



Overleaf for Writing L^AT_EX Documents

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T_EX & L^AT_EX

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- T_EX is a low-level markup and programming language created by Donald Knuth to typeset documents attractively and consistently.
- T_EX is a programming language in the sense that it supports the if-else construct: you can make calculations with it (that are performed while compiling the document), etc., but you would find it very hard to do anything else but typesetting with it.
- The fine control T_EX offers over document structure and formatting makes it a powerful and formidable tool.
- T_EX is renowned for being extremely stable, for running on many different kinds of computers, and for being virtually bug free.
- T_EX is a popular means by which to typeset complex mathematical formulae; it has been noted as one of the most sophisticated digital typographical systems in the world.
- Programming in T_EX generally progresses along a very gradual learning curve, requiring a significant investment of time to build custom macros for text formatting.
- Document preparation systems based on T_EX, consisting of collections of pre-built macros, exist making it easier for the user to create documents without the need to learn the T_EX language.



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- L^AT_EX is a macro package based on T_EX created by Leslie Lamport.
- Its purpose is to simplify T_EX typesetting, especially for documents containing mathematical formulae.
- Popular in academia, especially in mathematics, computer science, economics, engineering, physics, statistics, and quantitative psychology.
- Many of the academic publishing houses such as American Institute of Physics, Elsevier, etc provide templates to prepare manuscripts in L^AT_EX.
- Since L^AT_EX comprises a group of T_EX commands, L^AT_EX document processing is essentially programming.
- Using L^AT_EX to create documents is a WYSIWYM (What You See Is What You Mean) approach rather than WYSIWYG (What You See Is What You Get) approach of Microsoft Word and Libre Office.
- In L^AT_EX, you create a text file in L^AT_EX markup, which then needs to be compiled to produce the final document, most commonly is postscript (ps) or portable document format (pdf).
- The final document can be viewed uniformly on any Operating System using any version of the document viewer.



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- Document sources can be read with any text editor.
- You can concentrate purely on the structure and contents of the document, not get caught up with superficial layout issues.
- You don't need to manually adjust fonts, text sizes, line heights, or text flow for readability, as L^AT_EX takes care of them automatically.
- In L^AT_EX the document structure is visible to the user, and can be easily copied to another document.
- The layout, fonts, tables and so on are consistent throughout the document.
- Mathematical formulae can be easily typeset.
- Indexes, footnotes, citations and references are generated easily.
- Since the document source is plain text, tables, figures, equations, etc. can be generated programmatically with any language.
- You are forced to structure your documents correctly.



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- L^AT_EX is WYSIWYM and not WYSIWYG approach
i.e. you can't see what the final version will look like while typing.
- You need to know the necessary commands for the markup language.
i.e. there is no drop-down menu to create the document content such as equations, tables, inserting figures etc, you need to know how to enter those in a text editor.
- It can sometimes be difficult to obtain a certain look for the document.



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- an online collaborative writing and publishing tool that makes the whole process of writing, editing and publishing scientific documents much quicker and easier.
- provides the convenience of an easy-to-use L_AT_EX editor with real-time collaboration and the fully compiled output produced automatically in the background as you type.
- makes the journal submission process smoother for L_AT_EX users across many academic publishers.



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- cloud based product that only needs a web browser.
- effortless sharing with collaborators.
- compiles your project in the background, so you can see the output PDF right away.
- real-time commenting and integrated chat, you can discuss your work without having to switch to email, printed versions or any other tool.
- Rich Text and L_AT_EX modes if you prefer to see less of the code when you're writing
- Overleaf shows you errors and warnings as you go, so you can catch them early, and it shows them inline, so you don't have to find them in the L_AT_EX log.
- Write your thesis, create a calendar, make amazing presentations with the beamer package and create posters to showcase your work, all from a wide selection of popular templates.
- The real-time preview also helps when you're working with complicated tables, tikz figures and pgfplots graphs.



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- Overleaf Professional accounts – for students, faculty and staff.
 - ◆ Unlimited collaborators
 - ◆ Full document history
 - ◆ Reference Manager Sync
 - ◆ Dropbox and Git/Github integration
 - ◆ 20GB of storage
- Hassle-free license management – users simply register with their institutional email address on Overleaf (or add it to their existing Overleaf account) to join your Overleaf Commons license and receive their upgrade automatically.



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- Visit <https://www.overleaf.com/register>
- Sign up with your email address, Google or ORCID.
 - ◆ Your Lehigh email address and Google account is valid as long as you are a student, staff or faculty.
 - ◆ Your Overleaf account is tied to the registered email address. If your email address is deactivated, you lose access to your overleaf account.
 - ◆ Consider using your personal email or Google account for registration.
 - ◆ Go to Account Settings and add your Lehigh email as your secondary email to convert to a Pro account.



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Additional Information

- Click on New Project in the left sidebar.

- Choose from

Blank Project : Start with a empty .tex file.

Example Project : Start with an example article that overleaf provides.

Upload Project : Upload a zip file containing an existing L_AT_EX project i.e. at least one .tex file.

Import from Github : Import an existing L_AT_EX project from your Github account.



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- Start with a Blank Document and add the following lines to it

```
\documentclass[10pt]{article}

\title{My First Document}
\author{Enter your name}
\date{\today}

\begin{document}

\maketitle
\tableofcontents

\section{My First Section}\label{section1}
Hello World!

\section{My Second Section}
In Sec. \ref{section1}, we said Hello to the World.

\end{document}
```

- Watch the document compile on the right window. Click "Recompile" for compiling the document on demand.



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* Bibliography Management

* Embedded system

* Bibliographic Database

* BibTeX File

* natbib package

Additional Information

- For any academic/research writing, incorporating references into a document is an important task.
- Fortunately, LaTeX has a variety of features that make dealing with references much simpler, including built-in support for citing references.
- However, a much more powerful and flexible solution is achieved thanks to an auxiliary tool called BibTeX (which comes bundled as standard with LaTeX).
- BibTeX provides for the storage of all references in an external, flat-file database.
- This database can be referenced in any LaTeX document, and citations made to any record that is contained within the file.
- This is often more convenient than embedding them at the end of every document written; a centralized bibliography source can be linked to as many documents as desired (write once, read many!).
- bibliographies can be split over as many files as one wishes, so there can be a file containing sources concerning topic A (a.bib) and another concerning topic B (b.bib).
- When writing about topic AB, both of these files can be linked into the document (perhaps in addition to sources ab.bib specific to topic AB).



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- LaTeX provides an environment called thebibliography that you have to use where you want the bibliography; that usually means at the very end of your document, just before the `\end{document}` command.

Example

```
\begin{thebibliography}{9}
\bibitem{lampport94}
  Leslie Lampport,
  \emph{\LaTeX: A Document Preparation System}.
  Addison Wesley, Massachusetts,
  2nd Edition,
  1994.
\end{thebibliography}
```

- thebibliography is a keyword that LaTeX recognizes as everything between the begin and end tags as being data for the bibliography.
- The mandatory argument is telling LaTeX how wide the item label will be when printed.
- In the above example, reference label with only one digit i.e. upto 9 references will be printed.
- To actually cite a given document, go to the point where you want the citation to appear, and use the following: `\cite{cite_key}`, where the cite_key is that of the bibitem you wish to cite.
- To cite the above example, type `\cite{lampport94}`.



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Additional Information

- Instead of writing the bibitems at the end of each document, it would be convenient if one can create a database of such bibliographic entries which will then be available for all documents.
- BibTeX is an auxiliary program to LaTeX that automatically constructs a bibliography by searching one or more databases.
- To this end, the LaTeX file must contain the command `\bibliography{database1,database2,...}` at the point where the bibliography is to appear.
- The argument database1, database2 is the root name of the database that are to be searched and has an extension .bib.
- The reference is again made with the `\cite{key}` or `\nocite{key}` command.
- The style of the bibliography can be selected using the command `\bibliographystyle{style}` where style can one of the following values,
 - plain** : The entries in the bibliography are ordered alphabetically, each is assigned a running number in square brackets.
 - unsrt** : The entries are ordered according to their first references by the cite and nocite commands.
 - alpha** : Same as plain but the markers are an abbreviation of the author's name plus year of publication.
 - abbrv** : Same as plain but bibliography listing is shortened by abbreviating first names, months and journal names.



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- The bibliography database is a plain text file with a .bib extension,

```
@article{greenwade93,  
  author = "George D. Greenwade",  
  title = "The {C}omprehensive {T}ex {A}rchive {N}etwork ({CTAN})",  
  year = "1993",  
  journal = "TUGBoat",  
  volume = "14",  
  number = "3",  
  pages = "342--351"  
}  
@book{goossens93,  
  author = "Michel Goossens and Frank Mittelbach and Alexander Samarin",  
  title = "The LaTeX Companion",  
  year = "1993",  
  publisher = "Addison-Wesley",  
  address = "Reading, Massachusetts"  
}
```

- Common types for entries in a BibTeX file are
 - @article** : An article from a magazine or a journal.
 - @book** : A published book.
 - @proceedings** : The proceedings of a conference. Can also use conference.
 - @phdthesis** : Ph.D. thesis.
 - @manual** : Technical manual.
 - @inbook** : A section of a book without its own title.
 - @inproceedings** : An article in a conference proceedings.
 - @techreport** : Technical report from educational, commercial or standardization institution.
 - @unpublished** : An unpublished article, book, thesis, etc.



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- Using the standard LaTeX bibliography support, you will see that each reference is numbered and each citation corresponds to the numbers.
- The numeric style of citation is quite common in scientific writing.
- In other disciplines, the author-year style, e.g., (Roberts, 2003), such as Harvard is preferred.
- The **natbib** package is used to get such an output and it can supersede LaTeX's own citation commands.
- To use the natbib citation style, you need to add `\usepackage[options]{natbib}` to the document preamble.
- The options to the **natbib** package are
 - round** : Parenthesis () which is the default i.e. citation reference will be included within ()
 - square** : Square Brackets []
 - curly** : Curly Braces { }
 - angle** : Angle brackets < >
 - colon** : multiple citations are separated by semi-colons (default)
 - comma** : multiple citations are separated by commas
 - authoryear** : author year style citations (default)
 - numbers** : numeric citations
 - super** : superscripted numeric citations
 - sort** : multiple citations are sorted into the order in which they appear in the references section
 - sort&compress** : as sort, compressing multiple numeric citations where possible



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- The **natbib** package gives access to more citation commands as well as additional bibliography styles that are commonly used in scientific journals.

Natbib Commands	
Citation Command	Output
<code>\cite{goossens93}</code>	Goossens et al. (1993)
<code>\citep{goossens93}</code>	(Goossens et al., 1993)
<code>\citet*{goossens93}</code>	Goossens, Mittlebach, and Samarin (1993)
<code>\citep*{goossens93}</code>	(Goossens, Mittlebach, and Samarin, 1993)
<code>\citeauthor{goossens93}</code>	Goossens et al.
<code>\citeauthor*{goossens93}</code>	Goossens, Mittlebach, and Samarin
<code>\citeyear{goossens93}</code>	1993
<code>\citeyearpar{goossens93}</code>	(1993)
<code>\citealt{goossens93}</code>	Goossens et al. 1993
<code>\citealp{goossens93}</code>	Goossens et al., 1993
<code>\citetext{priv.\ comm.}</code>	(priv. comm.)

Natbib-compatible styles	
Style	Description
plainnat	natbib-compatible version of plain
abbrvnat	natbib-compatible version of abbrv
unsrnat	natbib-compatible version of unsrt
apsrev	natbib-compatible style for Physical Review journals
rmpaps	natbib-compatible style for Review of Modern Physics journals
IEEEtranN	natbib-compatible style for IEEE publications
achemso	natbib-compatible style for American Chemical Society journals
rsc	natbib-compatible style for Royal Society of Chemistry journals



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- Creating L_AT_EX Presentations:
<https://www.overleaf.com/learn/latex/Beamer>
 - ① Beamer: The most popular package for creating presentations.
 - ◆ Template: <https://github.com/alexpacheco/LehighBeamer>
 - ② Powerdot: <https://ctan.org/pkg/powerdot?lang=en>
 - ◆ Source code of LTS Seminar Slides:
<https://github.com/alexpacheco/latex>
- Creating L_AT_EX Posters <https://www.overleaf.com/learn/latex/Posters>
 - ① baposter
 - ◆ From a seminar I gave a few summers ago
 - ◆ My last research poster
 - ② beamerposter
 - ③ tikzposter



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<http://www.andy-roberts.net/writing/latex>.
- [3] *LaTeX*. Wikibooks.org. <http://en.wikibooks.org/wiki/LaTeX>.
- [4] E. Krishnan, editor. *L_AT_EX Tutorial: A Primer*. Indian T_EX Users Group, 2003.
<http://www.tug.org/twg/mactex/tutorials/ltxprimer-1.0.pdf>.