

# Writing papers and thesis using $\text{\LaTeX}2\text{e}$

## Part II: Writing papers and thesis using $\text{\LaTeX}$

Krishna Kumar <sup>\*1</sup>

<sup>1</sup>King's College  
University of Cambridge

$\text{\LaTeX}$ for Beginners

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<sup>1</sup>kks32@cam.ac.uk

# Figures

- $\text{\LaTeX}$  can be easily extended using a *package* to typeset images.
- To use graphics in your  $\text{\LaTeX}$  document use `\usepackage{graphicx}`
- Always use relative scaling to specify the width of the figure, i.e.,  
`[width = 0.75\textwidth]`
- Never ever use absolute values to scale your images!
- Set either the width or the height of the image. Or use `scale`

```
\begin{figure}  
\includegraphics[width=0.75\textwidth]  
                {figs/minion}  
\end{figure}
```



# Figures

- For captioning a figure, you can use `\usepackage{caption}`
- tweak the location, label, separator: `[labelsep=space, tableposition=top]{caption}`
- I prefer to centre the figure. To do that use `\centering`
- You can use `\cref{fig:minion}` to cross reference the figure. Requires package `cleveref`

```
\begin{figure}
\centering
\includegraphics[width=0.75\textwidth]
                 {figs/minion}

\caption[Minion]{
Dave the Minion from Despicable Me!}
\label{fig:minion} % Unique identifier
                   % for cross-reference

\end{figure}
```



Figure: Dave the Minion from Despicable Me!

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Parameter	Position
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<code>h</code>	Place the float here, i.e., approximately at the same point it occurs in the source text (however, not exactly at the spot)
<code>t</code>	Position at the top of the page.
<code>b</code>	Position at the bottom of the page.
<code>p</code>	Put on a special page for floats only.
<code>!</code>	Override internal parameters LaTeX uses for determining "good" float positions.
<code>H</code>	Places the float at precisely the location in the LaTeX code. Requires the float package. This is somewhat equivalent to <code>h!</code>

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# Subcaption

I can cite Wall-E (see fig. 2b) and Minions in despicable me (fig. 2c). Figure 2 lets me cite the whole figure.

```
\begin{figure}
\centering
\begin{subfigure}[b]{0.3\textwidth}
\includegraphics[width=\textwidth]
{figs/TomandJerry}
\caption{Tom and Jerry}
\label{fig:TomJerry}
\end{subfigure}
\begin{subfigure}[b]{0.3\textwidth}
\includegraphics[width=\textwidth]{figs/WallE}
\caption{Wall-E}
\label{fig:WallE}
\end{subfigure}
\begin{subfigure}[b]{0.3\textwidth}
\includegraphics[width=\textwidth]{figs/minion}
\caption{Minions}
\label{fig:Minnion}
\end{subfigure}
\caption{Best Animations}
\label{fig:animations}
\end{figure}
```

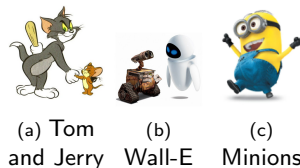


Figure: Best Animations

# Exercise 6: Pictures

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- In write $\text{\LaTeX}$  create a new folder `figs` and move your figures in to `figs` folder.
- Format the King's college picture. Change it's location: (top, bottom, here, new page) and rescale the figure.
- Arrange Tom, Walle and Dave inside a single figure environment vertically.
- Cross-reference the figures (using `cleveref`).
- Create a list of figures. Use `\listoffigures`.

Click to open my solution

# Tables

- Tables in  $\text{\LaTeX}$  take some getting used to.
- The argument specifies column alignment — left, center, right.

```
\begin{tabular}{lcr}  
Item & Qty & Unit \ $ \\  
Widget & 1 & 199.99 \\  
Gadget & 2 & 399.99 \\  
Cable & 3 & 19.99 \\  
\end{tabular}
```

Item	Qty	Unit \$
Widget	1	199.99
Gadget	2	399.99
Cable	3	19.99

- Don't use vertical lines, it's ugly. Use `\begin{booktabs}` to create horizontal lines. Never use `\hline`

```
\begin{table}[h]  
\caption{Cost}  
\begin{tabular}{lrr} \toprule  
Item & Qty & Unit \ $ \ \midrule  
Widget & 1 & 199.99 \\  
Gadget & 2 & 399.99 \\  
Cable & 3 & 19.99 \ \bottomrule  
\end{tabular}  
\label{t:cost}  
\end{table}
```

Table: Cost

Item	Qty	Unit \$
Widget	1	199.99
Gadget	2	399.99
Cable	3	19.99

- Use an ampersand `&` to separate columns and a double backslash `\` to start a new row (like in the `align*` environment that we saw in part 1).

# Table Environment

Option	Description
<code>l</code>	left-justified column
<code>c</code>	centered column
<code>r</code>	right-justified column
<code>p{'width'}</code>	paragraph column with text vertically aligned at the top
<code>m{'width'}</code>	paragraph column with text vertically aligned in the middle
<code>b{'width'}</code>	paragraph column with text vertically aligned at the bottom
<code>\&amp;</code>	column separator
<code>\\</code>	start new row (additional space may be specified)
<code>\cmidrule{i-j}</code>	partial horizontal line beginning in column i and ending in column j



# Exercise 7: Tables

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- Use `tabularx` package for tables with paragraph text.
- Never use `\hline` or `\cline`, use `\toprule`, `\midrule`, `\bottomrule` and `\cmidrule{i-j}`
- Visual table editor: <http://truben.no/table/>

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- Put your references in a .bib file in ‘bibtex’ database format:

```
@Article{Jacobson1999Towards,
  author = {Van Jacobson},
  title = {Towards the Analysis of Massive Multiplayer Online
           Role-Playing Games},
  journal = {Journal of Ubiquitous Information},
  Month = jun,
  Year = 1999,
  Volume = 6,
  Pages = {75--83}}

@InProceedings{Brooks1997Methodology,
  author = {Fredrick P. Brooks and John Kubiawicz and
           Christos Papadimitriou},
  title = {A Methodology for the Study of the
           Location-Identity Split},
  booktitle = {Proceedings of OOPSLA},
  Month = jun,
  Year = 1997}
```

- Most reference managers can export to bibtex format.

- Each entry in the .bib file has a *key* that you can use to reference it in the document. For example, Jacobson1999Towards is the key for this article:

```
@Article{Jacobson1999Towards,
  author = {Van Jacobson},
  ...
}
```

- It's a good idea to use a key based on the name, year and title.
- L<sup>A</sup>T<sub>E</sub>X can automatically format your in-text citations and generate a list of references; it knows most standard styles, and you can design your own.

- Use the natbib package<sup>2</sup> with `\citet` and `\citep` for textual and parenthetical citations, respectively.
- Reference `\bibliography` at the end, and specify a `\bibliographystyle`.

```
\documentclass{article}
\usepackage[authoryear]{natbib}
\begin{document}

\citet{Brooks1997Methodology}
show that \ldots. Clearly,
all odd numbers are prime
\citep{Jacobson1999Towards}.

\bibliography{bib-example}
% if 'bib-example' is the name of
% your bib file

\bibliographystyle{plainnat}
% try changing to abbrunat

\end{document}
```

Brooks et al. [1997] show that .... Clearly, all odd numbers are prime [Jacobson, 1999].

## References

Fredrick P. Brooks, John Kubiawicz, and Christos Papadimitriou. A methodology for the study of the location-identity split. In *Proceedings of OOPSL* June 1997.

Van Jacobson. Towards the analysis of massive multiplayer online role-play games. *Journal of Ubiquitous Information*, 6:75–83, June 1999.

<sup>2</sup>There is a new package with more features named bibl<sub>a</sub>TeX but most of the articles templates still use natbib.

# Exercise 8: Formatting a Paper

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- Reference styles: <http://sites.stat.psu.edu/~surajit/present/bib.htm>
- Bibliography style previews: <http://nodonn.tipido.net/bibstyle.php>

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# PhD Thesis Template

Detailed instructions on how to use the template

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Click to open the template in **Overleaf**

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or use it off-line

View the template in github