

L^AT_EX Manual

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1 Introduction to L^AT_EX

Hello there! Welcome to the world of L^AT_EX! This manual will inform the user on how to utilize the basic functions and features of L^AT_EX.

L^AT_EX is a platform where users can prepare documents that are meant to be typed and printed. The platform is typically used for research papers and scholarly journals.

Some features about L^AT_EX that noteworthy are:

- Being able to type out mathematical formulas in a clean, organized matter, as they would appear in a math textbook
- Being able to include figures and tables in long documents.
- Being able to type out journal reports, college class take-home finals, and formal presentations.

2 Features

2.1 Document Classes

This feature is the first one that the user must put on your L^AT_EXsource code. It is highly important because the user is instructing the platform what type of document they want the document to be.

The generic format for using the document class is:

```
\documentclass[options]{class}
```

”options”

is where the user specifies the font size and the number of columns they will be using for the document .

”class”

is where the user informs the platform the kind of document they intend on making.

For example, the document class used for this specific document is:

```
\documentclass[11pt,twocolumn]{article}
```

- ”11 pt, twocolumn” is meant to indicate that the text must be in 11 point font and in two parallel columns per page
- ”article” is meant to indicate the type of document the user intends to write.[1]

2.2 Mathematical Formulas

This feature allows the user to type up mathematical formulas in a clear and concise manner, as if they would appear in math textbooks.

For Greek letters, specific mathematical operations, various mathematical symbols, exponents, and more, the user needs MODES to write out these mathematical expressions or equations.

Incline Mode

The user would want to use this mode when they would like to include their formulas within their text.

For example:

"the terms of this new sum are zero except when $m-k = m \bmod x$, when we have $a_{m-k}(x) - a_{m-k-1}(x) = 1$."

results in:

"the terms of this new sum are zero except when $m-k = m \bmod x$, when we have $a_{m-k}(x) - a_{m-k-1}(x) = 1$."

Symbols such as:

"\$ \$ " `\begin{math} \end{math}` "

can be utilized to put formulas in inline mode.

Display Mode

The user will use this mode when they would want to isolate their equations from the rest of their text.

For example:=

"Libri wrote, for example,

$$(1 - 0^{0^{-x}})(1 - 0^{0^{x-a}})$$

 for the function"

should read:

"Libri wrote, for example,

$$(1 - 0^{0^{-x}})(1 - 0^{0^{x-a}})$$

for the function"

Symbols such as:

"\$\$ \$"

"`\begin{equation} \end{equation}`"

`\begin{eqnarray*} \end{eqnarray*}`

can be utilized to put formulas in display mode.

Writing out Mathematical Expressions or Equations

If math formulas need to be written out, the user will need the \LaTeX commands in order to achieve so.

For example, the following:

```
\begin{eqnarray*}
\frac{e^{\{x\}}{0^{\{-x\}+1}}
\end{eqnarray*}
```

will result in:

$$\frac{e^x}{0^{-x} + 1}$$

As the user can tell, they need to always surround your mathematical formulas with one of the modes in order to properly display the equations. If there are no modes around the math formulas, the user's \LaTeX PDF would not compile accordingly.

NOTE: The user can only accomplish getting, in this case, fractions and exponents, and, in other cases, subscripts, summations, and integrals, once you are in a math mode. Remember, the user will not get their desired outcome if they are in not in a math mode.[2]

2.3 Graphics

For this feature, support packages with commands for the desired graphics of choice are needed.

For example, the following:

```
\usepackage{graphicx}
\graphicspath{ {images/} }
```

has to be placed right after declaring the document class and before formally beginning the document.

\LaTeX is reliant on the support package, `usepackage`, to control images.

Furthermore, the line, `graphicspath`, informs \LaTeX that there is (an) item(s) that are in the "images" folder in the directory in usage.

In order to actually access the desired image, create a folder within the same project as the main \LaTeX source code named "images." Once completed, upload an image to this folder and then pick the image of choice. Afterwards, a command is needed to directly add the image unto the document.

NOTE : Since the text editor named *shareLaTeX* was used to compile this \LaTeX manual, the instructions above may or may not be applicable to other text editor applications or platforms.

2.3.1 Putting Up, Scaling, and Rotating an Image

The most basic method of adding images is to include:

```
\includegraphics[scale=number]
{name-of-file}
```

NOTE : The "number" is only used as an example. An actual digit has to be placed in order to control the dimensions of the image. Also, the "name-of-file" is not an actual command and it only serves to illustrate that the name of the file has to be placed within the curly brackets.

For example:

```
\includegraphics[scale=0.3]{cheese}
```

will produce an image of cheese, as seen below.



Likewise: the dimensions of the image can be altered by setting parameters by width and height.

For example:

```
\includegraphics[height=parameters,
width=parameters]{cheese}
```

The "height=parameters, width=parameters" part within the brackets is meant for the user to declare what unit of measurement they wish to utilize and the number of the said unit of measurement that they need.

For example:

```
\includegraphics[height=2cm,
width=2cm]{cheese}
```

will produce an image of a height of 2 cm and a width of 2 cm below.



Rotating the image serves to exaggerate the appeal of the image. The user may do so by adding "angle" within the brackets after they declare the scale of the image. For example:

```
\includegraphics[scale=0.3,
angle=180]{cheese}
```

will produce an image that is upside-down, such as the image above.



[3]

2.4 Bibliography

Whether it is an academic journal, a research paper, or a senior thesis, it is highly desired to properly cite the sources and refer the statements within the document to its proper source.

In order to have a proper bibliography, the user must imitate the following template:

```
\begin{thebibliography}{3}
\bibitem{computers&interactivity}
Michael Garey and David S. Johnson.
\textit{Computers and
Intractability}.
Freeman, W. H. and Company, United
States, 1979.
\bibitem{communicationACM}
E. F. Codd.
```

```
\textit{Communications of the ACM.
Association for Computing Machinery,
1970.}
\end{thebibliography}
```

The "3" within the second curly brackets of the *begin* command signifies the number of entries the bibliography can contain.

The user may use the *bibitem* command to add a bibliography entry, followed by the authors of the source that the user is trying to cite.

Once completed, the user should utilize *textit* to provide the rest of the needed information for the citation.

The L^AT_EX code above should result in:

References

- [1] Michael Garey and David S. Johnson. *Computers and Intractability*. Freeman, W. H. and Company, United States, 1979.
- [2] E. F. Codd. *Communications of the ACM*. Association for Computing Machinery, 1970.

2.4.1 Citation

In order to cite the list of sources within the document, the user must write:

```
\cite{word}
```

immediately following the name of the source within the document.

NOTE : The "word" within the curly brace is not the actual item that the user should put. Instead, the user should place the same word as the put within the curly brackets with the *bibitem* command.

For example, the following:

```
The Computers publication
\cite{compninter} and the Machine
Learning journal\cite{comACM}
```

are the two sources being referenced in this document.

should appear as:

The Computers publication [1] and the Machine learning journal[2] are the two sources being referenced in this document. [4]

2.5 Footnotes

Adding footnotes to the user's research paper may give the user's audience more context about a topic or source.

For example:

```
Testing footnotes number one.
\footnote[23]{good footnotes!}
```

As the user may see, they need to add

```
\footnote[23]{good footnotes!}
```

to manually put the footnote to its corresponding sentence.

The result should look like the following:

Testing footnotes number one.²³

As the user can see from above and below, the footnote has been implemented and that the footnote is correctly placed with its corresponding sentence within the document. [5]

References

- [1] ShareLaTeX. Creating a document in latex.
- [2] ShareLaTeX. Mathematical expressions.
- [3] ShareLaTeX. Inserting images.
- [4] ShareLaTeX. Bibliography management with bibtex.
- [5] ShareLaTeX. Footnotes.

²³good footnotes!