LaTeX Typeset documents

.tex source your text → `pdflatex` → **.aux .toc .bbl** refs, contents, citations → `run again` → **PDF** final output

CONCEPTS

Source is plain text: commands start with a backslash, groups use {braces}, % starts a comment.

Cross-references and the table of contents need two runs; latexmk repeats runs for you.

Blank line starts a new paragraph; a single line break is just a space.

Reserved characters need a backslash: \# \$ \% \& _ \{ \}.

DOCUMENT STRUCTURE

`\documentclass[11pt, a4paper]{article}`
Class and options

`\usepackage{`*`<pkg>`*`}`
Load a package (preamble)

`\title{`*`<t>`*`} \author{`*`<a>`*`} \date{\today}`
Title block data

`\maketitle`
Print the title block

`\section{`*`<t>`*`}`
Numbered section

DOCUMENT STRUCTURE (cont.)

`\subsection{`*`<t>`*`}`
Subsection

`\usepackage[margin=2.5cm]{geometry}`
Set page margins

`\usepackage{hyperref}`
Clickable links; load last

TEXT

`\textbf{`*`<text>`*`}`
Bold

`\textit{`*`<text>`*`}`
Italic

`\emph{`*`<text>`*`}`
Emphasis

`\includegraphics[width=\linewidth]{`*`<img>`*`}`
Insert image (graphicx)

LISTS

`\begin{itemize} \item `*`<a>`*` \end{itemize}`
Bullet list

`\begin{enumerate} \item `*`<a>`*` \end{enumerate}`
Numbered list

MATH

`$ a^2 + b^2 $`
Inline math

MATH (cont.)

`\[ `*`<formula>`*` \]`
Display math, unnumbered

`\begin{equation} ... \end{equation}`
Numbered equation

`\begin{align} a &= b \\ &= c \end{align}`
Aligned multi-line (amsmath)

`x^{2}  x_{i}`
Superscript, subscript

`\frac{`*`<a>`*`}{`*`<b>`*`}`
Fraction

`\sum_{i=1}^{n}  \int_a^b \prod`
Sum, integral, product

`\alpha \beta \pi \Delta`
Greek letters

`\usepackage{amsmath}`
Needed for align and friends

TABLES

`\begin{tabular}{lcr}`
Columns: left, centre, right

`a & b & c \\`
Cells split by &, row ends \\

`\usepackage{booktabs}`
Professional rules

`\begin{table}[htbp] ... \end{table}`
Floating table with caption

FIGURES AND REFERENCES

`\begin{figure}[htbp] ... \end{figure}`
Floating figure

`\caption{`*`<text>`*`}`
Caption inside float

`\label{`*`<key>`*`}`
Name a place (after \caption)

`\ref{`*`<key>`*`}`
Number of labelled item

`\centering`
Centre inside a float

BIBLIOGRAPHY

`\cite{`*`<key>`*`}`
Cite an entry

`\bibliography{`*`<file>`*`}`
BibTeX database (no .bib)

`\usepackage[backend=biber]{biblatex}`
Modern bibliography

`\addbibresource{`*`<file>`*`.bib}`
biblatex database

`\printbibliography`
biblatex output spot

BUILD

`latexmk -pdf `*`<file>`*`.tex`
Build, rerun as needed

`latexmk -pdf -pvc `*`<file>`*`.tex`
Rebuild when files change

`pdflatex `*`<file>`*`.tex`
Single pass to PDF

`xelatex `*`<file>`*`.tex`
Unicode and system fonts

RECIPES

Minimal article

```
\documentclass{article}
\usepackage[margin=2.5cm]
{geometry}
\begin{document}
Hello, $E = mc^2$.
\end{document}
```

Figure with caption and ref

```
\begin{figure}[htbp]
  \centering
  \includegraphics[width=.
8\linewidth]{plot.pdf}
  \caption{Results}
  \label{fig:res}
\end{figure}
See Figure~\ref{fig:res}.
```

Cited article, biblatex

```
\usepackage[backend=biber]
{biblatex}
\addbibresource{refs.bib}
...
As shown by
\textcite{knuth84}.
\printbibliography
```