Introduction to LaTeX

Learning Outcomes

- **Recognise** the advantages of LaTeX and its applications in the wider context of typesetting
- **Identify** the key features for reading and compiling an existing .tex document
- **Develop** new technical documents from simple templates
- **Create** simple equations, figures, tables, lists and references within LaTeX
- **Assess** and troubleshoot common compiler problems and use online aid tools

LaTeX

- What is LaTeX?
- How do I use it?
- Why would I use it?

Overleaf

- Online environment for creating and compiling LaTeX documents
- Pros
  - Cross-platform
  - Complete
  - Easy to use
  - Allows collaboration
  - Cloud syncing with Dropbox and Github
  - Integrated “review” system for feedback
- Cons
  - Editor online only
  - Data stored online – implications for patient data

Creating a document

Preamble

```
\documentclass[12pt,a4paper]{article}
\usepackage{graphicx}
\usepackage{amssymb, amsmath}
\usepackage[citecolor=black]{hyperref}
```

Main body

Comments

```
\begin{document}
% What you don't see
What you see %You also don't see this
\end{document}
```

Problem Sheet

Sections

```
\section{The Cat}
Some text
\subsection{Sat On}
More text
\subsubsection{The Mat}
Even More Text
```

1 The Cat

Some text

1.1 Sat On

More text

1.1.1 The Mat

Even More Text

Chapters and Paragraphs

```
\chapter{A Poem}
\section{The Cat}
\subsection{Sat On}
\subsubsection{The Mat}
\paragraph{Author}Chris
```

Chapter 1

A Poem

1.1 The Cat

1.1.1 Sat On

1.1.1.1 The Mat

Author Chris

Table of Contents

\tableofcontents

Contents

Modifying Text

```
The \emph{slanty cat}

The \textbf{fat cat}

The \underline{important cat}

The {\huge huge cat}

The {\large large cat}

The {\small small cat}
```

The *slanty cat*

The **fat cat**

The important cat

The huge cat

The large cat

The small cat

Problem Sheet

Lists

```
\begin{itemize}
  \item A Cat
  \item A Hat
\end{itemize}

\begin{enumerate}
  \item A Cat
  \item A Hat
\end{enumerate}
```

- A Cat
- A Hat

1. A Cat
2. A Hat

Problem Sheet

Equations

Of course,

```
\begin{equation}
x + y = 7 \alpha,
\end{equation}
```

should be obvious, where α is defined as

Of course,

$$x + y = 7\alpha, \tag{1}$$

should be obvious, where α is defined as

Mathmode Commands

```
$\frac
{
\Gamma }
{ \sqrt{\gamma} }$
```

$$\frac{\Gamma}{\sqrt{\gamma}}$$

```
$\int_{0}^{\pi} \textrm{d}x
\sin x$
```

$$\int_0^\pi \mathrm{d}x \sin x$$

```
$\lim_{x \to \infty} \log x$
```

$$\lim_{x \to \infty} \log x$$

```
$\sum\limits_{n=0}^{N}
```

$$\sum_{n=0}^{N} n^2$$

Problem Sheet

Special Characters

```
\$    \&    \%
\textgreater
\textbackslash
\`{e} \'{a} \"{o}
$\vec{v}$
$\widetilde{oo}$
$\widehat{abc}$
```

$ & %

$>$

$\backslash$

è á ö

$\vec{v}$

$\widetilde{oo}$

$\widehat{abc}$

Figures

```
\begin{figure}[t]

\centering

\includegraphics[width
=10cm]{Cat_Box}

\caption{Cats!}

\end{figure}
```

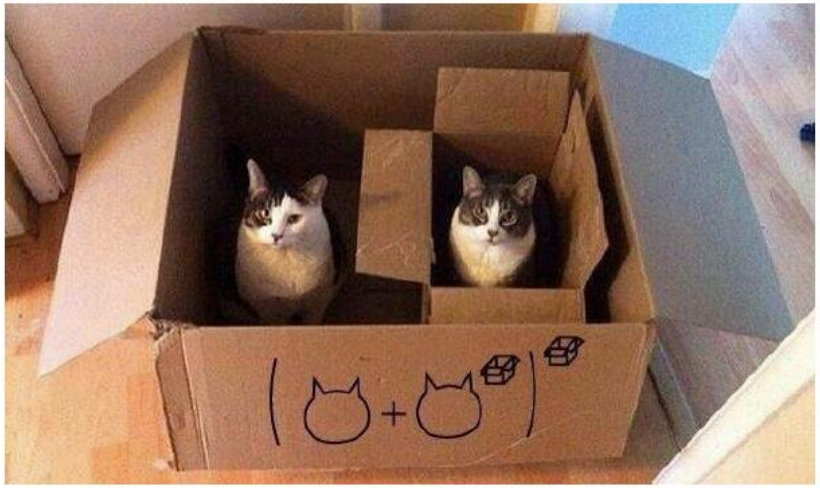


Figure 1: Cats!

Tables

```
\begin{table}[h]
  \centering
  \begin{tabular}{ l |  c  r }
          & Column A   & B\\
    \hline
    Row 1  &    & C \\
    2     & D     & Big cell
  \end{tabular}
  \caption{An arbitrary table}
\end{table}
```

	Column A	B
Row 1		C
2	D	Big cell

Table 1: An arbitrary table

Problem Sheet

Referencing

```
\section{Referencing...}

\begin{equation}
x+y=7\alpha
\label{keyword1}
\end{equation}

... see Section \ref{sections}


\section{...Sections}\label{sections}

...see \eqref{keyword1}
```

1 Referencing...

$$x + y = 7\alpha \tag{1}$$

... see Section 2

2 ...Sections

...see (1)

Problem Sheet

Bibliography Management

- Many documents will have a large number of references
- There are many ways to include references and citations in LaTeX
- Many reference management programs allow the exporting of bibliogrpahies in a .bib file

Bibliography Management

myrefs.bib

```
@article{thor_2011,
author = "A.U. Thor",
title = "{LaTeX} is Great",
year = "2011",
journal = "Typesetting Monthly",
volume = "14",
number = "3",
pages = "342--351" }

@book{rowling_1997,
author = "J.K. Rowling",
title = "Philosopher's Stone",
year = "1997",
publisher = "Bloomsbury"}
```

Bibliography

J.K. Rowling. *Philosopher's Stone*. Bloomsbury, 1997.

A.U. Thor. LaTeX is great. *Typesetting Monthly*, 14(3):342 351, 2011.

Bibliography Management

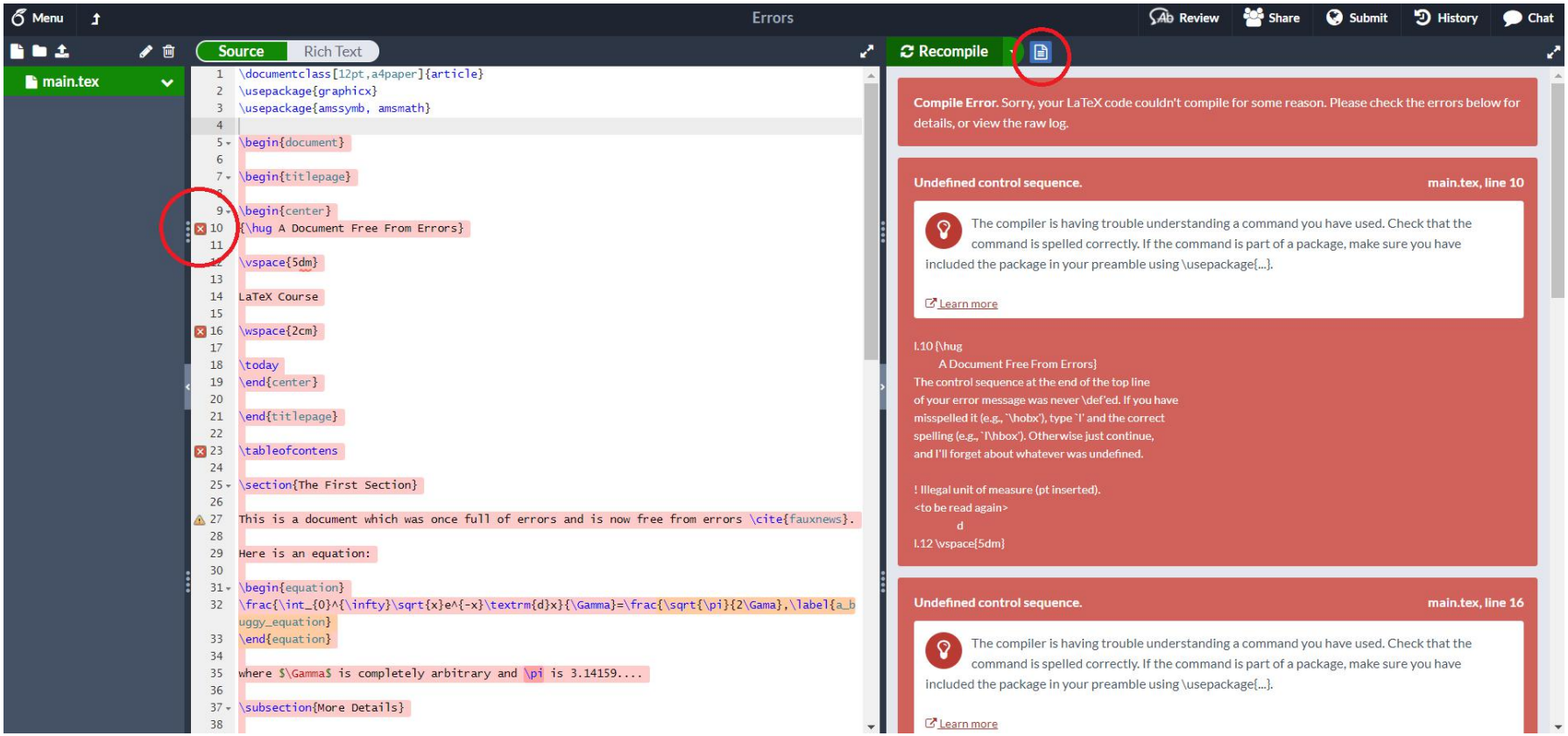
main.tex

```
\usepackage{natbib}

\begin{document}

\citet{thor_2011} is much
better than its competitor
\citep{rowling_1997}

\bibliographystyle{plainnat}
\bibliography{myrefs}
```

Thor [2011] is much better than its competitor [Rowling, 1997]

Problem Sheet

LaTeX Errors



Problem Sheet

Journal Submission

- Journal documentclasses
- Submit your source files
- Perfection not required

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