LaTeX cheat sheet

May 1, 2009

All the LaTeX commands you know and love... now gathered into one convenient reference!

For more information, see `http://tug.ctan.org/tex-archive/info/lshort/english/lshort.pdf`.

1 General

- All LaTeX commands start with a backslash. Command arguments go in {curly braces}.

- LaTeX ignores anything from a precent sign (%) to the end of the line (comments).

- Paragraphs are separated by a blank line.

- Use two backticks to make an opening quotation mark and two apostrophes to make a closing one: ``quotation marks''.

- `\section{Foo}` starts a new section titled "Foo," and likewise for `\subsection` and so on.

- You can give any numbered or lettered thing (section, equation, list item, etc.) a label with `\label{foo}` and then later refer to it using `\ref{foo}` to automatically insert the correct number. For example:

  ```
  \begin{equation}
    \label{eq:pythagorean}

    a^2 + b^2 = c^2
  \end{equation}

  As shown in equation \ref{eq:pythagorean}...
  ```

- You can define your own commands in the preamble (the part of the file before the `\begin{document}`) with `\newcommand{\com}{blah}`. From now on, everywhere you write `\com` it will be replaced with `\blah`.

2 Environments

- Creating a LaTeX document:

```
\documentclass{article}

% setup goes here

\begin{document}

  % content goes here

\end{document}
```

- Make a bulleted list with `\begin{itemize}` ... `\end{itemize}`, and a numbered list with `\begin{enumerate}` ... `\end{enumerate}`. Each list item starts with `\item`.

- In general, the "environment" `foo` starts with `\begin{foo}` and ends with `\end{foo}`.

- Make a table with the `tabular` environment. For example:

```
\begin{tabular}{cc|c}
  $A$ & $B$ & $A \land B$  \\
  \hline
  $T$ & $T$ & $T$ \\
  $T$ & $F$ & $F$ \\
  $F$ & $T$ & $T$ \\
  $F$ & $F$ & monkey
\end{tabular}
```

3   Mathematics

- Mathematics in the middle of text should be surrounded by dollar signs. For example:

  ```
  Since we know that $x^2 - 5 \leq f(z)$, we can
  substitute for $f$ to obtain...
  ```

- Make an equation by itself on a separate line with an `equation` environment. If you don't want a number next to the equation, use `equation*` instead, or use `\[ ... \]`. You don't need to use dollar signs inside an `equation` environment; it is in "math mode" automatically.

- Make superscripts with `^` (carat) and subscripts with `_` (underscore). If your superscript or subscript is more than one character, be sure to enclose it in curly brackets. For example, `2^i` (2^i), `x_{99}` (x_{99}).

- You can make a multi-line equation (for example, to show the steps in solving an equation) using an `align*` environment. Put the alignment character `&` before the place in the equations that you want aligned, and put `\\` at the end of each line except the last. For example:

  ```
  \begin{align*}
    x &= y + 4 \\
    z &= 2 + \sqrt{x} \\
      &= 2 + 1 + \sqrt{x} - 1
  \end{align*}
  ```

- You can make matrices with a `pmatrix` environment (use `vmatrix` for determinants). For example, you can typeset the following matrix:

$$\begin{pmatrix} 4 & 5 & x+2 \\ 9 & 0 & \pi \\ 6+5i & \sqrt{3} & -2 \end{pmatrix}$$

  with this code:

```
\[
  \begin{pmatrix}
    4 & 5 & x + 2 \\
    9 & 0 & \pi \\
    6 + 5i & \sqrt{3} & -2
  \end{pmatrix}
\]
```

- You can create sigma notation using the `\sum` command, followed by a subscript and a superscript for the parts below and above the Σ. For example, `\sum_{k=1}^{20} (k^2 + 3)` produces

$$\sum_{k=1}^{20} (k^2 + 3).$$

- You can write modular equivalences with `\equiv` and `\pmod`. For example, the equation

$$12 \equiv 17 \pmod{5}$$

can be typeset with `12 \equiv 17 \pmod{5}`.

4   Symbols

4.1   General mathematical symbols

All of the commands listed below are standard LaTeX commands except those marked with an asterisk*, which are defined in `precalc.sty`.

Symbol	command
LaTeX	\LaTeX
$\leq$	\leq
$\geq$	\geq
$\sqrt{x}$	\sqrt{x}
$\sqrt[5]{x}$	\sqrt[5]{x}
...	\dots

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Symbol	command
{	\{
|	\mid, \suchthat*
}	\}
∈	\in
∉	\not \in
∅	\emptyset
ℕ	\N*
ℤ	\Z*
ℚ	\Q*
ℝ	\R*
𝕀	\I*
ℂ	\C*
∪	\cup, \union*
∩	\cap, \intersect*
\	\setminus
$\overline{S}$	\overline{S}
∞	\infty
⊆	\subseteq
⊂	\subset
×	\times
→	\to
↦	\mapsto
∘	\circ
∧	\land
∨	\lor
¬	\neg
⟹	\implies
⟺	\iff
∀	\forall
∃	\exists
⊕	\oplus

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Symbol	command
sin	\sin
cos	\cos
cis	\cis*
tan	\tan
csc	\csc
sec	\sec
cot	\cot
$50°$	50^\circ
arcsin	\arcsin
arccos	\arccos
arctan	\arctan
det	\det

4.2   Greek alphabet

Name	Lowercase	Uppercase
\alpha	α	—
\beta	β	—
\gamma	γ	Γ
\delta	δ	Δ
\epsilon	ϵ	—
\zeta	ζ	—
\eta	η	—
\theta	θ	Θ
\iota	ι	—
\kappa	κ	—
\lambda	λ	Λ
\mu	μ	—
\nu	ν	—
\xi	ξ	Ξ
\pi	π	Π
\rho	ρ	—
\sigma	σ	Σ
\tau	τ	—
\upsilon	υ	Υ
\phi	ϕ	Φ
\chi	χ	—
\psi	ψ	Ψ
\omega	ω	Ω