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

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

\begin{array}{cccc}
A & B & C \\
D & E & F \\
\end{array}
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

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

\documentclass[a4paper]{article}
\begin{document}
...
\end{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 }

```latex
\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

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

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

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

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

- \textit{very} important to practice the typesetting commands so that you don’t \textit{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

- Tutorial documents
  - The (not so) short guide to \LaTeX

- Online course reference manual