintenance

\LaTeX Documents

Graphical User Interface (GUI)

Creating Documents with \LaTeX

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What is \LaTeX ?

- ▶ \LaTeX is a typesetting system;
- ▶ Allows the production of scientific (and non-scientific) documents;
- ▶ High-quality results.

*Check references of this presentation for further information.

L^AT_EX in a nutshell.

Save following lines in a file named: minimal.tex

```
\documentclass{article}  
\begin{document}  
Small is beautiful.  
\end{document}
```

and then, on the command line (run twice at least):

```
$ pdflatex minimal  
...  
$ pdflatex minimal
```



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Installing L^AT_EX.

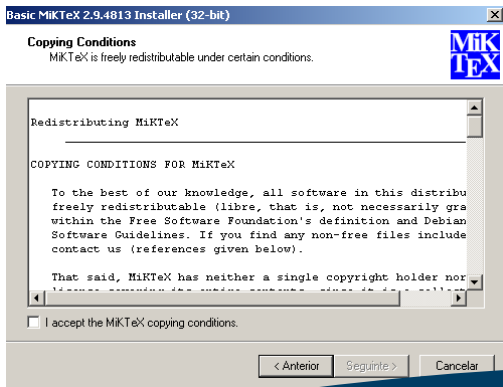
Figure: MiKTeX homepage.





Installing L^AT_EX.

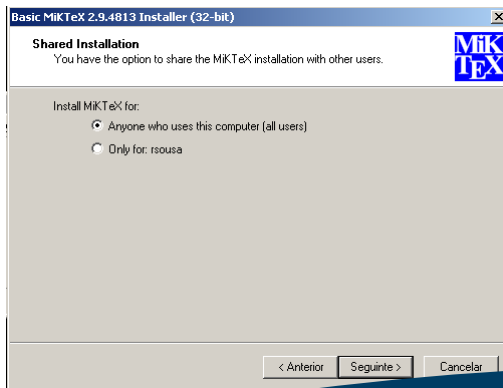
Figure: MiKTeX conditions.





Installing L^AT_EX.

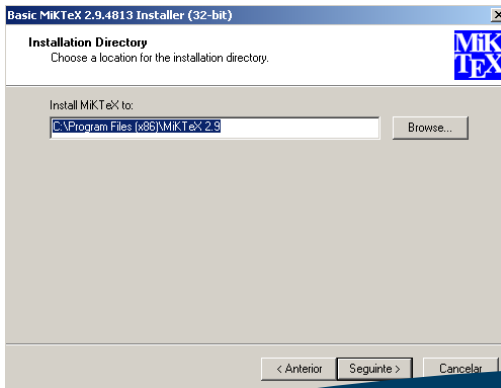
Figure: Standard configuration access profile.





Installing L^AT_EX.

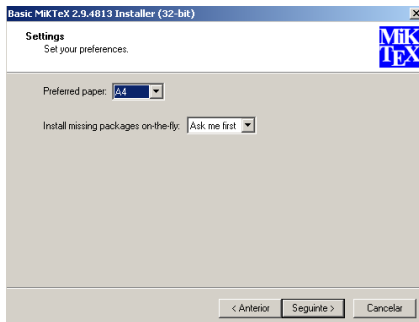
Figure: Installation directory.





Installing L^AT_EX.

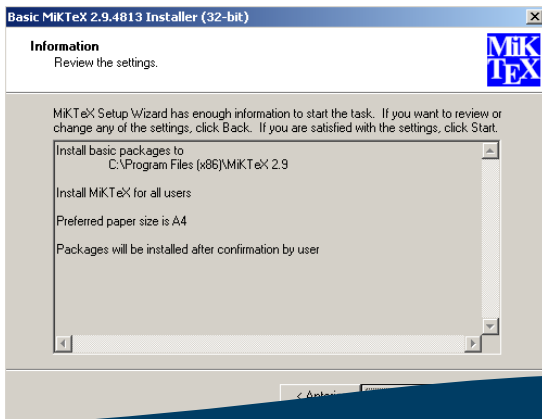
Figure: Some customizations (can be changed afterwards).





Installing L^AT_EX.

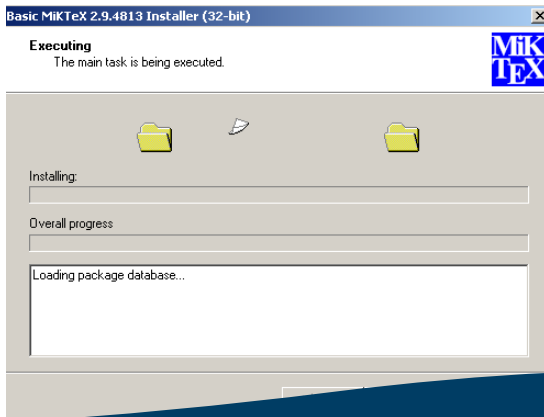
Figure: Review installation settings.





Installing L^AT_EX.

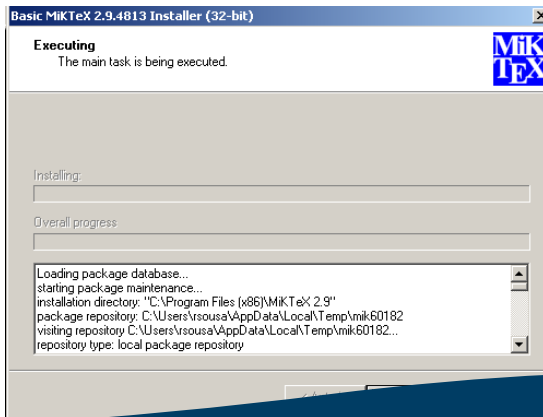
Figure: Installation (this may take a while).





Installing L^AT_EX.

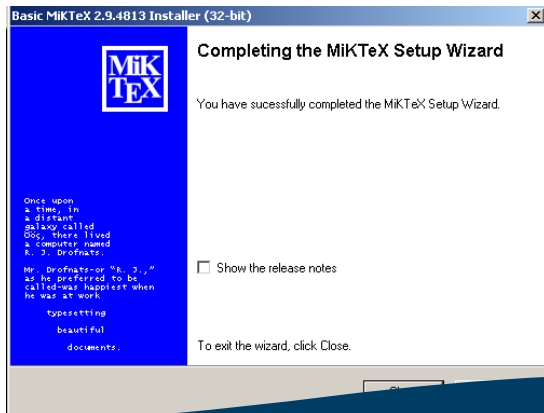
Figure: Installation (finished).





Installing L^AT_EX.

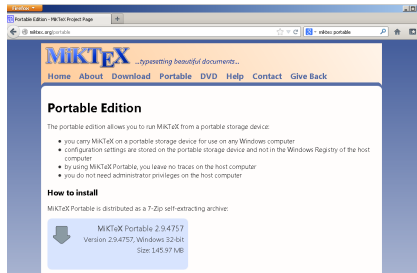
Figure: Installation finished.





Installing MiKTeX Portable.

Figure: MiKTeX Portable Homepage.





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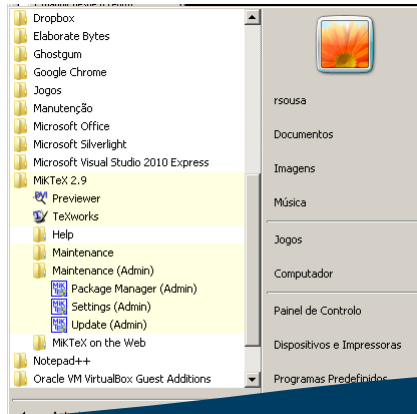
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Maintaining L^AT_EX Updated - Part I.



Maintaining L^AT_EX Updated - Part I.

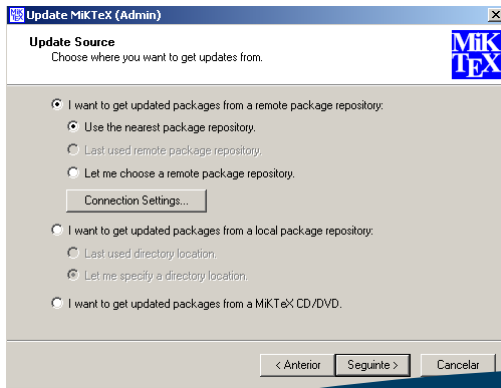
Figure: MiKTeX maintenance options (select update).





Maintaining L^AT_EX Updated - Part I.

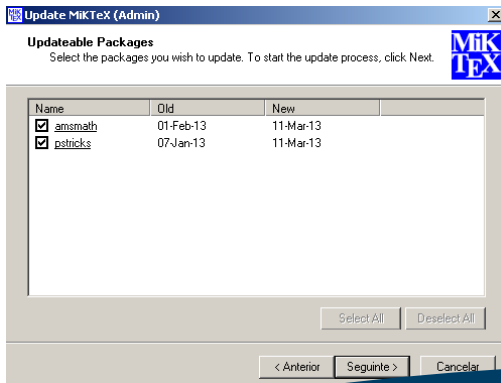
Figure: Select updates sources.





Maintaining L^AT_EX Updated - Part I.

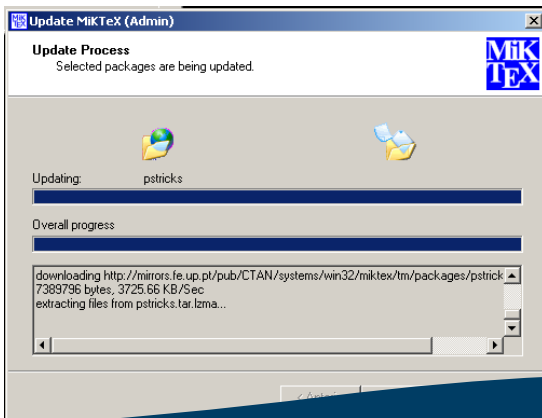
Figure: Example of packages to be updated.





Maintaining L^AT_EX Updated - Part I.

Figure: Update ongoing.





Maintaining L^AT_EX Updated - Part I.

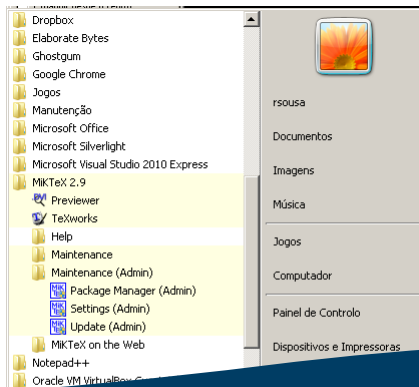
Figure: Update conclusion.





Maintaining L^AT_EX Updated - Part II.

Figure: MiKTeX maintenance options (select package manager).





Maintaining L^AT_EX Updated - Part II.

Figure: Packages listing.

LaTeX Package Manager (Admin)					
File Edit View Task Repository Help					
Name	Category	Size	Packaged on	Installed on	Title
library	(Format)LaTeXLaTeX contrib	490263	2011-07-15		Generating mathematical index sets
altpaper	(Format)LaTeXLaTeX contrib	230286	2004-02-13		Support for designing posters on large paper
article	(Format)LaTeXLaTeX contrib	137107	2011-01-07		"article" article layout
afonts	(Format)LaTeXLaTeX contrib	100456	2010-03-22		Support for all paper sizes
astex	(Format)LaTeXLaTeX contrib	2359094	2005-06-25		Macros for Manuscript Preparation for AAS Journals
abc	(Format)LaTeXLaTeX contrib	54141	2008-03-13		Support ABC music notation in LaTeX
abntex2	Unkategorisiert	421849	2013-02-25		Typeset technical and scientific Brazilian documents based on ABNT rules
abntex	Unkategorisiert	295734	2012-09-16		Automatic over-underbraces in math
abstract	(Format)LaTeXLaTeX contrib	189542	2009-09-03		Control the typesetting of the abstract environment
adstiles	Unkategorisiert	292402	2011-07-15		Adaptable BibTeX styles
adcfonts	Unkategorisiert	191608	2009-04-21		Utilities to derive new fonts from existing ones
achemso	(Format)LaTeXLaTeX contrib	730136	2012-03-08		Support for American Chemical Society journal submissions
acconfr	(Format)LaTeXLaTeX contrib	295936	2005-05-31		Class for ACM conference proceedings
acsc	Unkategorisiert	917579	2012-02-11		Typeset acronyms
acscifile	(Format)LaTeXLaTeX contrib	841373	2010-09-27		Create a graphics widget in a PDF file
acronymy	(Format)LaTeXLaTeX contrib	9594796	2012-01-02		Memory games in LaTeX
acronym	(Format)LaTeXLaTeX contrib	304028	2012-11-02		Expand acronyms at least once
acronost	(Format)LaTeXLaTeX contrib	434763	2013-01-02		Sort dead usage into order
acronem	(Format)LaTeXLaTeX contrib	101047	2010-11-24		Manage and index acronyms and terms
acronex	(Format)LaTeXLaTeX contrib	2959985	2012-07-11		The AcroTeX education bundle
active-conf	(Format)LaTeXLaTeX contrib	34464	2008-09-23		Class for typesetting ACTHE conference papers
actualexchange	Unkategorisiert	8044	2012-10-17		Symbol for use in "tensord" value statements of an ontology
addlines	(Format)LaTeXLaTeX contrib	15218	2008-09-19		A user-friendly wrapper around \enlargeheight
addfrees	(Format)LaTeXLaTeX contrib	200771	2011-09-01		Australian Defence Force Academy thesis format
adfont	(Format)LaTeXLaTeX contrib	417245	2010-10-07		Overlaid font with TeXLaTeX support
adfontsb	(Format)LaTeXLaTeX contrib	403299	2010-09-09		SymbolaTeX with TeXLaTeX support
adfontsb	(Format)LaTeXLaTeX contrib	321385	2012-02-01		Adjusting margins for multicol and single column output
adfontsb	(Format)LaTeXLaTeX contrib	895248	2012-09-29		Graphics package-able macros for "general" boxes
addbreakam	Unkategorisiert	975218	2012-06-11		Adobe Cmap font in LaTeX
addconv	Unkategorisiert	497328	2010-04-13		BibTeX styles to implement an address database
addfile	(Format)LaTeXLaTeX contrib	24007	2005-05-14		Using address lists in LaTeX
addfile	(Format)LaTeXLaTeX contrib	150287	2010-02-22		Print a date relative to "today"
adfont	(Format)LaTeXLaTeX contrib	506513	2007-07-05	2013-03-12	Virtual fonts for PDF files with T1 encoded CMap fonts
add-file	(Format)LaTeXLaTeX contrib	271424	2010-09-27		Multi-line links with hyperref
add-file	Unkategorisiert	885592	2012-07-11		Format PDF files for use on a smartphone



Maintaining L^AT_EX Updated - Part II.

Figure: Search for “ieee” package.

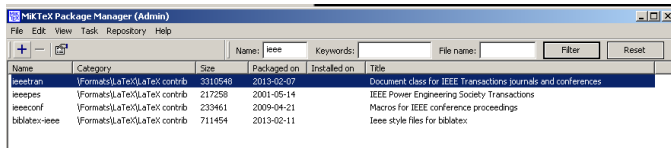
The screenshot shows the MikTeX Package Manager (Admin) window. The title bar reads "MikTeX Package Manager (Admin)". The menu bar includes "File", "Edit", "View", "Task", "Repository", and "Help". Below the menu bar is a toolbar with icons for adding, removing, and refreshing the package list. To the right of the toolbar are search fields: "Name:" with the text "ieee", "Keywords:", "File name:", and buttons for "Filter" and "Reset". Below these fields is a table with the following data:

Name	Category	Size	Packaged on	Installed on	Title
ieeetran	\Formats\LaTeX\LaTeX contrib	3310548	2013-02-07		Document class for IEEE Transactions journals and conferences
ieeepes	\Formats\LaTeX\LaTeX contrib	217258	2001-05-14		IEEE Power Engineering Society Transactions
ieeeconf	\Formats\LaTeX\LaTeX contrib	233461	2009-04-21		Macros for IEEE conference proceedings
biblatex-ieee	\Formats\LaTeX\LaTeX contrib	711454	2013-02-11		Ieee style files for biblatex



Maintaining L^AT_EX Updated - Part II.

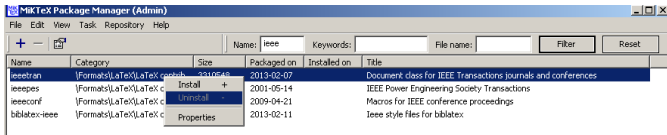
Figure: You can install by clicking in the “+” sign.





Maintaining L^AT_EX Updated - Part II.

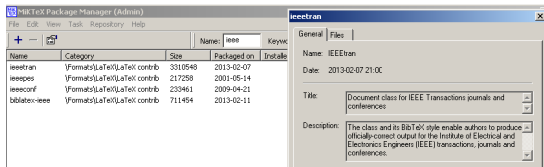
Figure: Or by pressing the right mouse button.





Maintaining L^AT_EX Updated - Part II.

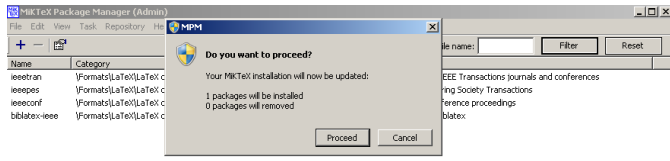
Figure: Package description.





Maintaining L^AT_EX Updated - Part II.

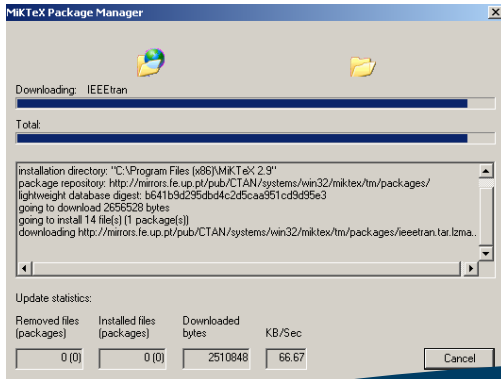
Figure: Installation confirmation box.





Maintaining L^AT_EX Updated - Part II.

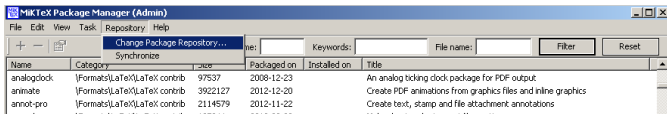
Figure: Installation.





Maintaining L^AT_EX Updated - Part II.

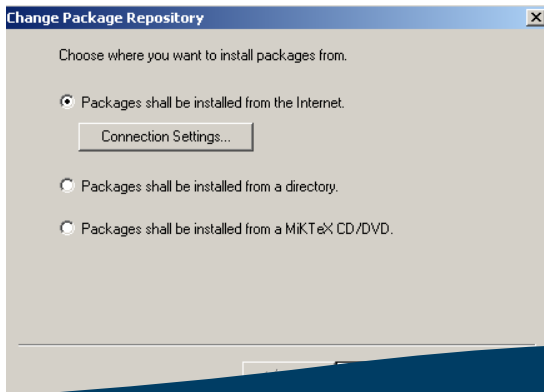
Figure: Changing package repository.





Maintaining L^AT_EX Updated - Part II.

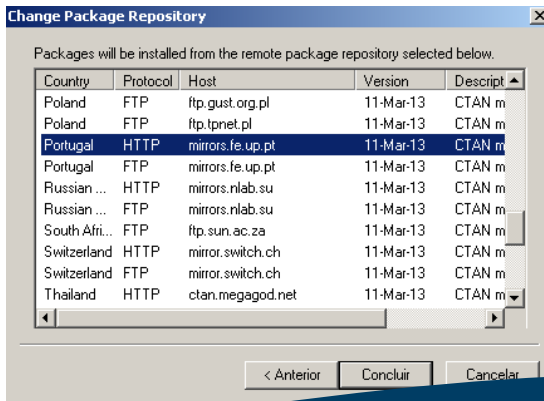
Figure: Select installation from internet for the most up to date packages.





Maintaining L^AT_EX Updated - Part II.

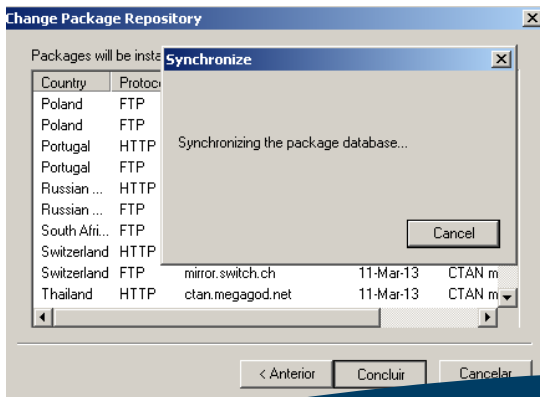
Figure: Select the closest one.





Maintaining L^AT_EX Updated - Part II.

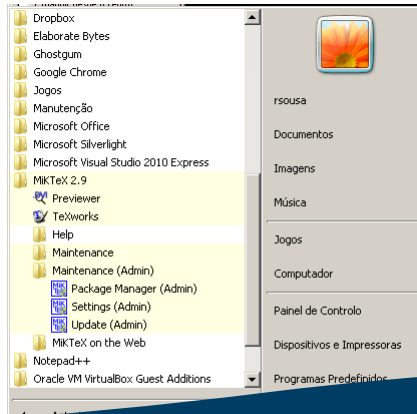
Figure: And let it synchronize.





Maintaining L^AT_EX Updated - Part III.

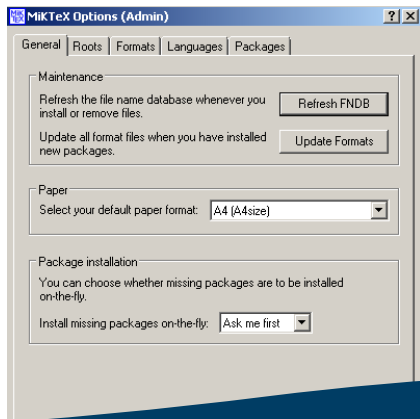
Figure: MiKTeX maintenance options (select settings).





Maintaining L^AT_EX Updated - Part III.

Figure: Change settings.





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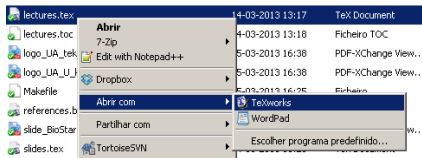
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User Interface: TeXworks

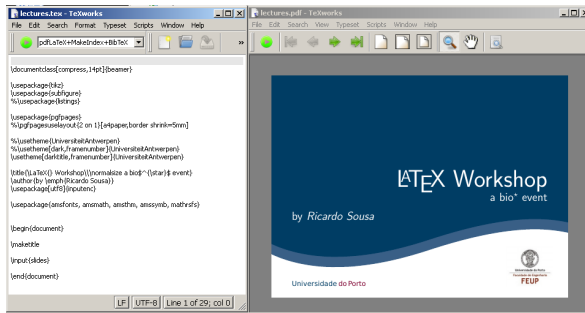
Figure: Right click on the main \LaTeX file and press “open with” TeXworks.





User Interface: TeXworks

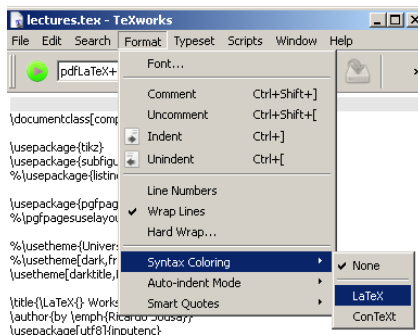
Figure: Expected result (for this presentation).





User Interface: TeXworks

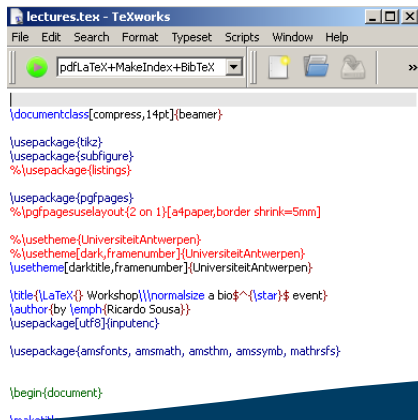
Figure: Syntax highlight.





User Interface: TeXworks

Figure: Expected result.



The screenshot shows the TeXworks application window. The title bar reads "lectures.tex - TeXworks". The menu bar includes "File", "Edit", "Search", "Format", "Typeset", "Scripts", "Window", and "Help". Below the menu bar is a toolbar with icons for opening, saving, and other file operations. The main text area contains LaTeX code for a Beamer presentation. The code is as follows:

```
\documentclass[compress,14pt]{beamer}

\usepackage{tikz}
\usepackage{subfigure}
%\usepackage{listings}

\usepackage{pgfpages}
%\pgfpagesuselayout{2 on 1}[a4paper,border shrink=5mm]

%\usetheme{UniversiteitAntwerpen}
%\usetheme[dark,framenumber]{UniversiteitAntwerpen}
\usetheme[darktitle,framenumber]{UniversiteitAntwerpen}

\title{\LaTeX{} Workshop\|\|normalsize a bio $\wedge$ \{star\}$ event}
\author{by \emph{Ricardo Sousa}}
\usepackage{utf8}{inputenc}

\usepackage{amsmaths, amsmath, amsthm, amssymb, mathrsfs}

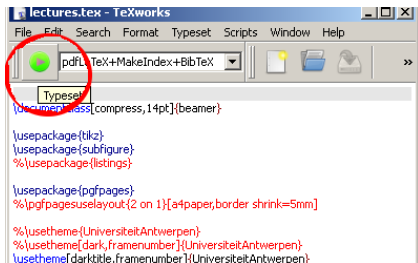
\begin{document}

\maketitle
```



TeXworks: Compiling.

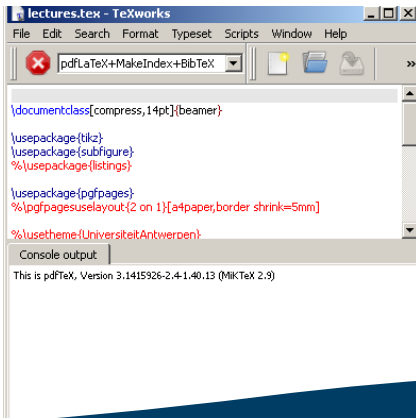
Figure: Compiling.





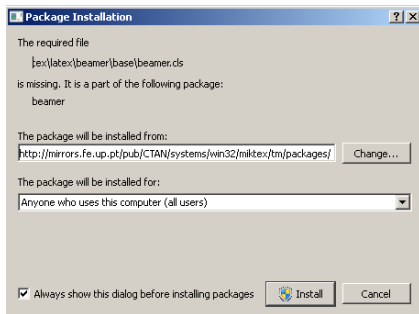
TeXworks: Compiling.

Figure: Console output.



TeXworks: Compiling.

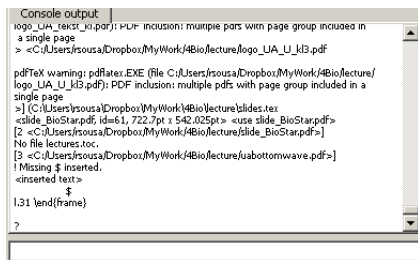
Figure: Pop-up window to install missing packages.





TeXworks: Compiling.

Figure: Compilation unsuccessful.



```
Console output
logo_UA_rekst_kl.por): PDF inclusion: multiple ports with page group included in
a single page
> <C:/Users/rsousa/Dropbox/MyWork/4Bio/lecture/logo_UA_U_kl3.pdf

pdfTeX warning: pdfLatex.EXE (file C:/Users/rsousa/Dropbox/MyWork/4Bio/lecture/
logo_UA_U_kl3.pdf): PDF inclusion: multiple pdfs with page group included in a
single page
>] (C:/Users/rsousa/Dropbox/MyWork/4Bio/lecture/slides.tex
<slide_BioStar.pdf, id=61, 722.7pt x 542.025pt> <use slide_BioStar.pdf>
[2 <C:/Users/rsousa/Dropbox/MyWork/4Bio/lecture/slide_BioStar.pdf>]
No file lectures.toc.
[3 <C:/Users/rsousa/Dropbox/MyWork/4Bio/lecture/uabottomwave.pdf>]
! Missing $ inserted.
<inserted text>
$
l.31 \end{frame}
?
```



Command line compilation.

Figure: Generating compile script.

 logo_UA_U_jsj.pdf	05-03-2013 16:58	PDF-XChange view...	74 KB
 Makefile	05-03-2013 16:25	Ficheiro	1 KB
 compile.bat	14-03-2013 13:33	Documento de texto	0 KB
 references.bib	05-03-2013 16:45	BibTeX Database	1 KB




Command line compilation.

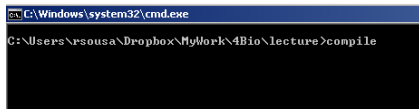
Figure: 3 main lines of code.

```
C:\Users\rsousa\Dropbox\MyWork\4Bio\lectur
File Edit Search View Encoding Language Settings
compile.bat
1 pdflatex lectures
2 pdflatex lectures
3 bibtex lectures
4 pdflatex lectures
```




Command line compilation.

Figure: Open a command line window



```
C:\Windows\system32\cmd.exe  
C:\Users\rsousa\Dropbox\MyWork\4Bio\lecture>compile
```



Command line compilation.

Figure: Pop-up window to install missing packages.

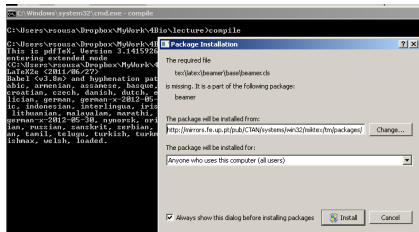




Figure: Compilation successful.

C:\Users\rsgouza\Dropbox\MyWork\4Bio\lecture>



Command line compilation.

Figure: Compilation unsuccessful.

```
pdfTeX warning: pdflatex <file C:/Users/rsousa/Dropbox/MyWork/4Bio/lecture/logo_u0_tekst_k1.pdf>: PDF inclusion: multiple pdfs with page group included in a single page
> C:/Users/rsousa/Dropbox/MyWork/4Bio/lecture/logo_u0_u_k13.pdf
pdfTeX warning: pdflatex <file C:/Users/rsousa/Dropbox/MyWork/4Bio/lecture/logo_u0_u_k13.pdf>: PDF inclusion: multiple pdfs with page group included in a single page
>] C:/Users/rsousa/Dropbox/MyWork/4Bio/lecture/slides.tex
<slide_BioStar.pdf, id=61, 722.7pt x 542.825pt> <use slide_BioStar.pdf>
[2 C:/Users/rsousa/Dropbox/MyWork/4Bio/lecture/slide_BioStar.pdf]
No file lectures.toc.
[3 C:/Users/rsousa/Dropbox/MyWork/4Bio/lecture/uabottomwave.pdf]
! Missing $ inserted.
<inserted text>
$
1.31 \end{frame}
?
```



Command line compilation.

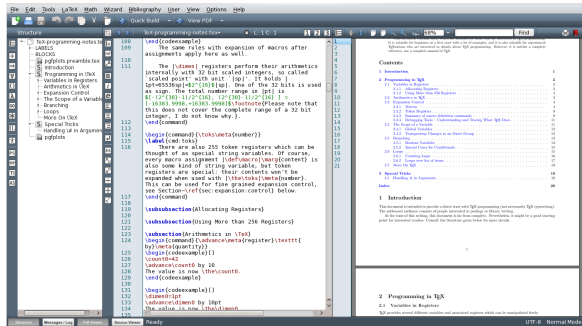
Figure: Good practice: erase those auxiliary files.

```
compile.bat
1 del /F *.log *.out *.bbl *.blg
2
3 pdflatex lectures
4 pdflatex lectures
5 bibtex lectures
6 pdflatex lectures
```



User Interface: Texmaker

Figure: Example.





User Interface: Texmaker

Figure: Code completion.

```
1 \section{The first section}  
2 \label{my label}  
3 Some stuff  
4 \subsection{A subsection}  
5 \re  
6 \ref{my label}  
7 \ref{.}  
8 \renewcommand{.}{.}  
  \renewenvironment{.}{.}{.}
```



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Creating my first L^AT_EX Manuscript

```
\documentclass{article}  
% preamble  
\begin{document}  
% core  
\end{document}
```



Creating my first L^AT_EX Manuscript

Typical structure for an a4 paper with font size of 10 points:

```
\documentclass[twoside,a4paper,10pt]{article}  
% preamble  
\begin{document}  
% core  
\end{document}
```



Creating my first L^AT_EX Manuscript

Font encoding:

```
\documentclass[twoside,a4paper,10pt]{article}  
% preamble  
\usepackage[utf8]{inputenc} % general input encodings  
\begin{document}  
% core  
\end{document}
```



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Creating my first L^AT_EX Manuscript

Portuguese support:

```
\documentclass[twoside,a4paper,10pt]{article}  
% preamble  
\usepackage[utf8]{inputenc} % general input encodings  
\usepackage[portuguese]{babel}  
\begin{document}  
% core  
\end{document}
```



Creating my first L^AT_EX Manuscript

Different packages at your disposal:

1. `\usepackage{graphicx}`: figures;
2. `\usepackage{subfig}`: when working with multiple figures;
3. `\usepackage{cite}`: citations;
4. `\usepackage{amsmath}`: mathematical features;
5. `\usepackage{amssymb}`: mathematical symbols;
6. and lots more ...

Check <http://www.ctan.org>.



Creating my first L^AT_EX Manuscript

Creating Lists:

The `itemize` environment is for simple lists, the `enumerate` environment for enumerated lists, and the `description` environment for descriptions.



Creating my first L^AT_EX Manuscript

Follows some examples:

```
\begin{enumerate}
\item You can mix the list environments to your taste:
  \begin{itemize}
    \item But it might start to look silly.
    \item[-] With a dash.
  \end{itemize}
\item Therefore remember:
\begin{description}
  \item[Stupid] things will not become smart because they are in a list.
  \item[Smart] things, though, can be presented beautifully in a list.
\end{description}
\end{enumerate}
```



Creating my first L^AT_EX Manuscript

Including a figure:

```
\documentclass[twoside,a4paper,10pt]{article}  
% preamble  
\usepackage[utf8]{inputenc} % general input encodings  
\usepackage{graphicx}  
  
\begin{document}  
\begin{figure}  
  \includegraphics{img.pdf}  
\end{figure}  
\end{document}
```




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`{\tiny A}`

`{\scriptsize A}`

`{\footnotesize A}`

`{\small A}`

`{\normalsize A}`

`{\large A}`

`{\Large A}`

`{\LARGE A}`

`{\huge A}`

`{\Huge A}`

A A A A A A A A A A



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Including a figure:

```
\documentclass[twoside,a4paper,10pt]{article}
% preamble
\usepackage[utf8]{inputenc} % general input encodings
\usepackage{graphicx}
\begin{document}

Logo.
\begin{figure}
  \includegraphics{img.pdf}
\end{figure}
End of document.
\end{document}
```

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Including a figure (Can you find the difference?):

```
\documentclass[twoside,a4paper,10pt]{article}
% preamble
\usepackage[utf8]{inputenc} % general input encodings
\usepackage{graphicx}
\begin{document}

Logo.
\begin{figure}[!h]
  \includegraphics{img.pdf}
\end{figure}
End of document.
\end{document}
```

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Including a figure (Can you find the difference?):

```
\documentclass[twoside,a4paper,10pt]{article}
% preamble
\usepackage[utf8]{inputenc} % general input encodings
\usepackage{graphicx}
\begin{document}

Logo.
\begin{figure}[!h] % <----- LOOK!!
  \includegraphics{img.pdf}
\end{figure}
End of document.
\end{document}
```



Floating Bodies.

How it affects the document?

- ▶ to place a figure/table right here (h);
- ▶ or at the bottom (b) of some page;
- ▶ or on a special floats page (p);
- ▶ and, all this even if it does not look that good (!)
- ▶ if no placement specifier is given: [tbp]

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To include figure between two paragraphs:

```
\documentclass[twoside,a4paper,10pt]{article}  
% preamble  
\usepackage[utf8]{inputenc} % general input encodings  
\usepackage{graphicx}  
\begin{document}
```

Logo.

```
\begin{figure}[!h]  
  \includegraphics{img.pdf}  
\end{figure}
```

End of document.

```
\end{document}
```

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Can we change the image size? Yes!

```
\documentclass[twoside,a4paper,10pt]{article}  
% preamble  
\usepackage[utf8]{inputenc} % general input encodings  
\usepackage{graphicx}  
\begin{document}
```

Logo.

```
\begin{figure}[!h]  
  \includegraphics[width=0.5\textwidth]{img.pdf}  
\end{figure}
```

End of document.

```
\end{document}
```



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Can we center the image? Of course!

```
\documentclass[twoside,a4paper,10pt]{article}
% preamble
\usepackage[utf8]{inputenc} % general input encodings
\usepackage{graphicx}
\begin{document}
```

Logo.

```
\begin{figure}[!h]
  \centering
  \includegraphics[width=0.5\textwidth]{img.pdf}
\end{figure}
```

End of document.

```
\end{document}
```




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Can we center the image? Another way!

```
\documentclass[twoside,a4paper,10pt]{article}
% preamble
\usepackage[utf8]{inputenc} % general input encodings
\usepackage{graphicx}
\begin{document}
```

Logo.

```
\begin{figure}[!h]
  \begin{center}
    \includegraphics[width=0.5\textwidth]{img.pdf}
  \end{center}
\end{figure}
```

End of document.

```
\end{document}
```



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And what about captions? Easy stuff :)

```
\begin{figure}[!h]
  \centering
  \includegraphics[width=0.5\textwidth]{img.pdf}
  \caption{Faculty Logo.}
\end{figure}
```



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Including more than one figure.

```
\begin{figure}[!h]  
  \centering  
  \includegraphics[width=0.5\textwidth]{img.pdf}  
  \includegraphics[width=0.5\textwidth]{img.pdf}  
  \caption{Faculty Logo.}  
\end{figure}
```



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However, we should use package ‘subfig’ which provides support for the inclusion of small, ‘sub’, figures and tables.

```
...  
\usepackage{subfig}  
\begin{document}  
...  
\begin{figure}[!h]  
\subfloat[Imagem 1.]{\includegraphics[width=0.5\textwidth]{img.pdf}}  
\subfloat[Imagem 2.]{\includegraphics[width=0.5\textwidth]{img.pdf}}  
\end{figure}
```



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How to create tables? The simplest way is:

```
\begin{tabular}{ccc}  
Evolutionary & SA & Simulated Annealing \\  
\end{tabular}
```

- ▶ *tabular* is the environment for tables;
- ▶ Triple “c” for three columns with centered (c) text;
- ▶ “&” is the column separator;
- ▶ \\ is the new line;



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How to create tables? The simplest way is:

```
\begin{tabular}{|p{3cm}|c|c|}  
Evolutionary & SA & Simulated Annealing \\  
\end{tabular}
```

- ▶ besides “c” we can have:
 - ▶ l: left;
 - ▶ r: right;
 - ▶ p{2cm}: paragraph with 2cm width.
- ▶ we can also stylish our table by putting bars |.|

Creating my first L^AT_EX Manuscript

How to create tables? The simplest way is:

```
\begin{tabular}{|p{3cm}|c|c|}  
\hline  
Evolutionary & ZO & Genetic Algorithm\\  
Evolutionary & SA & Simulated Annealing \\  
\hline  
\end{tabular}
```

adding horizontal lines with `\hline`



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Merging cells (rows).

```
\usepackage{multirow}
...
\begin{document}
\begin{tabular}{|p{3cm}|c|c|}
\hline
\multirow{2}{*}{Evolutionary} & ZO & Genetic Algorithm\\
& SA & Simulated Annealing \\
\hline
\end{tabular}
...
\end{document}
```




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Merging cells (columns).

```
\begin{tabular}{|p{3cm}|c|c|}  
\hline  
\multicolumn{3}{|c|}{Heuristic Algorithms} \\  
\hline  
\multirow{2}{*}{Evolutionary} & ZO & Genetic Algorithm\\  
                             & SA & Simulated Annealing \\  
\hline  
\end{tabular}
```



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```
\begin{table}[!t]
\begin{tabular}{|p{3cm}|c|c|}
\hline
\multicolumn{3}{|c|}{Heuristic Algorithms} \\
\hline
\multirow{2}{*}{Evolutionary} & ZO & Genetic Algorithm\\
& & SA & Simulated Annealing \\
\hline
\end{tabular}
\caption{Table of some Heuristic Algorithms.}
\end{table}
```



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How can we reference tables in the document?

```
\begin{table}[!t]
\begin{tabular}{|p{3cm}|c|c|}
\hline
\multicolumn{3}{|c|}{Heuristic Algorithms} \\
\hline
\multirow{2}{*}{Evolutionary} & ZO & Genetic Algorithm \\
& SA & Simulated Annealing \\
\hline
\end{tabular}
\caption{Table of some Heuristic Algorithms.}
\label{tab:table}
\end{table}
Please check Table~\ref{tab:table}.
```

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Can I divide my document by sections? Of course

```
\section{Introduction}  
...  
\section{State-of-the-Art}  
\subsection{Biology Concepts}  
...  
\subsection{Image Processing}  
...  
\subsection{Pattern Recognition}  
...
```



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References can be used anywhere.

```
\section{Introduction}  
\label{sec:intro}  
...  
\section{State-of-the-Art}  
\label{sec:soa}  
\subsection{Biology Concepts}  
\label{sec:bio}  
...  
\subsection{Image Processing}  
\label{sec:ip}  
...  
\subsection{Pattern Recognition}  
\label{sec:pr}  
...
```

Further image processing details can be found in Section~\ref{sec:ip}.



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Document can also be divided in parts, chapters and so on.

```
\documentclass[twoside,a4paper,10pt]{book}  
...  
\begin{document}  
\part{Basic Concepts: Part I}  
\chapter{Beginning}  
\section{How does it starts?}  
  
\part{Basic Concepts: Part II}  
\end{document}
```



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Title, authors..

```
\documentclass[twoside,a4paper,10pt]{book}
% preamble
\usepackage[utf8]{inputenc} % general input encodings
\usepackage{graphicx}
\usepackage{multirow}

\title{Book Sample}
\begin{document}
\tableofcontents % simple, isn't it?

\part{Basic Concepts: Part I}
\chapter{Beginning}
\section{How does it starts?}

\part{Basic Concepts: Part II}
\end{document}
```



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maketitle after the `\begin{document}`

```
\documentclass[twoside,a4paper,10pt]{book}
% preamble
\usepackage[utf8]{inputenc} % general input encodings
\usepackage{graphicx}
\usepackage{multirow}

\title{Book Sample}
\begin{document}
\maketitle % tells latex to put title here!
\tableofcontents % simple, isn't it?

\part{Basic Concepts: Part I}
\chapter{Beginning}
\section{How does it starts?}

\part{Basic Concepts: Part II}
\end{document}
```




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author and date

```
\title{Book Sample}  
\author{X and Y}  
\date{16/03/2013}  
\begin{document}  
\maketitle  
\tableofcontents % simple, isn't it?
```

It is also possible to specify current date through command `\date{\today}`



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Mathematical Formulas

```
\begin{equation}
```

```
e = mc^2
```

```
\label{eq:massenergy}
```

```
\end{equation}
```

Mass Energy Einstein equivalence formula (Eq.~\ref{eq:massenergy}).

- ▶ equation environment;
- ▶ \wedge is for superscript text.

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Mathematical Formulas (summations):

```
\begin{equation}  
1/N \sum_{i=1}^N x_i  
\end{equation}
```

- ▶ `_` is for subscript;
- ▶ `/` can be substituted by `\frac{1}{N}` (output result will be different, $\frac{1}{N}$).



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Symbols:

<code>\alpha</code>	<code>\theta</code>	<code>\tau</code>
<code>\beta</code>	<code>\vartheta</code>	<code>\pi</code>
<code>\gamma</code>	<code>\gamma</code>	<code>\varpi</code>

You do not need know them by heart. Check
<http://www.tex.ac.uk/tex-archive/info/symbols/comprehensive/symbols-a4.pdf>



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Symbols:

$$\alpha \qquad \theta \qquad \tau \qquad (1)$$

$$\beta \qquad \vartheta \qquad \pi \qquad (2)$$

$$\gamma \qquad \gamma \qquad \varpi \qquad (3)$$



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Mathematical Formulas (without numbering):

```
\begin{equation*}  
1/N \sum_{i=1}^N x_i  
\label{eq:avg}  
\end{equation*}  
Average formula (Eq.~\ref{eq:avg}).
```

What you think that will happen?



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Mathematical Formulas (without numbering):

```
\begin{equation*}  
1/N \sum_{i=1}^N x_i  
\label{eq:avg}  
\end{equation*}  
Average formula (Eq.~\ref{eq:avg}).
```

What you think that will happen? The \star symbol can be also applied in tables, figures, sections, . . .



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Mathematical Formulas (inline):

$\frac{1}{N} \sum_{i=1}^N x_i$

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Mathematical Formulas (inline):

`$1/N \sum_{i=1}^N x_i$`

you can also put inline formulas centered in the text

```
\[  
1/N \sum_{i=1}^N x_i  
\]
```



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Finally, we also may need to add some bibliographic references.

Add `bibtex` to the compilation script (TeXworks already does this!).

```
pdflatex document  
pdflatex document  
bibtex document  
pdflatex document
```



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You need to create a file for the references (named it references.bib) and the following content:

```
book{calder1979einstein,                % key
     title={Einstein's universe},        % title
     author={Calder, Nigel and Albert, Einstein}, % author
     year={1979},                        % year
     publisher={Viking Press}            % publisher
}
```



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In your \LaTeX main file you should call now the bibliography file.

```
\begin{document}
```

```
\begin{equation}
```

```
e = mc^2
```

```
\label{eq:massenergy}
```

```
\end{equation}
```

Mass Energy Einstein equivalence formula (Eq.~\ref{eq:massenergy}).

```
\bibliographystyle{plain}
```

```
\bibliography{references}
```

```
\end{document}
```



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Previous gave a warning when generating the references list. Do you know why?



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Previous gave a warning when generating the references list. Do you know why?

```
\begin{document}

\begin{equation}
e = mc^2
\label{eq:massenergy}
\end{equation}
Mass Energy Einstein equivalence formula
(Eq.~\ref{eq:massenergy})~\cite{calder1979einstein}.

\bibliographystyle{plain}
\bibliography{references}

\end{document}
```



Bibliography



Michael McNeil Forbes.

Documentation for the ubcthesis_new latex class.

2011.



Tobias Oetiker, Hubert Partl, Irene Hyna, and Elisabeth Schlegl.

The not so short introduction to \LaTeX , 2010.



Sources of Information.

More documentation can also be found in the following references:

1. <http://www.latex-project.org/>
 2. <http://www.ctan.org>
 3. <http://www.texdoc.net/>
- ... and, of course ...



Sources of Information.

More documentation can also be found in the following references:

1. <http://www.latex-project.org/>
 2. <http://www.ctan.org>
 3. <http://www.texdoc.net/>
- ...and, of course ... <http://www.google.com>



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Lets practice!

Exercises.