

# How is L<sup>A</sup>T<sub>E</sub>X Useful

Will Anderson

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## List of Figures

# 1 How L<sup>A</sup>T<sub>E</sub>X Documents are laid out.

L<sup>A</sup>T<sub>E</sub>X Is a combination of written language and code, this can make reading some things more difficult, but when you understand L<sup>A</sup>T<sub>E</sub>X They will make much more sense, this guide is going to teach you about how L<sup>A</sup>T<sub>E</sub>X Documents are formed and what makes them great.

## 1.1 Document formatting

There are lots of ways to format your documents, such as title pages and putting content into your headers or footers, when it comes to putting content in your header or footer it is managed by a package, packages are little "Add-Ons" That are used in L<sup>A</sup>T<sub>E</sub>X and are how it functions with a lot of the things that I will describe in this document, however these packages will generally be pre-installed depending on the editor that you use to create L<sup>A</sup>T<sub>E</sub>X Documents.

### 1.1.1 What are sections?

Sections are the main part that get added to the table of contents, they are the top level and are used just like Headings in Word, you can call them with this command in your L<sup>A</sup>T<sub>E</sub>X Document

```
1 \section{Insert Section Title Here}
```

Sections are used to separate large differing subjects, if you want to differ between various points inside of certain subject you will be calling these commands, depending on which you want to use.

```
1 \subsection{Insert Subsection Title Here}
2 \subsubsection{Insert Subsubsection Title Here}
```

### 1.1.2 The Table Of Contents

The table of contents is the first thing I will talk about when it comes to document formatting since it is the first thing that people will see after they open the title page, also because it is one of the easiest things to talk about. The table of contents is called with this command,

```
1 \tableofcontents
```

Figure 1: Table of Contents Code

this is simple because it does not need to be modified, however it does have customisation options anyway, some of these customization options are as basic as changing the name of the table of contents, or drastic style changes, you can read more about theming the table of contents here, on [https://www.sharelatex.com/learn/Table\\_of\\_contents](https://www.sharelatex.com/learn/Table_of_contents)

### 1.1.3 Headers & Footers

Headers and footers are managed by the **fancyhdr** package, it is easy to understand when you see the syntax and have it explained to you, if you refer to the code below which is used in this very document.

```
1 \pagestyle{fancy}
2 \fancyhf{}
3 \rhead{\LaTeX{} – How is it useful?}
4 \lhead{Will Anderson – Barrel}
5 \rfoot{Page \textbf{\thepage} of \textbf{\pageref{LastPage}}}
```

Figure 2: Header &amp; Footer syntax for this document

Now this may look difficult but it's easy to explain, really.

The first line is talking about the pagestyle, this simply sets the style to "Fancy" easy stuff, right?

The second line is resets the layout, so that you can add your own stuff, this might be confusing, but it makes sense since the configuration comes after this.

The third line prints the text into the braces on the right side of the header, the fourth line does this as well, but on the left.

The fifth line is used to modify the right footer on your page, in this case it is used to show the page numbering in bold.

### 1.1.4 List Of Figures & List of Tables

There are two very simple commands to display a list of all of your figures and tables, just like with the table of contents they can be modified the same

way.

```
1 \listoffigures
2 \listoftables
```

These two commands will print every single figure and table, wherever you put them in the document.

## 2 Documents inside of L<sup>A</sup>T<sub>E</sub>X

You can insert different arbitrary files inside of L<sup>A</sup>T<sub>E</sub>X, the ones that I use the most are

- PDF's
- Images
- CSV's
- Python outputs

For the first two of these you can use the command below, which will allow you to easily insert images and other documents.

```
1 \includegraphics
2
```

## 3 Running python inside of L<sup>A</sup>T<sub>E</sub>X

This is a graph that was generated using python, this is the code used that you use to do so.

```
1 \begin{pycode}
2 from pylab import *
3 from matplotlib2tikz import save as tikz_save
4 x = linspace(0, 10, 101)
5 plot(x, sin(x))
6 xlabel('$x$-axis ')
7 ylabel('$y$-axis ')
8 tikz_save('fig.tikz ',
9           figureheight = '\\figureheight ',
10          figurewidth = '\\figurewidth ')
11 \end{pycode}
12
```

Figure 3: Python Code

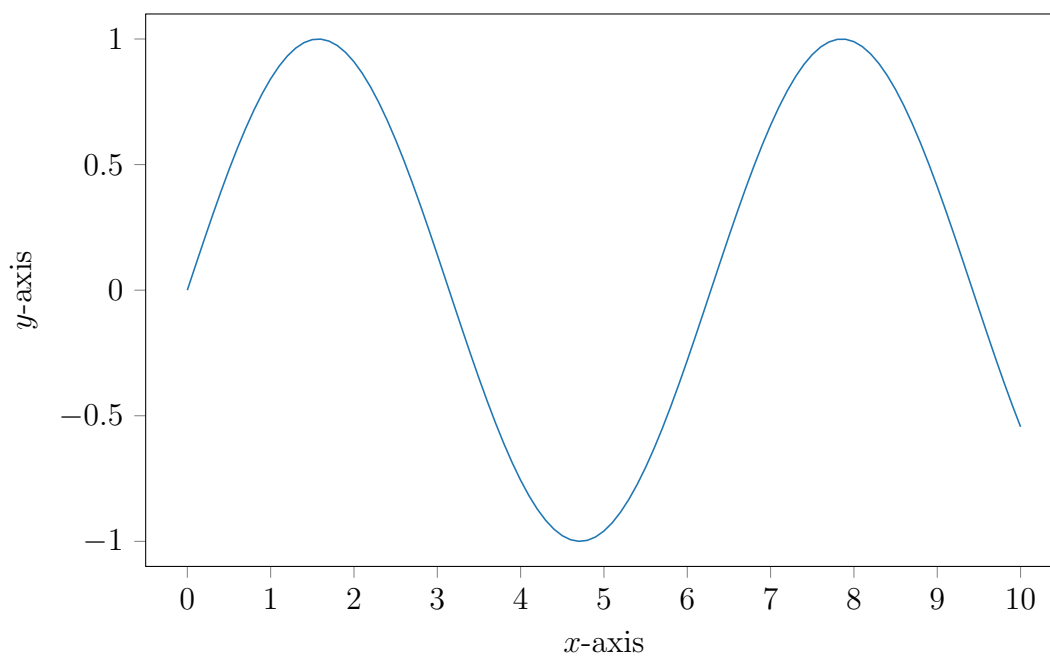


Figure 4: Graph Generated Using Python

### 3.1 The different packages for python inside of L<sup>A</sup>T<sub>E</sub>X

There are two main packages that you will use to run python inside of L<sup>A</sup>T<sub>E</sub>X, the first one is the *python* package and the second is the *pythontex* package.

## 4 Tables in L<sup>A</sup>T<sub>E</sub>X

Tables are very nice in L<sup>A</sup>T<sub>E</sub>X as they can be easily manipulated once you grasp the syntax and can be transplanted into any document and will still function, this is incredibly useful when transferring tables from someone else's work.

- Table
- Longtable
- Tabular

And these are all functionally different, the **table** command doesn't allow for separators so you're left with a table like this

cell1	cell2	cell3
cell4	cell5	cell6
cell7	cell8	cell9

Figure 5: A **table** table.

The code for this table is listed below.

```

1 \begin{center}
2 \begin{tabular}{c c c}
3 cell1 & cell2 & cell3 \\
4 cell4 & cell5 & cell6 \\
5 cell7 & cell8 & cell9
6 \end{tabular}
7 \end{center}
```

Figure 6: Code for a **table** table.

Now this isn't all that fancy, after all we are using a supposedly incredibly advanced typesetting language, so what do **longtable** and **tabular** do? Let's find out right now by inserting a table using the tabular environment.

cell1	cell2	cell3
cell4	cell5	cell6
cell7	cell8	cell9



```

1 \begin{center}
2 \begin{tabular}{|c|c|c|}
3 \hline
4 cell1 & cell2 & cell3 \\
5 cell4 & cell5 & cell6 \\
6 cell7 & cell8 & cell9 \\
7 \hline
8 \end{tabular}
9 \end{center}
10

```

Figure 7: Code for a vertically seperated table

This is much nicer, I can have separators in my cells so that it is clear which cell belongs which to which, however I don't have it so that they're in a proper grid, however that can easily be solved with a few horizontal lines which can be called like this.

```

1 \hline

```

cell1	cell2	cell3
cell4	cell5	cell6
cell7	cell8	cell9

```

1 \begin{center}
2 \begin{tabular}{|c|c|c|}
3 \hline
4 cell1 & cell2 & cell3 \\
5 \hline
6 cell4 & cell5 & cell6 \\
7 \hline
8 cell7 & cell8 & cell9 \\
9 \hline
10 \end{tabular}
11 \end{center}
12 \caption{Code for the grid layout table}

```

Standard:	Dull:	Dark:	Vibrant:	Pastel:
Primary Colours:				
Secondary (A) Colours:				
Secondary (B) Colours:				
Complimentary Colours:				

Figure 8: My color table that I used in another project.

Below is the syntax for it, at first it's kind of scary but the moment you read through it you understand it a lot better.

```

1
2 \begin{tabular}{| m{.15\linewidth} | m{.15\linewidth} | m{.15\linewidth} | m{.15\linewidth} | m{.15\linewidth} | }
3     \hline
4 \rowcolor{gray}Standard: & Dull: & Dark: & Vibrant: & Pastel: \\ \hline
5     \rowcolor{P5} \multicolumn{5}{c}{Primary Colours:} \\ \hline
6     \cellcolor{P1} & \cellcolor{P2} & \cellcolor{P3} & \cellcolor{P4} & \cellcolor{P5} \\
7     \hline
8     \rowcolor{A5} \multicolumn{5}{c}{Secondary (A) Colours:} \\ \hline
9     \cellcolor{A1} & \cellcolor{A2} & \cellcolor{A3} & \cellcolor{A4} & \cellcolor{A5} \\
10    \hline
11    \rowcolor{B5} \multicolumn{5}{c}{Secondary (B) Colours:} \\ \hline
12    \cellcolor{B1} & \cellcolor{B2} & \cellcolor{B3} & \cellcolor{B4} & \cellcolor{B5} \\
13    \hline
14    \rowcolor{C5} \multicolumn{5}{c}{Complimentary Colours:} \\ \hline
15    \cellcolor{C1} & \cellcolor{C2} & \cellcolor{C3} & \cellcolor{C4} & \cellcolor{C5} \\
16    \hline
17 \end{tabular}

```

Figure 9: The Syntax for my Colour Table

## 5 How I've been inserting code snippets

Now, you may be wondering how I've been inserting these random code snippets, because they're formatted so differently, the answer is simple, really, I'm using the ***lstlisting*** package, it's a package that is used to insert code snippets and can be manipulated extremely easily, it has a long list of languages that it supports, which can be found in the link below.

### Code Listing

Sadly very few of the things that you see in the code blocks are not default to *lstlisting*, however they are managed through a global style which I have pasted below.

```
1 \lstdefinestyle{mystyle}{
2     basicstyle=\footnotesize ,
3     breakatwhitespace=false ,
4     breaklines=true ,
5     captionpos=b,
6     keepspaces=true ,
7     numbers=left ,
8     numbersep=5pt ,
9     showspaces=false ,
10    showstringspaces=false ,
11    showtabs=false ,
12    tabsize=2
13 }
14
15 \lstset{style=mystyle}
16
```

Figure 10: Code Block for theming of code blocks

## 6 Inputting CSV Files into L<sup>A</sup>T<sub>E</sub>X

CSV Files are incredibly easy to manage because of their simplicity, and because of this there happen to be an incredibly simple way of importing them into L<sup>A</sup>T<sub>E</sub>X Documents, this is using the package *csvsimple*

Keyboard	Switch
Happy Hacking Keyboard Professional 2 Type-S JP	Topre
Ducky One	Cherry MX Blue
G80-1800	Cherry MX Black
DZ60	Gateron Black
Steelseries 6GV2	Cherry MX Black
GH60	Cherry MX Black
Corsair K95 RGB Platinum	Cherry MX Blue
Corsair K95 RGB Platinum	Cherry MX Brown
Corsair K95 RGB	Cherry MX Red
Pok3r	MX Clear
Coolermaster Masterkeys Pro M	MX Green
Dell AT102W	ALPS SKCM Black
IBM Model M	Membrane Buckling Spring
IBM Model F	Capacitive Buckling Spring
Razer Blackwidow Chroma	Razer Green
Matias Quiet Pro	Matias Quiet Click
Gherkin	Zealios
Leopold FC660C	Topre
Varmilio VA68M	Modded Cherry MX Black

Figure 11: Barrel's Keyboards (Incomplete)

Now, this may look like there's a lot to go here, seeing as there is a table and as we have shown previously tables usually require a lot of text, however the csvsimple package deals with it easily, here is the code for that entire table.

```
1 \csvautotabular{test.csv}
```

It seems almost too easy to simply get the content on the page, but that is *really* it, if you just want to insert it, you can manage it with the *csvreader* command.

## 7 Presentations

Presentations, the day I realised that I could be doing these in L<sup>A</sup>T<sub>E</sub>X. Was the day I stopped using Microsoft's Office software, I had virtually zero need for it as the only thing that I was really lacking was a competent slideshow program, you can use presentations using the **beamer** package, it's incredibly powerful and can easily be themed, it can also be used with markdown if you want to quickly make a presentation.

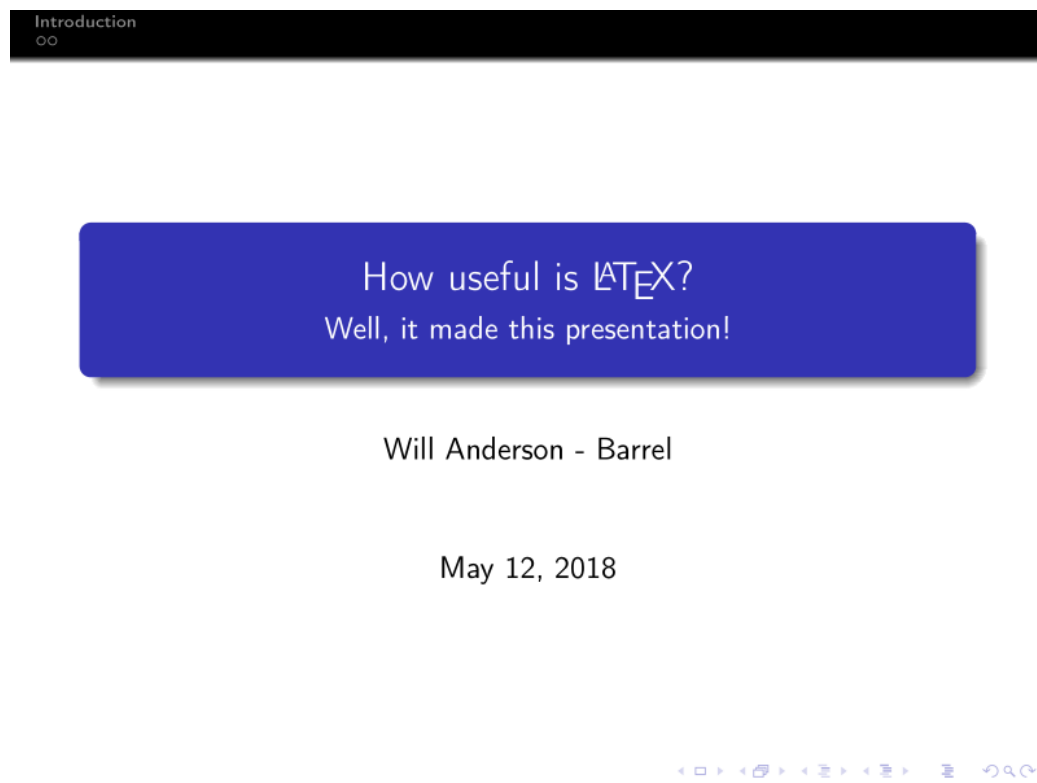


Figure 12: A Title page made with L<sup>A</sup>T<sub>E</sub>X and Beamer

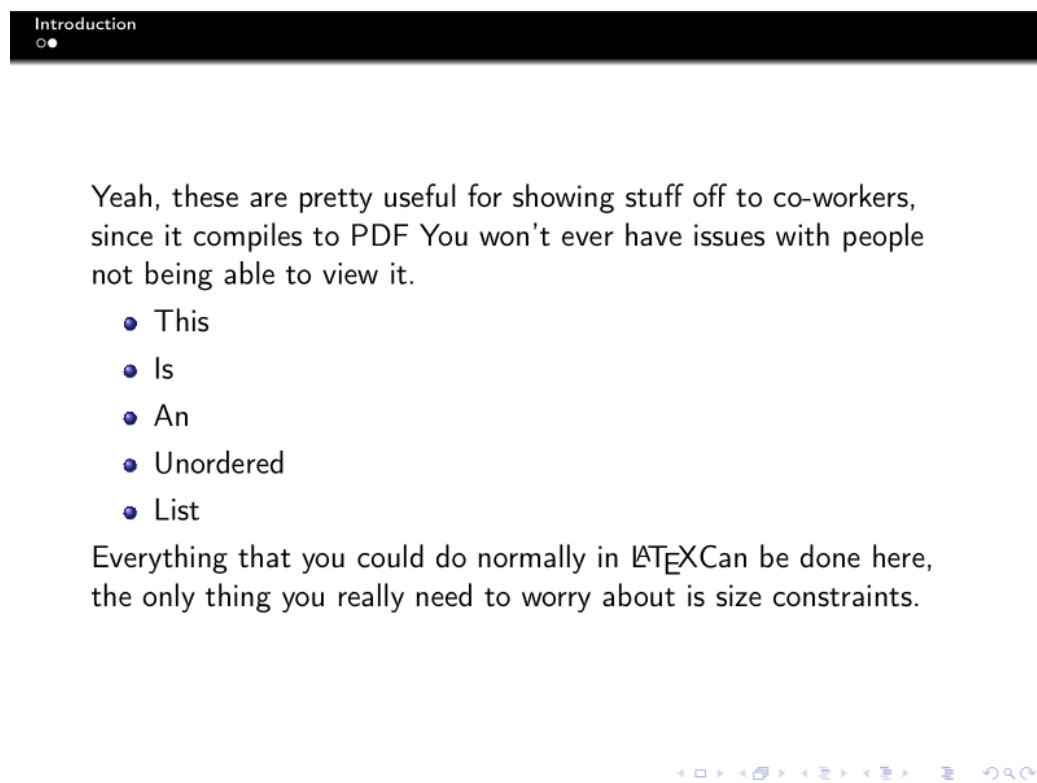
Introduction

Pretend I could come up with a name.

Hey, you rememebr that CSV I was showing off earlier? Sure, it might not fit on the page but it works in here because it's simply beamer using L<sup>A</sup>T<sub>E</sub>X as a backend.

Keyboard	Switch
Happy Hacking Keyboard Professional 2 Type-S JP	Topre
Ducky One	Cherry MX Blue
G80-1800	Cherry MX Black
DZ60	Gateron Black
Steelseries 6GV2	Cherry MX Black
GH60	Cherry MX Black
Corsair K95 RGB Platinum	Cherry MX Blue
Corsair K95 RGB Platinum	Cherry MX Brown
Corsair K95 RGB	Cherry MX Red
Pok3r	MX Clear
Coolermaster Masterkeys Pro M	MX Green
Dell AT102W	ALPS SKCM Black
IBM Model M	Membrane Bucklin

Figure 13: The second page made with L<sup>A</sup>T<sub>E</sub>X and Beamer



Introduction  
●

Yeah, these are pretty useful for showing stuff off to co-workers, since it compiles to PDF You won't ever have issues with people not being able to view it.

- This
- Is
- An
- Unordered
- List

Everything that you could do normally in L<sup>A</sup>T<sub>E</sub>X Can be done here, the only thing you really need to worry about is size constraints.

Navigation icons: back, forward, search, etc.

Figure 14: The third page made with L<sup>A</sup>T<sub>E</sub>X and Beamer