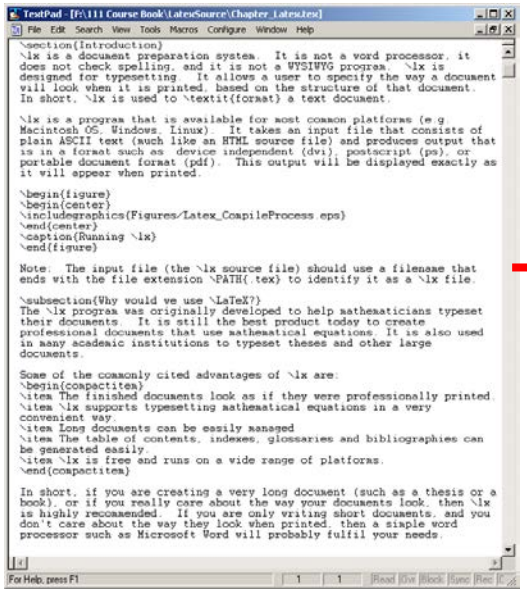
COMPSCI 111 / 111G

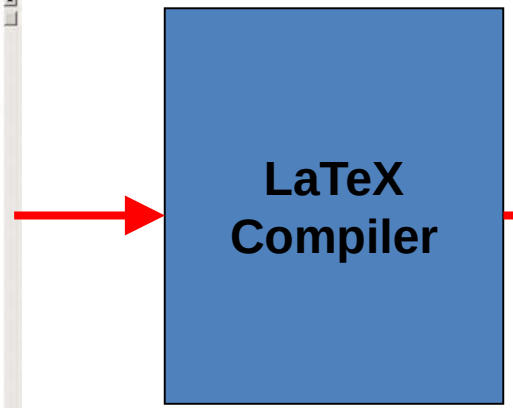
Mastering Cyberspace:
An introduction to practical computing

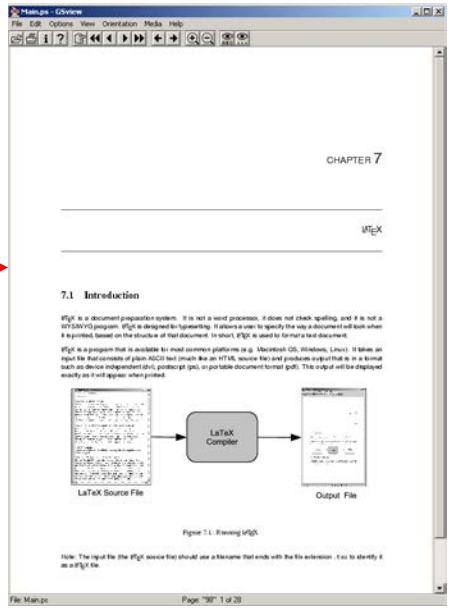
LaTeX

LaTeX

- **A document preparation system**
  - Used to typeset a document







http://en.wikipedia.org/wiki/LaTeX

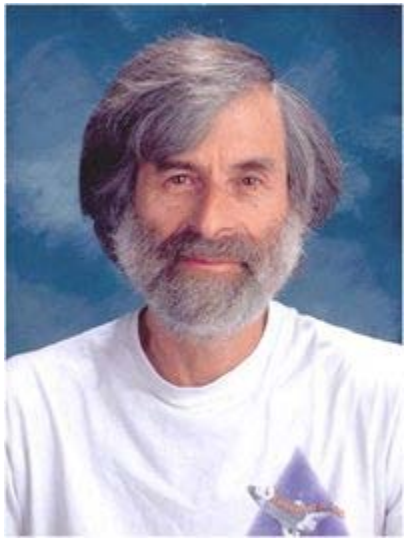
Why?

- **Why use LaTeX when we have word processors?**
  - Results look better
  - Focus on structure helps document development
  - Best tool available for mathematical layout
  - Works well for large documents
  - Automatically generates:
    - Table of contents
    - Lists of figures
    - Lists of tables
    - Index
    - Glossaries
    - Bibliography
  - Free and runs on many platforms

Development

- **Donald Knuth**
  - Stanford University
  - The Art of Computer Programming
  - Created TeX and METAFONT
  - 1978 - 1989 Development of TeX

- **Leslie Lamport**
  - LaTeX 1984
  - Extensions to TeX
  - Easier than TeX
  - Focus on the structure of the document
  - Standard way to use TeX



Commands

- **Used to tell LaTeX how to typeset something**
  - Commands are case sensitive
  - Optional parts are in square brackets
  - Compulsory parts are in curly braces

```
\commandname[options]{argument}
```

Environments

- **Apply a change to the content within the environment**
  - New environments start new paragraphs

```
\begin{environmentname}

...

\end{environmentname}
```

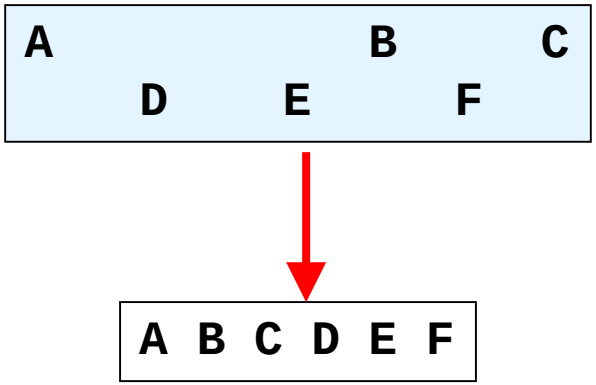
Comments

- **Used to annotate the document**
  - Ignored by the compiler
  - Aimed at other humans

```
% Comments starts with a percentage sign
% All text is ignored until the end of the
% line is reached.
```

Whitespace

- **Whitespace characters**
  - Space
  - Tab
  - Line break
- **White space is largely ignored apart from:**
  - Space between words.
  - Blank lines between blocks of text that are used to make paragraphs.
- **Two or more consecutive whitespace characters**
  - Reduced to a single space



Special characters

- **Characters that are used in the syntax of the language**
  - Can't type these characters directly
  - Need a special way to print them
  - 10 characters

\ $ % ^ & _ ~ # { }

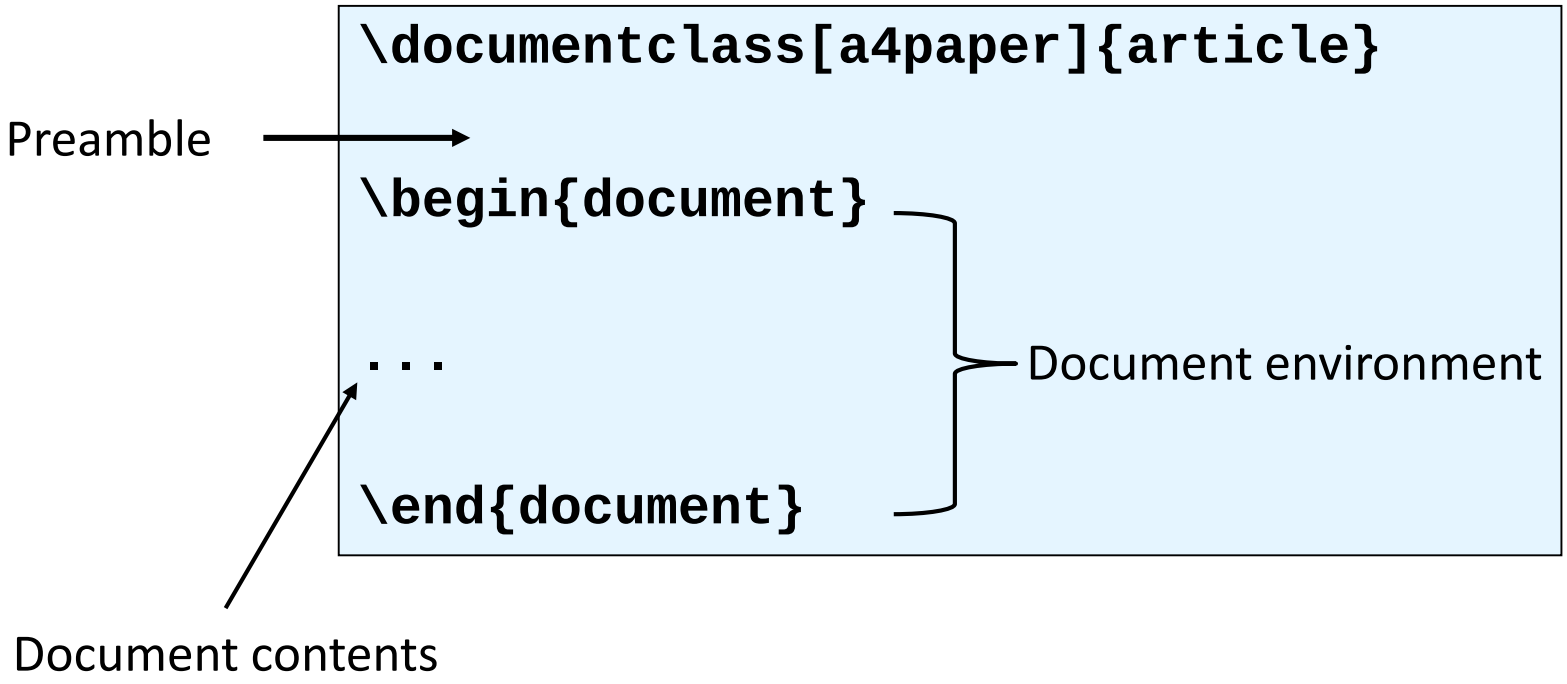
Creating a LaTeX document

- **\documentclass**
  - Defines the type of document
  - Book
  - Report
  - Article
  - Letter

- **The document environment encloses the contents of the document**

- **The space between the document class command and the start of the document environment is called the preamble.**
  - Contains commands that affect the entire document.

Creating a LaTeX document



Adding a title

- **Require four commands to create a title**
  - `\title{ put the title here }`
  - `\author{ author goes here }`
  - `\date{ date goes here }`

- **Once the information has been defined, insert the title**
  - `\maketitle`

```
...
\begin{document}
\title{A very short document}
\author{Andrew Luxton-Reilly}
\date{2006}
\maketitle
This is the document.

\end{document}
```

Structuring a document

- \part{ part name goes here }
- \chapter{ chapter name goes here }
- \section{ section name goes here }
- \subsection{ subsection name goes here }
- \subsubsection{ subsubsection name goes here }
- \paragraph{ paragraph name goes here }

Table of contents

- **Table of contents is automatically generated using the \tableofcontents command.**
  - Parts
  - Chapters
  - Sections
  - Subsections

- **Each command has an table of contents option**
  - Displays a different name in the table of contents

```
\section[Introduction]{An introduction
to typesetting using the LaTeX language}
```

Footnotes

- **Footnotes are created in the text as you type them**
  - `\footnote{ footnote text goes here }`

```
\documentclass[a4paper]{report}

\begin{document}
\title{A very short report}
\author{Andrew Luxton-Reilly}
\date{2006}
\maketitle

This is the document\footnote{Note that the
document is a report} that I am using as an
example.

\end{document}
```

Paragraphs and line breaks

- **LaTeX will remove excess whitespace**
  - Need to explicitly include paragraphs and line breaks
- **Paragraph**
  - Leave a blank line in the input
- **Line break**
  - Use the command \\

```
A short paragraph.

Another short paragraph.

And\\
some lines\\
that appear sequentially.
```

Quote marks

- **Unidirectional quotes (") are inadequate**
  - Use the symbols ` and ' for single quotes
  - Use the symbols `` and '' for double quotes

```
He said, ``As they say, `you win some, you
lose some' ''.
```

He said, “As they say, ‘you win some, you lose some’ ”.

Dashes

- **Hyphen (-)**
  - Short dash to join different words together
  - merry-go-round
- **En dash (--)**
  - Longer dash used to indicate a range of values
  - pages 45–50
- **Em dash (---)**
  - Very long dash between words or phrases
  - There are many commands—some more complex than others—that are used in LaTeX.

Ellipsis

- **Three dots in a sequence**
  - Used to indicate text that ... has been removed
  - Or an unfinished ...

- **Can't just use three full stops in a row**
  - LaTeX will use incorrect spacing
  - Use the `\ldots` command

```
\ldots or so he said.
```

… or so he said

Spaces

- **Lines have to be broken to wrap text**
  - Try to break at a space
  - Try to break at a syllable

- **Some spaces we don't want to be broken**
  - E.g. between initials and surnames

Bad layout ⟶

```
The lecturer for this course is A.
J. Luxton-Reilly
```

- **Use a tilde ~ to signify a space that we can't break**

```
The lecturer for this course is
A.~J.~Luxton-Reilly
```

Emphasis

- **Emphasis**
  - `\emph{ text to be emphasized here }`

```
It is \emph{very} important to
practice the typesetting commands
so that you don't \emph{forget} them.
```

References

- **There are many LaTeX tutorials on the Internet**
  - http://www.tug.org/interest.html
  - http://www.latex-project.org/
  - http://www.ctan.org
- **Web site that allows you to try it out**
  - http://sciencesoft.at/index.jsp?link=latex&size=1280&js=1&lang=en
- **Tutorial documents**
  - The (not so) short guide to LaTeX
- **Online course reference manual**