

Exercise 8: Getting started with L^AT_EX

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1 What is L^AT_EX

L^AT_EX is a text formatting language. It is a markup language, like for example HTML, meaning that you have to type formatting codes around your headlines, sections, bullet lists, boldfaced text etc. But where HTML is for displaying documents on the web, L^AT_EX is for creating articles, books, reports and technical documentation. While you focus on the content, L^AT_EX will do the layout for you.

2 Getting started

- Make a sub directory for this exercise in you home directory, and change to it:

```
$ mkdir ex8-latex  
$ cd ex8-latex
```

- L^AT_EX documents are written in an ordinary text editor. Open Emacs (or another text editor of your choice), and create a file called first.tex. Make sure you save it in the ex8-latex directory.

3 Make your first L^AT_EX document

- Write the following in the file, and save it:

```
\documentclass[a4paper,11pt]{article}  
\usepackage[latin1]{inputenc}  
\usepackage{times}  
  
\title{My first little LaTeX document}  
\author{My name\\\texttt{my@email}}  
  
\begin{document}  
\maketitle{}  
  
This is my first \LaTeX{} document.
```

```

\section{My first bullet list}
\begin{itemize}
\item Bullet 1
\item Bullet 2
\end{itemize}

\textbf{This is bold text}

\end{document}

```

- Save the file.

4 Making and viewing a dvi file

- From the command line, run:

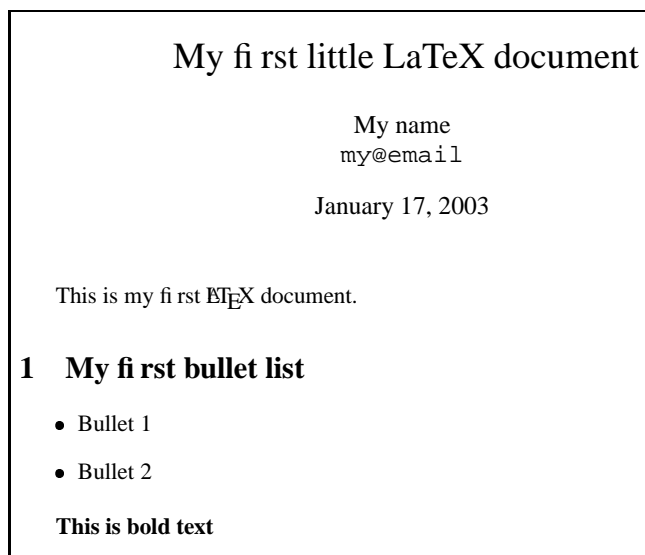
```
$ latex first.tex
```

Remember, you have to be in the ex8-latex directory.

- If the "latex" program stops and displays some error messages, you have made a typing error somewhere in your document. Press "ctrl+c" to stop the running "latex" command. Fix the mistake in you document, and try again.
- When "latex" runs correctly, it will create a file called "first.dvi". View the dvi file with the command

```
$ xdvi first.dvi
```

This will open your dvi file in the program "xdvi". Here you see for the first time, what your document is going to look like:



5 Making and printing a PostScript file

- The command "dvips" creates a postscript file from your document:

```
$ dvips -o first.ps first.dvi
```

The output file is called first.ps.

- View the PostScript file with the "gv" program:

```
$ gv first.ps
```

- A PostScript file can be sent directly to a printer, if the printer supports PostScript. All the network printers on ITU can handle PostScript.
- Print the PostScript file "lpr" command:

```
$ lpr -Pprint first.ps
```

where "print" is the printer name.

If you don't give the "-o" option followed by an output file name to the "dvips" command, it will try to print the generated PostScript file to the default printer.

- With the "-P" option, you can specify a printer directly to the "dvips" command:

```
$ dvips -Pcolourprint first.dvi
```

6 Making a pdf file

- The command "dvi2pdf" can be used to create a pdf file from your document:

```
$ dvi2pdf first.dvi
```

- The pdf file is called "first.pdf". You can view it with Acrobat Reader:

```
$ acroread first.pdf
```

7 PDFLaTeX

- There is an easier way to make a pdf file directly from the tex file:

```
$ pdflatex first.tex
```

- This makes the first.pdf file right away.
- You can choose to print the file directly from your pdf viewer, e.g. Acrobat reader, and not use the dvi file format at all.

8 L^AT_EX commands

- Now you have made your first L^AT_EX document, but what does all the codes mean? The text between `\begin{document}` and `\end{document}` is the body of the document. Everything before `\begin{document}` is the headers. First let us take a look at the document headers:

```
\documentclass[a4paper,11pt]{article}
\usepackage[latin1]{inputenc}
\usepackage{times}
```

- The "documentclass" sets a default style for the document, defining font size, whether there will be page numbers etc. We use the "article" style, with two options: Use 11pt as the size of the main font in the document (10 is default), and use A4 paper (letter is default).
- A "usepackage" line includes one of the many L^AT_EX enhancement package. `\usepackage[latin1]{inputenc}` is for making it possible to use the Danish letters "æ, ø and å" in the document. If you want to change the language of the titles that L^AT_EX writes for you can do it with the command `\usepackage[danish]{babel}`. `\usepackage{times}` includes the "times" font - without this package you get ugly fonts in your pdf files. See more about document classes and packages in [1].
- There are two more lines before the "body" of your document starts with the `\begin{document}` command:

```
\title{My first little \LaTeX{} document}
\author{My name\\\texttt{my@email}}
```

Here you define the title of the document, and the author. But you are only defining them - you are still in the header of the document. The `\maketitle{}` command just after `\begin{document}` is what makes it appear in the output document.

- From your first L^AT_EX document, you are already familiar with the formatting commands for sections, bullet lists and bold text in L^AT_EX. Let us look at some more commands.

`\abstract{The abstract goes here}` Make document abstract.

%Comment A line starting with a % sign is considered a comment in L^AT_EX, and is ignored by the parser.

`\tableofcontents` Generate table of contents here.

`\section{Section headline}` Name of section.

`\subsection{Subsection headline}` Name of subsection.

`\footnote{Footnote text goes here}` Make footnote.

`\emph{Text goes here}` Make *emphasized* text.

`\textbf{Text goes here}` Make **bold faced** text.

`\textit{Text goes here}` Make *italic* text.

`\texttt{Text goes here}` Make teletype text.
`\textrm{Text goes here}` Make roman (normal) text.
`\flushleft{Text goes here}` Left justify text.
`\center{Text goes here}` Center text.
`\flushright{Text goes here}` Right justify text.

- Try some of the above commands in your document. Run `latex` on your document and view it with `xdvi` to see the result.

9 Graphics in LaTeX

- First you need an image in "eps" format to include in your document. You can convert an image to eps with the command:

```
convert myimage.jpg myimage.eps
```

where `myimage.jpg` is your original image file. Or you can download this : <http://www.itu.dk/people/hm/penguin.eps>. Fetch it with the command

```
wget http://www.itu.dk/people/hm/penguin.eps
```

- Put the line

```
\usepackage[dvips]{graphicx}
```

in your document header.

- Insert the image in your document with this command:

```
\includegraphics[scale=0.5]{penguin.eps}
```

- Run `latex` on your document and view it with `xdvi` to see the result.

10 Graphics in PDFLaTeX

- *Graphics in Pdf format:* When you are using the pdf format you have the possibility of using other graphics formats than eps. This can be a big advantage since eps is not made for bitmap graphics, so if you have any bitmap graphics in you document it is recommended that you use .pdf as an output format instead. You can get a png image here: <http://www.itu.dk/people/hm/mozilla.png>. Fetch it with the command

```
wget http://www.itu.dk/people/hm/mozilla.png
```

- The only thing that need to be changed in the document, is what package you use. Specify that we want to use `pdftex` instead of `dvips` as shown below. Now you can use png images:

```
\usepackage[pdftex]{graphicx}
\includegraphics[scale=1.1]{mozilla.png}
```

Also, you have to use the "pdflatex" command instead of "latex" and "dviPDF":

```
$ pdflatex filename.tex
```

This creates a pdf file directly from the LaTeX document.

- Another useful command is:

```
\DeclareGraphicsExtensions{.png,.gif,.jpg}
```

When this is done it's now possible to only write the name of the image file, e.g..

```
\includegraphics[scale=1.1]{mozilla}
and LATEX will first try to find mozilla.png, mozilla.gif, etc...
```

11 Getting further with L^AT_EX

To learn more about L^AT_EX, have a look at [3] (in Danish). Also have a look at [1], which is a very good introduction to L^AT_EX. If you are not comfortable with text editors, try the graphical L^AT_EX editor texmaker.

References

- [1] Tobias Oetiker et al. *The Not So Short Introduction to LaTeX*. <http://www.itu.dk/people/hm/undervisning/fall2001/2001-10-04/lshort.pdf>
- [2] *LaTeX help 1.1*. http://www.emerson.emory.edu/services/latex/latex_toc.html
- [3] Niels Hallenberg *Opgave: Hvad skal der til for at skrive en simpel rapport i LaTeX*. <http://linuxlab.dk/learnlinux/notes/2001-04-26/>
- [4] Leslie Lamport, Duane Bibby. *LaTeX : A Documentation Preparation System User's Guide and Reference Manual*.
- [5] Michel Goossens, Frank Mittelbach, Alexander Samarin. *The Latex Companion*.
- [6] Helmut Kopka, Patrick W. Daly. *A Guide to L^AT_EX: Document Preparation for Beginners and Advanced Users*.