

```

\documentstyle[12pt]{article} % [11pt] or [12pt] are optional:
% the default (\documentstyle{article}) is 10pt

\setlength{\parskip}{1.2ex} % space between paragraphs
\setlength{\parindent}{2em} % amount of indentation
\setlength{\textwidth}{6.25in}
\setlength{\oddsidemargin}{0.5in} % + 1" = margin from left edge
\setlength{\textheight}{8in}
\setlength{\topmargin}{-0.5in} % + 1.5" = margin from top

% --- define your own commands!! ---

\newcommand{\viii}{\indent \indent \indent} % triple-depth indent

\title{A Sample \LaTeX\ Document}
\author{Schl\oe ffonffl\ae g\en, L\ae rs}
\date{November 14, 1992}

\begin{document}
\maketitle % as defined above.

```

This document is intended to serve as a mini reference manual for $\LaTeX$. It is produced by the $\LaTeX$ software, generated from the source text shown at left. For this and the next three pages, compare the source text (left side) with $\LaTeX$ ' typeset product (right side), to see how special macros (which always involve the escape character $\backslash$) produce the desired effects.

$\backslash$ section{Ordinary Text} % Produces section heading. Lower-level sections % are begun with similar \subsection and % \subsubsection commands; numbering is automatic!

$\backslash$ subsection{Spacing in the source text}

The ends of words and sentences are marked by spaces. It doesn't matter how many spaces

you type; one is as good as 100.

The end of a line counts as a space.

One or more blank lines denote the end of a paragraph.

Since any number of consecutive spaces are treated like a single one, the formatting of the input file makes no difference to $\TeX$, but it makes a difference to you. When you use $\LaTeX$, making your input file as easy to read as possible will be a great help as you write your document and when you change it. Keep typed lines ($\backslash$ bf short) in length, and use $\backslash$ verb9 % comments9. % like this!

Because printing is different from typewriting, there are a number of things that you have to do differently when preparing an input file than if you were just typing the document directly. Quotation marks like "this" have to be handled specially.

$\backslash$ subsection{Special characters}

Dashes come in three sizes: an

intra-word

dash, a medium dash for number ranges like

1--2,

and a punctuation

dash---like this.

$\TeX$ interprets some common characters as commands, so you must type special commands to generate them. These characters include the following: $\backslash$ \$ $\backslash$ & $\backslash$ % $\backslash$ # $\backslash$ { and $\backslash$ }.

(document)

(mydoc.tex, page 1)

A Sample $\LaTeX$ Document

Schlœffonfflægën, Lärs

November 14, 1992

This document is intended to serve as a mini reference manual for $\LaTeX$. It is produced by the $\LaTeX$ software, generated from the source text shown at left. For this and the next three pages, compare the source text (left side) with $\LaTeX$ ' typeset product (right side), to see how special macros (which always involve the escape character $\backslash$) produce the desired effects.

1 Ordinary Text

1.1 Spacing in the source text

The ends of words and sentences are marked by spaces. It doesn't matter how many spaces you type; one is as good as 100. The end of a line counts as a space.

One or more blank lines denote the end of a paragraph.

Since any number of consecutive spaces are treated like a single one, the formatting of the input file makes no difference to $\TeX$, but it makes a difference to you. When you use $\LaTeX$, making your input file as easy to read as possible will be a great help as you write your document and when you change it. Keep typed lines **short** in length, and use % comments.

Because printing is different from typewriting, there are a number of things that you have to do differently when preparing an input file than if you were just typing the document directly. Quotation marks like "this" have to be handled specially.

1.2 Special characters

Dashes come in three sizes: an intra-word dash, a medium dash for number ranges like 1-2, and a punctuation dash—like this.

$\TeX$ interprets some common characters as commands, so you must type special commands to generate them. These characters include the following: $\backslash$ & $\backslash$ % $\backslash$ # $\backslash$ { and $\backslash$ }.

1.3 Fonts

In printing, text is emphasized by using an *italic* type style. A long segment of text can also be emphasized in this way. Text within such a segment given additional emphasis with Roman type.

Other font types are available:
Bold face type,
 typewriter style type, also used as `verbatim`,
 sans-serif type,
 slanted type,
 ALL CAPS TYPE.

Formulae and other mathematical expressions are given their own “math mode” font. Many special mathematical and miscellaneous symbols are available in math mode;

$$\| \diamond \star \| \quad \clubsuit \diamond \heartsuit \spadesuit \quad \# \S \quad \cap \cup \pm \mp \quad \prod \alpha \beta \gamma \quad \oint_C f(z) dz \quad \Gamma_{\sqrt{r}}^{u,v} \quad V \oplus W$$

2 Spacing

A sentence-ending space should be larger than the space between words within a sentence. You sometimes have to type special commands in conjunction with punctuation characters to get this right, as in the following sentence. Gnats, gnus, etc. all begin with G. Generating an ellipsis ... with the right spacing around the periods requires a special command.

It is sometimes necessary to prevent TeX from breaking a line where it might otherwise do so. This may be at a space, as between the “Mr.” and “Jones” in “Mr. Jones”, or within a word—especially when the word is a symbol like *itemnum* that makes little sense when hyphenated across lines.

In math mode, TeX ignores the spaces you type and formats the formula the way it thinks is best. Though TeX often knows best, you sometimes have to adjust spacing manually to make a formula look just right. One reason is that TeX may not understand the formula’s logical structure, interpreting (for example) $y \, dx$ as the product of three quantities rather than as y times the differential dx , so that it doesn’t add the little extra space after the y . You can use these special spacing commands:

`\,` thin space (any mode)
`\:` medium space (math mode only)
`\;` thick space (math mode only)
`\!` thin backspace (math mode only)

A most precise spacing command can be used in either math or paragraph modes; the `\kern` command. Use it with the unit “em”, which is the width of a capital M. Example: to print ‘R’ over an ‘l’ you might use the command `\kern-0.27emR` to produce “R”.

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\subsection{Fonts}
In printing, text is emphasized by using an {\em italic\}
type style.      % The \ command produces the tiny extra space that
                  % should be added between a slanted and a following
                  % unslanted letter.

\begin{em}
  A long segment of text can also be emphasized in this way.
  Text within such a segment given additional emphasis
  with\/ {\em Roman} type.
\end{em}

\end{em}

Other font types are available:
\indent {\bf Bold face type,} \
\indent {\tt typewriter style type,} also used as \verb@verbatim@, \
\indent {\sf sans-serif type,} \
\indent {\sl slanted type,} \
\indent {\sc all caps type,} \
Formulae and other mathematical expressions are given
their own ‘math mode’ font. Many special mathematical and
miscellaneous symbols are available in math mode:
$$ \Vert \Diamond \star \Vert \quad \clubsuit \diamond \heartsuit \spadesuit \quad \# \S \quad \cap \cup \pm \mp \quad \prod \alpha \beta \gamma \quad \oint_C f(z) dz \quad \Gamma_{\sqrt{r}}^{u,v} \quad V \oplus W
```

```
\section{Spacing}
A sentence-ending space should be larger than the space between
words within a sentence. You sometimes have to type special
commands in conjunction with punctuation characters to get this
right, as in the following sentence.
  Gnats, gnus, etc.\
all begin with G@. % @ marks end-of-sentence punctuation.
Generating an ellipsis
\ldots\
% ‘\,’ needed because TeX ignores spaces after
% command names like \ldots made from \ + letters.
with the right spacing around the periods requires a special command.
```

It is sometimes necessary to prevent TeX from breaking a line where it might otherwise do so. This may be at a space, as between the “Mr.” and “Jones” in “Mr. Jones”, or within a word—especially when the word is a symbol like `\itemnum` that makes little sense when hyphenated across lines.

In math mode, TeX ignores the spaces you type and formats the formula the way it thinks is best. Though TeX often knows best, you sometimes have to adjust spacing manually to make a formula look just right. One reason is that TeX may not understand the formula’s logical structure, interpreting (for example) `\bf y:dx` as the product of three quantities rather than as y times the differential dx , so that it doesn’t add the little extra space after the y . You can use these special spacing commands:

```
\ii \verb2\,2---thin space---(any mode) \
\ii \verb9\!9---medium space---(math mode only) \
\ii \verb\#\!#---thick space---(math mode only) \
\ii \verb2\!2---thin backspace---(math mode only) \
A most precise spacing command can be used in either math or paragraph modes; the \verb2\kern2 command. Use it with the unit ‘em’, which is the width of a capital M. Example:
to print ‘R’ over an ‘l’ you might use the command
\verb@l\kern-0.27emR@ to produce ‘l\kern-0.27emR’.
```



```


$$\frac{\partial u}{\partial t} + \nabla^4 u + \nabla^2 u + \frac{1}{2} |\nabla u|^2 = c^2$$


$$a^n + b^n \neq c^n \quad \text{for } n > 2 \quad (\text{see proof in margin})$$


$$\lim_{k \rightarrow \infty} x_k \geq \pi \quad \forall x \in \mathcal{F} \quad \exists \delta \quad \text{such that} \quad |y - x| < \delta \Rightarrow y \in \mathcal{F}$$


$$\Psi' = \frac{d}{d\phi} \begin{pmatrix} \phi_2 \\ \phi_3 \\ 1 - \phi_2 - \phi_1^2/2 \end{pmatrix} \quad \Theta = \begin{pmatrix} 0 & 1 & 0 \\ -\theta_1 \psi_1 - \psi_2 & 0 & \psi_3 \\ -\phi_1 & -1 & 0 \end{pmatrix}$$


$$\begin{aligned} \int_0^\infty e^{-x^2} dx &= e^{-(\int_0^\infty x dx)^2} && (\text{incorrect}) \\ &= e^{-\infty} && (\text{incorrect}) \\ &= 0.38 - 1.7i && (\text{incorrect}) \end{aligned}$$


$$\sum_{k=1}^n \frac{1}{k} \approx \ln k + \gamma = (\ln 10)(\log_{10} k) + \gamma \approx 2.3026 \log_{10} k + 0.57772$$


| $k$ | $x_1^k$     | $x_2^k$    | $x_3^k$     |
|-----|-------------|------------|-------------|
| 0   | -0.30000000 | 0.60000000 | 0.70000000  |
| 1   | 0.47102965  | 0.04883157 | -0.53345964 |
| 2   | 0.49988691  | 0.00228830 | -0.52246185 |
| 4   | 0.50000000  | 0.00000307 | -0.52359743 |
|     | :           | :          | :           |
| 9   | 0.50000000  | 0.00000000 | -0.52359877 |


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References

- [1] Lamport, Leslie. $\LaTeX$: A Document Preparation System. Copyright ©1986, Addison-Wesley Publ.Co.,Inc.
- [2] Schleefonfflægen, Lärs. Silly Typography. *Journal of Linguistics* 19D (1977), 23-37.