LaTeX basics

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1 Overview

LaTeX is a markup language (and program) for typesetting documents. It consists of many commands and environments that specify (to the compiler) how the output document should look. In general, commands produce or modify a small bit of text, whereas environments modify a larger part of text.

1.1 Document structure

- Every document consists of a "preamble" and a "body".
- The preamble includes declarations of document classes, packages, definitions, and other document-wide specifications.
- The body includes the main text (title, sections, ...).

Example

```
% My first LaTeX document!

% PREAMBLE
\documentclass{article}

% BODY
\begin{document}
Hello beautiful world!
\end{document}
```

Example output

Hello beautiful world!

1.2 Commands and environments

- Every command starts with a backslash, is case-sensitive, and may take options (in square brackets) and arguments (in curly brackets).

Syntax

```
\command[option1,option2,...]{arg1}{arg2}...
```

Example

```
\textbf{This sentence will be bold.}
```

[1]This handout is borrowed in large part, with permission, from Brian Buccola & Alanah McKillen.

Example output

This sentence will be bold.

- Some commands do not require options or arguments; they simply produce something as is.

  Example

  ```
  \dots
  ```

  Example output

  ...

- Every environment starts with a `\begin` command and ends with an `\end` command, whose arguments are the environment name.

  Syntax

  ```
  \begin{environmentname}
  Text to be modified.
  \end{environmentname}
  ```

  Example

  ```
  \begin{enumerate}
  \item First item in a numbered list.
  \item Second item.
  \end{enumerate}
  ```

  Example output

  1. First item in a numbered list.
  2. Second item.

1.3 Special characters and accents

- LaTeX reserves a number of characters for special purposes, such as curly brackets, as we've seen. The following is a more complete list.

  ```
  # $ % ^ & _ { } ~ \
  ```

- There are usually two ways to produce these characters: (1) use a backslash to "escape" the special character, e.g. `\#` produces #, or (2) use the relevant command for that symbol, e.g. `\textbackslash` produces \.[2]

- Accents and other diacritics are produced similarly.

  Syntax

  ```
  \symbol{character}
  ```

[2] `\\` is the command for a line break.

Example

```
\^{a} \"{a} \~{a}
```

Example output

â ä ã

- Beginning and ending single quotation marks are produced using ` (grave accent) and ' (vertical quote), respectively; double quotes are produced by doubling these characters, *not* by using the double quotation character ".

Example

```
Bill said, ``Hello''.
```

Example output

Bill said, “Hello”.

1.4 Whitespace and comments

- Consecutive “whitespace” characters (spaces, tabs) are treated as one “space”.

Example

```
The extra whitespace right here        will not show up
in the output.
```

Example output

The extra whitespace right here will not show up in the output.

- Similarly, single line breaks are treated as one “space”.

Example

```
This
will
all be
on one line.
```

Example output

This will all be on one line.

- A double linebreak indicates the start of a new paragraph; more than that is just treated as a double linebreak.

Example

```
This is one paragraph that stretches stretches
stretches stretches stretches onto multiple lines.

This begins a new paragraph.
```

Example output

This is one paragraph that stretches stretches stretches stretches stretches onto multiple lines.

This begins a new paragraph.

- You can insert your own comments by appending each comment line with `%`; the compiler ignores anything following a `%` on a given line.

Example

```
Some \textit{italic} text. % My comment about fun
                           % with italics
```

Example output

Some *italic* text.

2 Typesetting: some specifics

The beauty of LaTeX is that, with just a handful of basic commands, you can write a nicely structured and good-looking document without the distractions of tweaking and fiddling that come with WYSIWYG word processors.

2.1 Document structuring commands

- To automatically create a title page, first, in the preamble, use the `\title`, `\author`, and `\date` commands to define the title, author, and date; then use the `\maketitle` command in the body to create a title page.

Example

```
\documentclass{article}
\title{Minimalist Program II: Maximize Minimalism}
\author{Noam Chomsky}
\date{\today}
\begin{document}
\maketitle
In this paper, I revise my earlier proposal \dots
\end{document}
```

- *Tip:* Use the `\today` command to automatically insert the day on which the document is compiled.

- To add an abstract, use the `abstract` environment.

Example

```
\begin{abstract}
This paper defends the geocentric model of the
universe.
\end{abstract}
```

- To create section and subsection headings, use the `\section` and `\subsection` commands. They take the (sub)section name as their argument and are numbered automatically.

  Syntax

  ```
  \section{Section Name}
  ```

- *Tip:* To exclude a (sub)section number, use `\section*` and `\subsection*` instead.

- To add a footnote, use the `\footnote` command. It takes the entire footnote text as its argument.

  Syntax

  ```
  Here's some text.\footnote{Here's a footnote!}
  ```

2.2 Modifying text

- To make text bold, italic, smallcaps, or typewriter, use the `\textbf`, `\textit`, `\textsc`, and `\texttt` commands.

- Alternatively, precede the text with the commands `\bf`, `\it`, `\sc`, or `\tt`, and enclose the whole thing in curly brackets.

  Example

  ```
  This is some \textbf{bold}, \textit{italic},
  \textsc{smallcaps}, and \texttt{typewriter} text.

  This is some {\bf bold}, {\it italic},
  {\sc smallcaps}, and {\tt typewriter} text.
  ```

  Example output

  This is some **bold**, *italic*, SMALLCAPS, and `typewriter` text.
  This is some **bold**, *italic*, SMALLCAPS, and `typewriter` text.

- *Tip:* Some of the fullform commands can be nested: `\textbf{\textit{hi!}}` produces ***hi!***.

- To change font size, use the commands `\tiny`, `\small`, `\large`, `\Large`, `\LARGE`, etc. (See documentation for full list.)

  Example

  ```
  Some {\tiny tiny}, {\small small}, normal, {\large
  large}, {\Large larger}, {\LARGE even larger}
  text.
  ```

  Example output

  Some tiny, small, normal, large, larger, even larger text.

- These font sizes are relative to the font size option declared in the document class, e.g. `\large` in a `12pt` document is roughly the same size as `\Large` in a `10pt` document.

2.3 Math mode

- To produce mathematical symbols, enclose your math text in dollar symbols; this is called math mode.

  Example

  ```
  $\forall x \in \mathcal{P}(A): \exists y \in
  \phi(B \times C): y = x^5 - \alpha_3$
  ```

  Example output

  $\forall x \in \mathcal{P}(A) : \exists y \in \phi(B \times C) : y = x^5 - \alpha_3$

- Maths symbols can be thrown right into normal text.

  Example

  ```
  If $\alpha$ is of type $a \rightarrow b$ \dots
  ```

  Example output

  If α is of type $a \rightarrow b$ ...

2.4 Some useful commands and shortcuts

`\dots` create ellipsis dots

`\noindent` disable indent for this paragraph

`\hfill` fill horizontal space (moves the following text all the way rightward)

`-` hyphen (-)

`--` en-dash (–)

`---` em-dash (—)

2.5 Some useful environments

- Here's a list of some useful environments, all of which follow the syntax described earlier.

`itemize` create bulleted lists

`enumerate` create numbered lists

`center` center a block of text

`flushleft` left-align a block of text

`flushright` right-align a block of text[3]

`tabular` create a table

`figure` create a figure

`quote` create a block quote

[3]Text is left- *and* right-aligned (justified) by default.

3 Next time?

Advanced topics

- labels and references
- defining new commands and environments; redefining current ones
- tables
- including graphics
- hyperlinks (`hyperref`)

Linguistics-specific topics

- numbered examples (`linguex`)
- syntax trees (`forest`)
- IPA (`tipa`)
- OT tableaux (`OTtablx`)

4 LaTeX resources

- LaTeX Wikibook (`https://en.wikibooks.org/wiki/LaTeX`): a detailed guide which is an excellent starting point for any topic.
- The Great, Big List of LaTeX Symbols (`https://www.rpi.edu/dept/arc/training/latex/LaTeX_symbols.pdf`): a list of the most common LaTeX symbols you're likely to be looking for. Worth a browse to get an idea of what you can do.
- The Comprehensive LaTeX Symbol List (`http://anorien.csc.warwick.ac.uk/mirrors/CTAN/info/symbols/comprehensive/symbols-a4.pdf`): a more comprehensive list; if you ever need to find a symbol, search this PDF. Includes my favourite LaTeX functionality, from the `simpsons` package:

`\Marge \Homer \Bart \Lisa \Maggie`