

L^AT_EX

Introductory workshop

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Overview

1. Introduction.
2. Example work-through: A simple article in L^AT_EX.
3. Preparing manuscripts for journals.
4. Presentations and posters with L^AT_EX.
5. Some useful tricks and further sources of information.

Introduction

Paradigms of document editing

WYSIWYG: What You See Is What You Get.

Examples: MS Word, Power Point.

WYSIWYM: What You See Is What You Mean.

- ▶ Edited content (*source*) is marked according to its structural meaning (e.g. *title*, *author name*, *chapter*).
- ▶ A typesetter translates *source* to the final document, according to certain rules.
- ▶ Rules can be changed independently of content.
- ▶ Author concentrates on content, rather than appearance (e.g. spacings, text sizes).

Examples: XML, Wiki markup, L^AT_EX.

An example in L^AT_EX

L^AT_EX source

```
\section{Materials and methods}
\subsection{Theoretical approach}
We use the theory of everything and Einstein's formula  $E = mc^2$  to prove the
existence of the Flying Spaghetti Monster\footnote{The authors claim no
correctness of their results.}.
```

An example in L^AT_EX

L^AT_EX source

```
\section{Materials and methods}
\subsection{Theoretical approach}
We use the theory of everything and Einstein's formula  $E = mc^2$  to prove the
existence of the Flying Spaghetti Monster\footnote{The authors claim no
correctness of their results.}.
```

corresponds to output:

1 Materials and methods

1.1 Theoretical approach

We use the theory of everything and Einstein's formula $E = mc^2$ to prove the existence of the Flying Spaghetti Monster¹.

¹The authors claim no correctness of their results.

Strengths of L^AT_EX

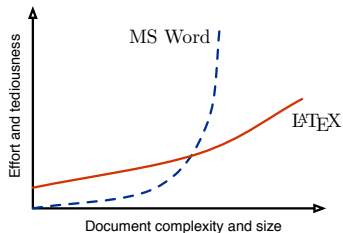
- ▶ Open source, available on most operating systems.
- ▶ No *file corruption* or *version incompatibilities*.
- ▶ Automation through macros and other programmatic features.
- ▶ Excellent mathematical typesetting.
- ▶ Excellent for writing scientific reports, articles, books.
- ▶ Can be used to write presentations, letters, screenplays, posters, music notation.

Weaknesses of L^AT_EX

- ▶ Steeper learning curve, code sometimes hard to read.

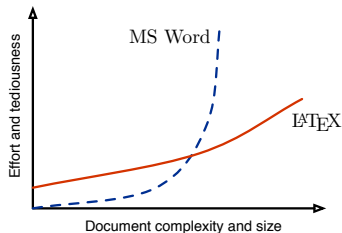
Weaknesses of L^AT_EX

- ▶ Steeper learning curve, code sometimes hard to read.



Weaknesses of L^AT_EX

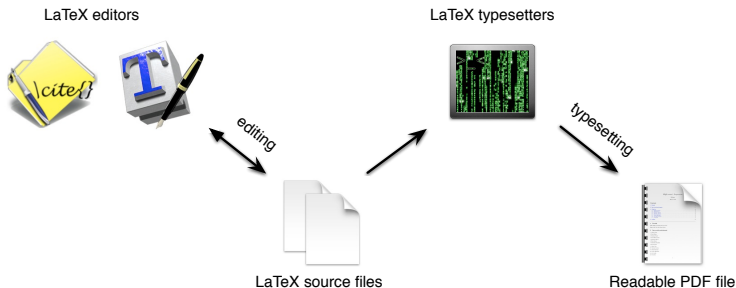
- ▶ Steeper learning curve, code sometimes hard to read.



- ▶ Not everybody *knows* L^AT_EX (in the worst case, your boss).

Using LaTeX: Basic requirements

1. A LaTeX distribution, i.e. the typesetting programs used to translate LaTeX source files to beautiful documents.
Examples: MacTeX on Mac, TeX Live on Linux, MiKTeX on Windows.
2. A LaTeX editor for editing source files: Any text editor will work. Editors created especially for LaTeX are highly recommended, as they often provide automated typesetting & PDF preview. But these features may require some configuration (e.g. *tell* editor where LaTeX distribution was installed).



L^AT_EX distributions and editors: Suggestions



MacTeX 2013

Download and install the complete 2.3 GB package.
Ready to use with included TeXShop editor (my personal favorite).



Install the complete [MiKTeX distribution](#).

MiKTeX should come with TeXworks, a nice simple editor.
A sophisticated editor: [Texmaker](#).



TeX Live distribution typically pre-installed.
If not, use `sudo apt-get install texlive`.
Popular editors are [Kile](#) and [Texmaker](#).

Example work-through: A simple article in L^AT_EX

Step 1

- ▶ Grab your laptop and open your favorite L^AT_EX editor (I will be using TeXShop).
- ▶ Create an empty `.tex` document and save it in a new directory, for example as **Article.tex**. This will be the L^AT_EX *source file*.
- ▶ If you had troubles configuring your L^AT_EX editor, you will be using the command line typesetting tools. In this case, open your terminal and `cd` into your working directory.

Some principles before we get started

- ▶ L^AT_EX commands start with a backslash ‘\’.
- ▶ Mandatory arguments to commands *usually* given in curly brackets ‘{ }’.
- ▶ Line breaks, [hyphenation](#) and [justification](#) are automatic.
- ▶ Most excess white-space is ignored. Hence,

```
The      Flying  
Spaghetti  
  Monster
```

is the same as

```
The Flying Spaghetti Monster
```

- ▶ Some characters (e.g. #, \, &, \$) are reserved and must be *escaped*.
- ▶ Comments start with ‘%’.

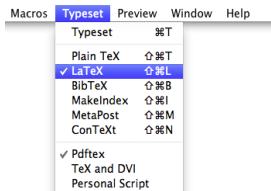
Step 2: Minimal working example

Insert code (**comments** can be ignored)

```
\documentclass{article} % Specify the document class. Must come first.
\title{The Flying Spaghetti Monster}
\author{Me, myself et al.}
\date{\today}

\begin{document} % Marks the beginning of the article's content
\maketitle      % Print out title page
\end{document}  % Marks the end of the article's content
```

and run L^AT_EX (pdf_latex) typesetter.



If using the command line tools, run `pdflatex Article.tex`.

Minimal working example: Expected output

The Flying Spaghetti Monster

Me, myself et al.

October 6, 2013

Step 3: Text structure

- ▶ Defined using commands like `\chapter{..}`, `\section{..}`, `\subsection{..}` and `\subsubsection{..}`.
- ▶ Table of contents generated using `\tableofcontents`.

Text structure: Example

Insert code

```
\tableofcontents % Generate table of contents
\newpage         % Force change page

\section{Introduction}

\subsection{History}

\subsection{Dogma}

\subsection{Pirates and global warming}
Pirates are absolutely divine beings and their decline is a direct cause of
global warming. Indeed, Somalia has the highest number of pirates and the
lowest carbon emissions of any country.

\subsection{The myth of evolution}
All evidence for evolution was placed by the Flying Spaghetti Monster to test
the faith of its followers. Scientific measurements such as radiocarbon dating,
are constantly changed by the Flying Spaghetti Monster.
```

right below the `\maketitle` command in the previous example. Run typesetter twice.

Text structure: Expected output

The Flying Spaghetti Monster

Me, myself et al.

October 6, 2013

Contents

1 Introduction	2
1.1 History	2
1.2 Dogma	2
1.2.1 Pirates and global warming	2
1.2.2 The myth of evolution	2

1 Introduction**1.1 History****1.2 Dogma****1.2.1 Pirates and global warming**

Pirates are absolutely divine beings and their decline is a direct cause of global warming. Indeed, Somalia has the highest number of pirates and the lowest carbon emissions of any country.

1.2.2 The myth of evolution

All evidence for evolution was placed by the Flying Spaghetti Monster to test the faith of its followers. Scientific measurements such as radiocarbon dating, are constantly changed by the Flying Spaghetti Monster.

Step 4: Tables

- ▶ Are created using the `tabular` environment.
- ▶ Are usually enclosed by a `table` environment, which allows for referencing, captions and dynamic positioning.

Tables: Example

Insert code

See table `\ref{TABLE:PIRATES}` for supporting data.

```

\begin{table}[h] % Treat table as floating entity
\begin{center} % Center-align table

  \begin{tabular}{ccc} % 3 columns with center alignment
    Year & ENOP & & GAT\\ % Columns are separated using '&'
    \hline % Draw a horizontal line
    1820 & 35000 & & 14.2\\ % Rows are separated using '\\ '
    1880 & 20000 & & 14.6\\
    1920 & 15000 & & 14.9\\
    2000 & 17 & & 15.8
  \end{tabular}

\end{center}
\caption{Estimated number of pirates (ENOP) and global average temperature (GAT)
) at varying times.} % Give table a short caption
\label{TABLE:PIRATES} % Label table for future reference
\end{table}

```

right below the text “of any country.” in the previous example. Run typesetter twice.

Tables: Expected output

1.2.1 Pirates and global warming

Pirates are absolutely divine beings and their decline is a direct cause of global warming. Indeed, Somalia has the highest number of pirates and the lowest carbon emissions of any country. See table 1 for supporting data.

Year	ENOP	GAT
1820	35000	14.2
1880	20000	14.6
1920	15000	14.9
2000	17	15.8

Table 1: Estimated number of pirates (ENOP) and global average temperature (GAT) at varying times.

Tables from CSV files

- ▶ LaTeX can include CSV files as tables, e.g. using the package `csvsimple`.
- ▶ Copy the CSV file `Pirates.csv` from the directory “Auxiliary files for workshop” into your L^AT_EX project directory.
- ▶ In your document header, add the line

```
\usepackage{csvsimple} % Load package for simple CSV file handling
```

- ▶ Replace the recently entered `tabular` environment with

```
\csvreader[tabular=ccc,table head= Year & ENOP & GAT\\ \hline]{Pirates.csv} % CSV file path{Year=\year, ENOP=\enop, GAT=\gat} % Define data column names{\year & \enop & \gat} % Structure of table rows
```

- ▶ This generates the same output as when we manually typed in the table's contents!

Tables: Alternatives

- ▶ Other packages for importing CSV files include `pgfplotstable`, `csvtools`.
- ▶ There are many scripts out there for this task as well (google “CSV to LaTeX”).
- ▶ One can also save R objects as L^AT_EX tables. See *Appendix: Some useful tricks*.

Step 5: Figures

- ▶ Are loaded using the `\includegraphics` command.
- ▶ Are usually enclosed by a `figure` environment, which allows for referencing, captions and dynamic positioning.
- ▶ Require package `graphicx`.

Figures: Example

- ▶ Copy the figure `GlobalWarming.pdf` from the directory “Auxiliary files for workshop” into your L^AT_EX project directory.
- ▶ In your document header, add the line

```
\usepackage{graphicx} % Load package for handling graphics
```

- ▶ Insert code

```
Also see figure \ref{FIGURE:PIRATES} for an illustration.  
\begin{figure}[h] % Treat figure as a floating entity  
\begin{center} % Center-align figure  
  
% Load graphic from file and adjust width:  
\includegraphics[width=0.5\textwidth]{GlobalWarming.pdf}  
  
\end{center}  
\caption{Pirates and global temperature.} % Give figure a short caption  
\label{FIGURE:PIRATES} % Label figure for future reference  
\end{figure}
```

between the paragraph on “Pirates and global warming” and the table from the previous example. Run typesetter twice.

Figures: Expected output

carbon emissions of any country. See table 1 for supporting data. Also see figure 1 for an illustration.

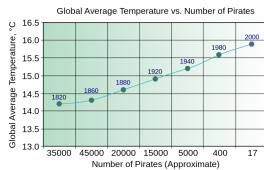


Figure 1: Pirates and global temperature.

Step 6: Lists

- ▶ Can be generated using the `itemize`, `enumerate` or `description` environments.
- ▶ List entries added using `\item` command.

Lists: Example

Insert code

```
In fact, the shrinking number of pirates is responsible for
\begin{itemize}
\item global warming,
\item earthquakes,
\item hurricanes
\item and other natural disasters
\end{itemize}
since the 1800s.
```

between the paragraph on “Pirates and global warming” and the figure from the previous example. Run typesetter.

Lists: Expected output

carbon emissions of any country. See table 1 for supporting data. Also see figure 1 for an illustration. In fact, the shrinking number of pirates is responsible for

- global warming,
- earthquakes,
- hurricanes
- and other natural disasters

since the 1800s.

Lists: Alternative

What happens if you change

```
\begin{itemize}  
...  
\end{itemize}
```

to

```
\begin{enumerate}  
...  
\end{enumerate}
```

in the previous example?

Step 7: Formulas

- ▶ Are always written in *math mode*.
- ▶ Inline math enclosed between `$` `$`.
- ▶ Displayed math (i.e. on a separate line) enclosed between `\[` `\]`.
- ▶ More sophisticated math modes available through `equation` or `align` environments.

Formulas: Example

Insert code

```
Hence, the total number of disasters so far,  $\Omega_{\text{now}}$ , is given by
\begin{equation}
  \label{EQUATION:DISASTERS} % Label equation for future reference
  \Omega_{\text{now}} = \Omega_{\text{old}} + \int_{1800}^{2013} e^{-P(t)} dt,
\end{equation}
where  $P(t)$  is the number of pirates at time  $t$ . Equation (\ref{EQUATION:
DISASTERS}) is known as the \emph{principle of accumulation of disasters}.
```

right after the text “since the 1800s.” from the previous example. Run typesetter twice.

Formulas: Expected output

since the 1800s. Hence, the total number of disasters so far, Ω_{now} , is given by

$$\Omega_{now} = \Omega_{old} + \int_{1800}^{2013} e^{P(t)} dt, \quad (1)$$

where $P(t)$ is the number of pirates at time t . Equation (1) is known as the *principle of accumulation of disasters*.

Custom commands

- ▶ Usually defined in document header (i.e. before `\begin{document}`).
- ▶ General syntax:

```
% Define new custom command  
\newcommand{\NewCommandName}[number of arguments]{code}  
  
% Replace existing command  
\renewcommand{\ExistingCommandName}[number of arguments]{code}
```

- ▶ Command arguments are referred to as #1, #2, ...

Custom commands: Example

- ▶ The code

```
\usepackage{color} % Additional package needed to work with colors
\newcommand{\Boss}[1]{\bf \color{red} Comment by boss: \emph{#1}}
```

defines a command for bold, red comments.

- ▶ Using `\Boss{Where did you get this stuff?}` in the text, gives something like

1.2.1 Pirates and global warming

Pirates are absolutely divine beings and their decline is a direct cause of global warming. **Comment by boss: *Where did you get this stuff?*** Indeed, Somalia has the highest number of pirates and the lowest carbon emissions of any country. See table 1 for supporting data. Also see figure 1 for an illustration.

Step 8: Bibliography

Involves two things:

- ▶ Getting bibliography entries listed in the document, each one identified with unique citation-key.
- ▶ Citing entries in the text using `\cite{. .}`, or variants.

Simple bibliography using thebibliography: Example

Insert code

```
% Define custom command '\book' for generating book entries with custom format
% Our \book command shall take 5 arguments:
%   citation-key, authors, date, title, publisher
% and use them to generate a nice bibliography entry
\newcommand{\book}[5]{\bibitem{#1}#2 (#3), {\em #4}, #5}

% List bibliography (two books) using \book command
\begin{thebibliography}{99}

\book{Henderson2006}{Henderson, B.}{2006}{The Gospel of the Flying Spaghetti
Monster}{Villard Books}
\book{Maslin2007}{Maslin, M.}{2007}{Global Warming}{Voyageur Press}

\end{thebibliography}
```

at bottom, right before `\end{document}`. Run typesetter.

Simple bibliography using thebibliography: Expected output

References

- [1] Henderson, B. (2006), *The Gospel of the Flying Spaghetti Monster*, Villard Books
- [2] Maslin, M. (2007), *Global Warming*, Voyageur Press

Now cite one of these books somewhere in your text, i.e. using `\cite{Henderson2006}` or `\cite{Maslin2007}`. What do you see?

Simple bibliography using thebibliography: Verdict

Advantages:

- ▶ Conceptually simple.
- ▶ Self-contained (everything in one source file).
- ▶ Requires no external packages.

Drawbacks:

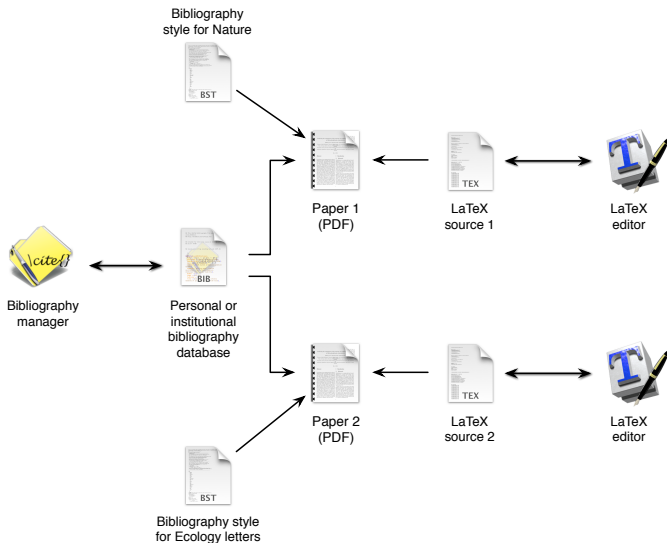
- ▶ Very cumbersome for large bibliographies.
- ▶ Entries have to be manually typed in for every article.
- ▶ No automatic adaptation if bibliography changes.
- ▶ No automatic ordering.

Step 9: Advanced bibliography using BibT_EX

Idea:

- ▶ Keep unformatted bibliographic entries in separate database (e.g. at lab level), independent of current article.
- ▶ Only list bibliography that's actually cited in article.
- ▶ Appearance of listed bibliography defined by separate *style file* (e.g. designed for a specific journal).

Bibliography using BibTeX: Overview



Bibliography using BibT_EX: Example

- ▶ Copy the bibliography database `bibliography.bib` and the bibliography style file `bibstyle.bst` from the directory “Auxiliary files for workshop” into your project directory.
- ▶ Some database entries are Henderson2006, Maslin2007, Treves2009. Try citing them in your text, using `\citep{..}`, `\citet{..}` and `\citeauthor{..}` respectively.
- ▶ Replace bibliography code from previous example with

```
\bibliographystyle{bibstyle} % Tell LaTeX what style to use  
\bibliography{bibliography} % Tell LaTeX what database to use
```

and insert

```
\usepackage{natbib} % Package for advanced bibliography
```

in your document header.

Bibliography using BibT_EX: Compiling

Now this is a bit tricky:

- ▶ Run LaTeX typesetter once, then BibT_EX once, then LaTeX twice.
- ▶ If you are using the command line tools, run

```
pdflatex Article.tex
bibtex Article.aux
pdflatex Article.tex
pdflatex Article.tex
```

Bibliography using BibT_EX: Expected output

References

Maslin, M., 2007. Global Warming: Causes, Effects, and the Future. World life library, Voyageur Press.

Treves, T., 2009. *Piracy, law of the sea, and use of force: developments off the coast of somalia*. European Journal of International Law 20, 399–414.

Only cited bibliography appears! Check out the format of your in-text citations.

Preparing manuscripts for journals

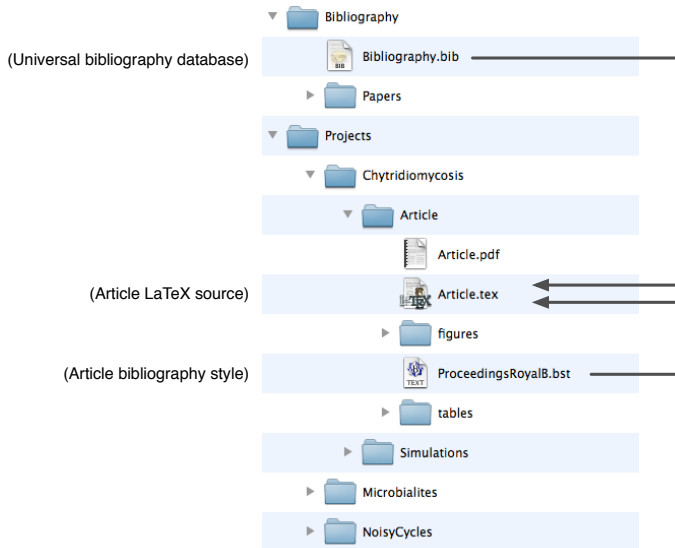
Preparing manuscripts for journals

- ▶ Separation of layout and content makes L^AT_EX suitable for high-quality, standardized publishing.
- ▶ Publisher provides layout specifications (e.g. bibliography style files, document class files).
- ▶ Author provides content (e.g. L^AT_EX sources, bibliography database).

Example: Journal of Theoretical Biology

- ▶ Provides document class file (`elsarticle.cls`) → defines article layout.
- ▶ Provides bibliography style file (`model2-names.bst`).

The way I do it



Creating your own .bst files

- ▶ Unfortunately, some journals do not yet provide their own bibliography styles.
- ▶ Authors are left with the following options:
 - ▶ Create a suitable .bst file from scratch, e.g. using the `makebst` program.
 - ▶ Find a suitable .bst file online or from colleague.
 - ▶ Find and manually modify (hack) an almost-suitable .bst file.
- ▶ The good news: You only have to do this once for every journal.

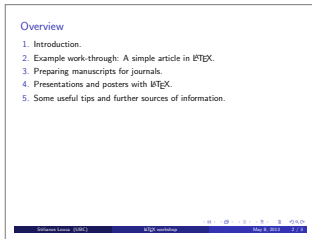
Presentations with L^AT_EX

Presentations with L^AT_EX: Simple approach

- ▶ Use `beamer` document class and `pdflatex` to create presentations as PDFs.
- ▶ Choose one of several built-in themes and color themes using the `\usetheme{..}` and `\usecolortheme{..}` commands.
- ▶ For example,

```
\documentclass{beamer}  
\usetheme{Madrid}  
\usecolortheme{lily}
```

defines the theme



- ▶ Demos of all 375 possible theme and color theme combinations can be found [here](#).

Creating slides

- ▶ As with all content, slides are defined between `\begin{document}` and `\end{document}`.
- ▶ Define individual slides using the `frame` environment, as

```
\begin{frame}[t]{Frame Title} % 't' for top vertical alignment  
  % Slide contents  
\end{frame}
```

- ▶ Frame content can include text, graphics, formulas, lists.. anything.
- ▶ Front slide created using

```
\begin{frame}  
  \titlepage  
\end{frame}
```

or short, `\frame{\titlepage}`.

Multi-column slides

- ▶ Define multiple columns within a frame using the `columns` and `column` environments, e.g.

```
\begin{frame}{Multi-column slide}
\begin{columns}[T] % 'T' for top vertical alignment

  \begin{column}{0.5\textwidth}
    % Contents of left column
    \begin{itemize}
      \item As you can see in the awesome figure on your right..
      \item Similar results have been obtained for..
    \end{itemize}
  \end{column}

  \begin{column}{0.5\textwidth}
    % Contents of right column.. e.g. a figure
  \end{column}

\end{columns}
\end{frame}
```

Blocks within slides

- ▶ Use blocks to distinguish parts of a single slide.
- ▶ Default block layout depends on beamer theme.
- ▶ Use as

```
\begin{frame}{Multi-block slide}

  \begin{block}{Block Title}
    What a boring block!
  \end{block}

  \begin{exampleblock}{An example block}
    A not so boring block..
  \end{exampleblock}

  \begin{alertblock}{An alert block}
    A somewhat interesting block..
  \end{alertblock}

\end{frame}
```

Posters

- ▶ In principle presentations with a single, big slide.
- ▶ Use columns and blocks to create different parts of the poster.
- ▶ Requires some effort until you *get it right*, but then available for future posters.
- ▶ Yes, you can have my poster template.

Exercise

- ▶ Create a simple presentation using the `beamer` document class and a theme of preference.
- ▶ Include a front slide and a couple of additional slides.
- ▶ Include at least one multi-column slide.
- ▶ Your code should look similar to

```
\documentclass{beamer}
\usetheme{..}
\usecolortheme{..}

\author{..}
\title{..}
\date{..}

\begin{document}
\frame{\titlepage} % front slide

% code for slide 1
..
% code for slide 2
..
\end{document}
```

Appendix: Some useful tricks

Installing new L^AT_EX packages (Mac)

- ▶ Move packages to

```
/usr/local/texlive/texmf-local/tex/latex
```

- ▶ Run

```
sudo mktexlsr
```

to update L^AT_EX hash tables.

- ▶ More info [here](#).

Forcing placement of floats

- ▶ Although not recommended, you can force the placement of floats (such as figures and tables) to a specific spot.
- ▶ For that, load the `float` package and use the `H` placement specifier, e.g. as in

```
\begin{figure}[H]  
..  
\end{figure}
```

More info [here](#).

- ▶ Once can also enforce the placement of figures before a certain barrier (e.g. before the appendix).
- ▶ For that, load the `placeint` package and use

```
\FloatBarrier
```

in your text.

Numbering only equations referenced in the text

- ▶ You can have equations automatically numbered whenever (and only when) they are referenced in the text.
- ▶ Include

```
\usepackage{mathtools}  
\mathtoolsset{showonlyrefs}
```

in the source header and use `\eqref{EQUATION_LABEL}` to reference equations.

- ▶ To force-label an equation without referencing it, use `\noeqref{EQUATION_LABEL}` somewhere in the text or in the equation itself.

Page margins

- ▶ To manually adjust page margins, include

```
\usepackage{any size}  
\margin size{left}{right}{top}{bottom}
```

in the source header, where `left`, `right`, `top`, `bottom` are sizes given in `cm`, `mm`, `pt` or `in`.

- ▶ More info on margins [here](#). More info on L^AT_EX length units [here](#).

Saving R objects as L^AT_EX tables

- ▶ R can export objects to L^AT_EX tables using the `xtable` or `quantreg` R packages.
- ▶ The following R code

```
library(xtable) # Load xtable library
M = replicate(3, rnorm(4)) # Create random 4x3 matrix
print(xtable(M), type="latex", file="MyRTable.tex") # Print to file
```

produces a random matrix `M` and prints it as a L^AT_EX table to the file `output.tex`.

- ▶ The following R code

```
library(quantreg) # Load quantreg library
M = replicate(3, rnorm(4)) # Create random 4x3 matrix
latex.table(M, file="MyRTable") # Print to file
```

generates a similar output file.

- ▶ You can either copy the output into your L^AT_EX document, or include it automatically via the L^AT_EX command

```
\input{MyRTable.tex} % Load contents of external .tex file
```

PDF hyperlinks

- ▶ The package `hyperref` can be used to include hyperlinks (e.g. to internal sections), bookmarks and document information in the final PDF.
- ▶ For example

```
\usepackage[bookmarks, bookmarksnumbered, colorlinks=true, linkcolor=blue,  
citecolor=blue, urlcolor=green, pdfauthor={The royal me}, pdftitle={The  
Flying Spaghetti Monster}]{hyperref}
```

- ▶ More info [here](#).

Customizing lists

- ▶ You can modify the default number format of `enumerate` lists, even for different nesting-levels.
- ▶ For example, to use arabic and lowercase alphabetic numbering for the first two enumeration levels, include

```
\renewcommand{\theenumi}{\arabic{enumi}}  
\renewcommand{\labelenumi}{\theenumi.}  
\renewcommand{\theenumii}{\alph{enumii}}  
\renewcommand{\labelenumii}{\theenumi.\theenumii}
```

in the document header.

- ▶ Similar customization is possible for `itemize` lists.
- ▶ You can also set the enumeration style on the fly, as in

```
\begin{enumerate}[1.]
```

or

```
\begin{enumerate}[(i)]
```

This requires the `enumerate` package.

- ▶ More info [here](#).

Conditional content

- ▶ The `etoolbox` package lets you define boolean variables and conditional code blocks.
- ▶ You can thus create two versions of a document (such as a presentation) and easily switch between the two, by changing just a single line of code.
- ▶ For example,

```
% Place in header
\usepackage{etoolbox}
\newtoggle{biolAudience} % Define boolean variable
\toggletrue{biolAudience} % Set variable to true

% In main text
Using \iftoggle{biolAudience}{the TaqMan PCR assay}{some biology stuff}..
```

Overlays in presentations (hiding & showing parts)

- ▶ Sequential appearance of elements on a beamer slide can be achieved using *overlay specifications*.
- ▶ Overlay specifications are given within brackets <..>, and can be used in `itemize` and `enumerate` environments.
- ▶ For example,

```
\setbeamercovered{transparent} % Hidden items are still slightly visible
\begin{enumerate}
\item<1-> global warming,
\item<2-> earthquakes,
\item<3-> hurricanes.
\end{enumerate}
```

results in the following list:

1. global warming,
 2. earthquakes,
 3. hurricanes.
- ▶ More complicated overlay rules are possible, see the [beamer user guide](#).

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Cross referencing between different documents

- ▶ It is possible to cross reference between separate, self-contained documents (e.g. `Supplement` and `Article`) using `\label{..}` and `\ref{..}`.
- ▶ Simply include

```
\usepackage{xr}
\externaldocument{Article}
```

in the header of `Supplement.tex` and similar for `Article.tex` (labels must be unique across both documents).

- ▶ You have to run typesetter a couple of times on both documents.
- ▶ If you want hyperlinks within and between PDFs, use

```
\usepackage{xr-hyper}
\usepackage[.]{hyperref}
\externaldocument{Article}
```

instead, where ‘.’ refers to optional arguments. If the titles/captions of the labeled material in `Article.tex` includes macros or custom commands, the `\externaldocument{..}` command in `Supplement.tex` must be preceded by their definitions. Similar for `Article.tex`.

- ▶ More info [here](#).

Using L^AT_EX with Markdown

- ▶ **Markdown**: A lightweight markup language, often used for web-content.
- ▶ Similar logic to L^AT_EX, but much more basic.
- ▶ Can include L^AT_EX math, depending on software used to render it.
- ▶ Conversion to L^AT_EX or PDF possible with command line tool **pandoc**, e.g. using

```
pandoc myMarkdownDoc.text -o convertedLaTeXDoc.tex -t latex
```

or

```
pandoc myMarkdownDoc.text -o myNewPDF.pdf
```

For pandoc, L^AT_EX math can be inclosed within `$.$.` More info [here](#).

Tracking L^AT_EX document changes

- ▶ Since L^AT_EX sources, .bib and .bst files are just plain text, numerous revision control software can be used for collaborative L^AT_EX projects.
- ▶ Examples include [Subversion](#), or [git](#) with [GitX](#) front-end.
- ▶ Simple file comparison tools, such as [diff](#) or [FileMerge](#), might also be sufficient.
- ▶ Finally, PDF comparison tools, such as [DiffPDF](#), might be used.
- ▶ More info [here](#).

Sharing documents with people who don't know L^AT_EX

- ▶ Organize a workshop such as this one 😊.
- ▶ Have them use PDF-annotation software, such as [Preview](#) or [Adobe Acrobat](#).
- ▶ If everything fails, try converting between L^AT_EX and Word format. See the next two slides.

Converting from L^AT_EX to Word

- ▶ Quick answer: There's no easy-and-perfect solution.
- ▶ Use free conversion tool like [latex2rtf](#) or [pandoc](#), as described in this [well written manual](#) by [Laura](#).
- ▶ See [this website](#) for more methods and details.

Converting from Word to L^AT_EX

Quick answer: There's no easy-and-perfect solution. Whatever tool you use, you probably won't get around some manual corrections.

Method 1. Import document into [Open Office](#), then use [Writer2latex](#) to convert OO document to L^AT_EX. [Writer2latex](#) is already included as an [extension](#) in newer versions of OO.

Method 2. Save your Word file in the .RTF format, then use [rtf2latex2e](#) to convert that to L^AT_EX.

Method 3. Copy-paste your text from Word directly into your L^AT_EX file, then format manually. Make sure to turn off “smartquotes” and other auto-change features in Word.

See [this website](#) for more methods and details.

Further information & resources

- ▶ L^AT_EX wikibook.
- ▶ Extensive symbol list.
- ▶ The beamer user guide.
- ▶ The B to X of BibT_EX.
- ▶ UBC thesis styles (non-official).