

# Customising L<sup>A</sup>T<sub>E</sub>X

Up to now we have been using standard L<sup>A</sup>T<sub>E</sub>X commands and packages to create documents.

However, L<sup>A</sup>T<sub>E</sub>X is highly customisable, and if we find that we need to do something that is not covered by an existing command, environment or package, we can write our own!

# Custom L<sup>A</sup>T<sub>E</sub>X Commands/Macros

We specify our own commands using the `\newcommand` command:

```
\newcommand{name}[num]{definition}
```

It requires two arguments, the *name* of the new command, and its *definition*. It also has an optional argument (num) allowing you to specify how many arguments it takes (up to 9).

# Custom L<sup>A</sup>T<sub>E</sub>X Commands - example

```
\newcommand{\ual}{UGC Course on Advanced \LaTeX}
```

This is the \ual.

This is the UGC Course on Advanced L<sup>A</sup>T<sub>E</sub>X.

# Custom L<sup>A</sup>T<sub>E</sub>X Commands - arguments

```
\newcommand{\ualarg}[1]{UGC Course on Advanced \LaTeX\, presented  
by #1}
```

```
\newcommand{\ualargtwo}[2]{UGC Course on Advanced \LaTeX\,  
presented by #1 and #2}
```

This is the `\ualarg{Martin}`.

This is the `\ualargtwo{Martin}{Someone}`.

This is the UGC Course on Advanced L<sup>A</sup>T<sub>E</sub>X presented by Martin.  
This is the UGC Course on Advanced L<sup>A</sup>T<sub>E</sub>X presented by Martin and Someone.

# Custom L<sup>A</sup>T<sub>E</sub>X Commands/Macros

You cannot use digits when naming commands/macros, only letters.

L<sup>A</sup>T<sub>E</sub>X will not allow you to create new commands with the same name as existing commands.

## Custom L<sup>A</sup>T<sub>E</sub>X Commands - changing commands

If you want to re-use the name of an existing command, or change the definition of an existing command, use the `\renewcommand` option:

```
\renewcommand{name}[num]{definition}
```

So, for example, to change Chapter headings from 'Chapter' to 'Bigger Section':

```
\renewcommand{\chaptertitle}{Bigger Section}
```

# Custom L<sup>A</sup>T<sub>E</sub>X Environments

We can specify our own environments using the `\newenvironment` command:

```
\newenvironment{name}[num]{before}{after}
```

Any code given in the before block is processed after the `\begin{name}`.  
Any code given in the after block is processed at the `\end{name}`.

# Custom L<sup>A</sup>T<sub>E</sub>X Environments - example

```
\newenvironment{dotty}{\noindent\textbullet}{\dotfill}  
  
\begin{dotty}  
Here is some text  
\end{dotty}
```

- Here is some text .....



# Custom L<sup>A</sup>T<sub>E</sub>X Environments - counters

We can create environments with counters included, much like the Figure or Table environments, by declaring a counter with the `\newcounter` command:

```
\newcounter{examplecounter}  
\newenvironment{numberedexample}{\refstepcounter{  
examplecounter}\textbf{Example \arabic{examplecounter}  
}}\qquad{}
```

# Custom L<sup>A</sup>T<sub>E</sub>X Environments - counters

```
\newcounter{examplecounter}  
\newenvironment{numberedexample}{\refstepcounter{examplecounter}\  
textbf{Example \arabic{examplecounter}}\quad}{}  
  
\begin{numberedexample}  
An example  
\end{numberedexample}
```

<b>Example 1</b>	An example
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# Source Code in L<sup>A</sup>T<sub>E</sub>X

The `listings` package provides us with an easy way to include source code within our L<sup>A</sup>T<sub>E</sub>X documents.

It allows you to use the `lstlistings` environment to add formatted source code into your document, including features such as line numbers and syntax highlighting.

# The listings package

Most simply, we use `listings` by first including the package in our document:

```
\usepackage{listings}
```

and then by including our source code within a `lstlistings` environment.

## The listings package - code input

Alternatively, we can input source code directly from the source itself:

```
\lstinputlisting[language=Java]{source_filename.java}
```

or import just part of a file:

```
\lstinputlisting[language=Java, firstline=23, lastline  
=31]{source_filename.java}
```

## The listings package - options

The listings package supports many different languages and has many different options to control how the code is displayed, including:

Type	Use
<code>backgroundcolor</code>	set the background colour
<code>basicstyle</code>	set the code font size
<code>captionpos</code>	set the caption position
<code>commentstyle</code>	comment style
<code>frame</code>	add a frame around source code
<code>morekeywords={...}</code>	add extra keywords
<code>numbers=left</code>	where to add line numbers
<code>numbersep</code>	how much space between numbers and code
<code>numberstyle</code>	set the style of the line numbers
<code>showspaces</code>	add underscores to show spaces
<code>showtabs</code>	add underscores to show tabs
<code>stepnumber</code>	how many lines between line numbers

# The listings package - options

So, for example, we could define some options for our code as:

```
\lstset{
  language=C
  backgroundcolor=\color{gray}
  frame=single,
  numbers=left,
  numbersep=6pt,
  numberstyle=\tiny\color{green},
  stepnumber=2,
  breaklines=true
}
```

## The listings package - styles

We can also define styles - or groups of options - so we can format individual pieces of code separately:

```
\lstdefinestyle{python}{  
    language=Python  
    backgroundcolor=\color{gray}  
    frame=single,  
    numbers=left,  
    numberstyle=\tiny\color{green},  
    stepnumber=2,  
}  
  
\lstdefinestyle{java}{  
    language=Java  
    backgroundcolor=\color{blue}  
    numbers=right,  
    numberstyle=\tiny\color{red},  
    stepnumber=1,  
}
```



# The listings package - styles

We can then use our different styles by specifying the style as an option on the listing environment:

# L<sup>A</sup>T<sub>E</sub>X Tips and Tricks

Use `\thispagestyle{empty}` to suppress page numbers on a page.

Use a starred version of a sectioning command to suppress numbering (`\section*{section_name}`).

Use `\marginpar{notes in margin}` to add some notes in the margin of a document - useful when commenting or giving feedback.

# L<sup>A</sup>T<sub>E</sub>X Tips and Tricks

Use the `hyperref` package to add hyperlinks and navigation in your .pdf output

```
\usepackage[pdftex,  
  pdfauthor={Martin Chorley},  
  pdftitle={Advanced LaTeX},  
  pdfpagelayout=TwoColumnRight,  
  pdfborder=0  
{hyperref}
```

# L<sup>A</sup>T<sub>E</sub>X Tips and Tricks

Use the `\input` command to include multiple L<sup>A</sup>T<sub>E</sub>X files within the same document.

This allows you to separate your document across multiple files.

```
\begin{document}  
  \input{introduction}  
  \input{results}  
  \input{conclusion}  
\end{document}
```

# L<sup>A</sup>T<sub>E</sub>X Tips and Tricks

Use the `\rotating` package to rotate items that are too wide to fit on a page.

```
\usepackage{rotating}
\begin{document}
  \begin{sideways}
    % table or item that is too wide goes here
  \end{sideways}
\end{document}
```

Page headers and footers are not affected, only the content within the `sideways` environment