

Writing papers and thesis using L^AT_EX2e

Part II: Writing papers and thesis using L^AT_EX

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Figures

- \LaTeX can be easily extended using a *package* to typeset images.
- To use graphics in your \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.

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

\caption[Minion]{
Dave the Minion from Despicable Me!}
\label{fig:minion}
\end{figure}
```



Figure: Dave the Minion from Despicable Me!

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

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

Click to open this exercise in **wriTe_LA_TE_X**

- Please upload the figures in **figs/** to the write_LA_TE_Xproject. or point to raw URLs on github.
- Format these the King's college picture. Change it's location: (top, bottom, here, new page)
- Arrange Tom, Walle and Dave inside a single figure environment vertically.
- Use Fig. to refer to figures
- Create a list of figures.

Click to open my solution.

Tables

- Tables in \LaTeX take some getting used to.
- The argument specifies column alignment — left, right, 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>\&</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

Click to open this exercise in **write \LaTeX**

- 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/>

Click to open my solution.

- 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^AT_EX 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 package² with `\citet` and `\citep`.
- 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 abbrvnat

\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-playing games. *Journal of Ubiquitous Information*, 6:75–83, June 1999.

²There is a new package with more features named biblatex but most of the articles templates still use natbib.

Exercise 8: Bibliography

Click to open this exercise in **write \LaTeX**

- 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/>

Click to open my solution.