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L^AT_EX

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Learning L^AT_EX

- There is a good L^AT_EX guide available at:
<http://www.ctan.org/tex-archive/info/lshort/english/>
- Another good way to learn L^AT_EX is by example: get the source for a document that looks like what you want, and see how it does what it does.

TEX and L^ATEX

- TEX is a markup language for typesetting.
- L^ATEX is a more useful language built on top of TEX.
- No direct control of formatting. This seems Bad if you are used to WYSIWYG wordprocessors, but it is actually Good.
- Input files are text – you can write documents in your favourite text editor.

A simple example

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

Building the example

- Put the contents of previous slide in `whatever.latex` (use `emacs` or `vi`)
- `latex whatever.latex` – outputs `whatever.dvi`
- `xdvi whatever.dvi` – views the output on-screen
- `dvipdf whatever.dvi` – converts to `whatever.pdf`.

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Example output

Small is beautiful.

Two kinds of markup

- *Commands* look like

```
\somecommand[opt params]{params}
```

- *Environments* look like:

```
\begin{someenvironment}
```

some text here

```
\end{someenvironment}
```

More examples

We can have paragraph breaks.

by putting in a blank line.

We can `\emph{emphasise text!}`

and `\use`

some `‘‘special’’` symbols `\ldots`

We can have paragraph breaks

by putting in a blank line. We can *emphasise text!* and

use some “special” symbols...

Mathematics

We can embed maths, such as x^2 inside a paragraph.

We can embed maths, such as x^2 inside a paragraph.

```
\begin{equation}
a^2 + b^2 = c^2
\end{equation}
```

$$(1) \quad a^2 + b^2 = c^2$$

Mathematics

Some things to do:

superscripts	<code>x^2</code>	x^2
subscripts	<code>x_2</code>	x_2
greek letters	<code>\Delta x</code>	Δx
special symbols	<code>\forall x \in U</code>	$\forall x \in U$
fractions	<code>\frac{x}{y-1}</code>	$\frac{x}{y-1}$

Mathematics

These can be combined into very complex layouts:

```
$ \lim_{ n \to \infty }  
\sum_{k=1}^n  
\frac{1}{k^2}$
```

$$\lim_{n \rightarrow \infty} \sum_{k=1}^n \frac{1}{k^2}$$

Footnotes

You can easily `\footnote{Well, quite easily}` put footnotes in-line into your text, and they will be placed on the appropriate page.

You can easily ^a put footnotes in-line into your text, and they will be placed on the appropriate page.

^aWell, quite easily

Numbered Lists

There are two kinds of list:

```
\begin{enumerate}
\item With numbers (enumerate)
\item Without numbers (itemize)
\end{enumerate}
```

There are two kinds of list:

1. With numbers (enumerate)
2. Without numbers (itemize)

Un-numbered Lists

There are two kinds of list:

```
\begin{itemize}
```

```
\item With numbers (enumerate)
```

```
\item Without numbers (itemize)
```

```
\end{itemize}
```

There are two kinds of list:

- With numbers (enumerate)
- Without numbers (itemize)

Verbatim

```
\begin{verbatim}
This is
verbatim text.
\end{verbatim}
This is
verbatim text.
```

Tables

```
\begin{tabular}{|lr|c|}  
\hline  
I like & cheese & true \\  
      & cabbage & false \\  
\hline  
I hate & mushrooms & true \\  
\hline  
\end{tabular}
```

I like	cheese	true
	cabbage	false
I hate	mushrooms	true

Sections

```
\section{Act, the first}
\subsection{The Happy Subsection}
This subsection is very happy.
```

1 Act, the first

1.1 The Happy Subsection

This subsection is very happy.

More sections

```
\section{Act, the second}
\label{secondact}
This is the second Act,
which we label for future reference.
```

2 Act, the second

This is the second Act, which we label for future reference.

Other section commands

```
\section{section}
```

```
\subsection{subsection}
```

```
\subsubsection{subsubsection}
```

```
\paragraph{paragraph}
```

```
\subparagraph{subparagraph}
```

Table of Contents

`\tableofcontents`

Contents

1	Act, the first	17
1.1	The Happy Subsection	17
2	Act, the second	18

A note on multipass building

\TeX only makes one pass through the document each time you run it.

Can't build a table of contents at the start until we've passed through the whole document.

So need to run build command two (or sometimes three) times in a row to get everything right.

This also applies for crossreferences.

Crossreferences

On slide `\pageref{secondact}`, in section `\ref{secondact}`, we defined a label `''secondact''`.

On slide ??, in section ??, we defined a label “secondact”.

Document classes

Most formatting for document is controlled by the *document class*.

The first line of a \LaTeX document looks something like:

```
\documentclass{article}
```

The string “article” says the document is to be formatted as an article.

For this presentation, I use:

```
\documentclass{prosper}
```

“prosper” is a document class which causes my document to be formatted as a slide show.

More document classes

Some document classes that come with \LaTeX are:

article	short articles
report	Technical reports and Ph.D theses
book	Real books

More layout stuff

`\newpage` starts a new page

`\\` starts new line without starting a new paragraph

`\-` is a discretionary hyphen – it indicates to \LaTeX where it should break the word if it needs to.

`\mbox{my text here}` means the text will never be split by word wrapping or hyphenation.

Things that can go wrong

Like any Real Man's language, the error output is at times obscure.

The following slides are some errors I came across while making these slides.

File not found

latex ook.tex

! I can't find file 'ook.tex'.

Wrong filename

Overfull hbox

Overfull hbox (214.66396pt too wide)
in paragraph at lines 322--322

\TeX tries to lay things out nicely. But in this case, it ended up with a paragraph that it couldn't get quite right and had to spill into the margins (so your document will look more ugly or some text will fall off the page)

Line 322 refers to a line in the source document, containing the offending paragraph.

here is an example of some text that ca

Undefined control sequence

Undefined control sequence.
1.306 \textt {! I like cheese.}

On line 306, I had used:

```
\textt{I like cheese.}
```

when I should have used

```
\texttt{I like cheese.}
```

forgotten endgroup

```
! Extra }, or forgotten \endgroup.  
\endminipage ...pagefalse \color@endgro  
    \expandafter \@iiiparbox \...  
1.55 \end{slide}
```

This is because I ended a slide section with

```
\end{slide}
```

when I still had another environment open – I
had forgotten to say

```
\end{itemize}
```

Other things you can do

- Many other formatting commands
- Advanced bibliography handling with `bibTEX`
- Construct indexes
- T_EX and L^AT_EX can be used to typeset slides, such as this presentation, using the *prosper* package.
- Packages for lots of interesting extra functionality are available from CTAN, the *Comprehensive T_EX Archive Network*. (*prosper* is an example).