

How to Install \LaTeX Related Files on Windows 10 and Write First \LaTeX Document

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Hello World!

In this document, we will see how to install
L^AT_EX related files and write your first
document on L^AT_EX.

Install MikTeX and an editor. Create working directory for your first write-up.

1. Download MikTeX from the following link: <https://miktex.org/download>, and install it.
2. Download WinEdt, which is an editor (you can use any editor), from the following: <http://www.winedt.com/download.html>, and install it.
3. Create your first document in L^AT_EX:
 - (a) Create a folder, entitled **First** on your desktop (or anywhere you wish)
 - (b) Open WinEdt
 - (c) Open a new document, as follows: **File** → **New**, and save in the folder **First** as **first.tex**
 - (d) Copy-paste the code or the complete file: **first.tex** and open the file

Note. You need to download `code_for_minipage.pdf`, `code_for_wrapfigure.pdf`, `firstref.bib`, `nature.jpg`, `first.tex`, and put all the files in the folder **First**. All these files are provided in the zip folder.

Packages. I am using the following packages in the tex file (see `first.tex`):

- **fullpage** For setting all four margins to be 1 inch.
- **amsmath** For providing mathematical features.
- **graphicx** For including images in the tex file and more.
- **caption** For providing ways for writing the captions.
- **subcaption** For writing the subcaption for subfigures.
- **url**
- **hyperref** For providing cross-referencing commands and hypertext.
- **lipsum** For providing dummy text.
- **wrapfig** For writing text around a table or a figure.
- **amsthm** For providing an environment for theorems/lemmas.

Commands

Here, you can find some commands to write your first L^AT_EX document. All the given commands are for beginners. Using these commands, you can:

- Create a new page
- Create space using “medskip” or “smallskip”
- Create spacing between lines
- Set margins of a page
- Bold, italic, and underline text
- Write text in the center, left, or right side of a page
- Insert bullets
- Insert an image
- Insert a table
- Create side-by-side figures
- Create hyperlinks to each reference, figure, table, etc
- Write text around a figure
- Insert a reference using a BibTeX file
- Write an equation
- Write a theorem, its proof, and refer in the text
- Create chapters, sections, subsections, a phantom section/chapter, and refer them in the text
- Create a table of contents using `\tableofcontents`
- Create a list of figures using `\listoffigures`
- Create a list of tables using `\listoftables`

Note several other commands/symbols are given on the menu bar of WinEdt.

New page. I use here `\newpage` command to create a new page.

Medskip or Smallskip. You can create an *explicit* spacing between any two paragraphs using two commands such as `\medskip` or `\smallskip`.

Spacing between lines. You need to use `setspace` package. For creating one-half and double spacing, you use `\onehalfspacing` and `\doublespacing`, respectively, before `\begin{document}`. In this document, I used one-half spacing.

Setting margins of a page. You can use the package `fullpage` for setting all 4 margins to be 1inch, or you can explicitly set the margin using the `ansize` package and following command:

```
\marginwidth{2cm}{2cm}{1.5cm}{3cm}
```

The four values show left, right, top, and bottom margins values, respectively.

Bold, italic, and underline command. You can use the following commands:

1. **To create bold characters.** Use `\textbf{ABC}`.
2. *To create italic characters.* Use `\textit{ABC}`.
3. To create underline characters. Use `\underline{ABC}`.

Write text in the center, left, or right side of a page. Use Following commands:

1. Center text alignment: `\begin{center} TEXT \end{center}`. For example

TEXT

2. Left text alignment: `\begin{flushleft} TEXT \end{flushleft}`. For example

TEXT

3. Right text alignment: `\begin{flushright} TEXT \end{flushright}`. For example

TEXT

Insert bullets. After reading all the above-mentioned commands and their code, you know how to insert bullets.

```
\begin{itemize}
\item
\item
\end{itemize}
```

Insert an image. is illustrated using Figure 1. The command `[[h]` is used to insert the figure right after this text. By using `[t]`, you can put the figure on top side of the page. See code in the tex file to insert an image.



Figure 1: Nature Figure

1+1	2
2+2	4

Table 1: First table

Insert a table is illustrated using Table 1. See code in the tex file to insert a table.

Create side-by-side figures. You need to create “minipage” and use the command `\includegraphics` in the minipage; see Figure 2. Figure 2a is the first figure, and Figure 2b shows the code to insert two figures side-by-side. You need to include `subcaption` package to write a caption to each figure.



(a) Nature 1.

```

\begin{figure}[h]
\begin{center}
\begin{minipage}{.48\linewidth}
\centering
\includegraphics[scale=0.5]{nature.jpg}
\subcaption{Nature 1.}
\label{fig:nature1}
\end{minipage}
\begin{minipage}{.49\linewidth}
\centering
%\includegraphics[scale=0.5]{code_for_minipage.pdf}
\subcaption{code for minipage.}
\label{fig:code_for_minipage}
\end{minipage}
\end{center}
\caption{An example to show side-by-side figure.}
\label{fig:side-by-side-figures}
\end{figure}

```

(b) code for minipage.

Figure 2: An example to show side-by-side figure.

Hyperlinks. Recall that the package `hyperlink` does the task for all your figures, tables, and references.

Write text around a figure. Here, I am using `lipsum` package to write some random text using `\lipsum[1]` command. Also, `wrapfigure` command is used to write text around the figure. See Figure 3 to see the code.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

```

\begin{wrapfigure}{r}{11cm}
\begin{center}
\includegraphics{code_for_wrapfigure.pdf}
\end{center}
\caption{Wrapfigure command.}
\label{fig:Wrapfigure command}
\end{wrapfigure}
\lipsum[1]
  
```

Figure 3: Wrapfigure command.

Including a reference. Now, we are including the first reference. In the folder “First,” create a `first_ref.bib` file, which file is given on the link. You can call a reference in your tex file using `\cite{}` command. Here, you also need to include the bib file into the tex file using the following command.

```

\bibliographystyle{abbrv}
\bibliography{first_ref}
  
```

There are multiple ways to write a reference. “abbrv” is one of them. For more information, check https://www.sharelatex.com/learn/Bibtex_bibliography_styles.

Here, I included two references such as [1, 2]. In [1, 2], you can find more information about L^AT_EX.

Write a simple equation. Equations are written inside two \$ symbols, as follows: `$a+b = c$` that looks like $a + b = c$ after compilation.

1. Use `x^y` for x^y
2. Use `x_y` for x_y
3. Use `$$\bar{a}$` for \bar{a}
4. Use `$$\sqrt{a}$` for \sqrt{a}
5. Use `$$\frac{a}{b}$` for $\frac{a}{b}$
6. Use `$$\alpha$` for α
7. Use `$$\beta$` for β

8. Use `\lceil` and `\rceil` for $\lceil a \rceil$
9. Use `\rightarrow` for \rightarrow
10. Use `\leftarrow` for \leftarrow
11. Use `\geq` for \geq
12. Use `\leq` for \leq
13. Use `\neq` for \neq
14. Use `\ll` for \ll

Write a theorem and proof. You need to include `amsthm` package and define the following command before `\begin{document}` `\newtheorem{theorem}{Theorem}`. Now, use the following command to write your theorem and its proof heading. See your Theorem 1 below. More details are given here https://www.sharelatex.com/learn/Theorems_and_proofs

```
\begin{theorem}
\label{theorem:my_first_theorem}
My first theorem
\end{theorem}
\begin{proof}
Here is the proof of my first theorem
\end{proof}
```

Theorem 1. *My first theorem*

Proof. Here is the proof of my first theorem

□

Useful links.

- <https://en.wikibooks.org/wiki/LaTeX>
- https://www.sharelatex.com/learn/Learn_LaTeX_in_30_minutes

Creating a table of contents, chapters, sections, and subsections. You need to check the tex code commands to create chapters, sections, and subsection. See following pages, which will show you Chapter 1, Chapter 2, and Sections 1.1, 1.1.1, 2.1, 2.1.1.

Chapter 1

First Chapter

This is my first chapter.

1.1 First Section

This is my first section.

1.1.1 First Subsection

This is my first subsection.

First Phantom Section

This is my first **phantom** section.

Chapter 2

Second Chapter

This is my second chapter.

2.1 First Section of Second Chapter

This is my first section of Second Chapter.

2.1.1 First Subsection of Second Chapter

This is my second subsection.

My First Phantom Chapter

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List of Tables

1 First table 5

Bibliography

- [1] L. Lamport. *LaTeX: User's Guide & Reference Manual*. Addison-Wesley, 1986.
- [2] L. Lamport. *LaTeX - A Document Preparation System: User's Guide and Reference Manual, Second Edition*. Pearson / Prentice Hall, 1994.