Introduction to LaTeX

Brian Schiller

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- `\command[optional]{argument}`

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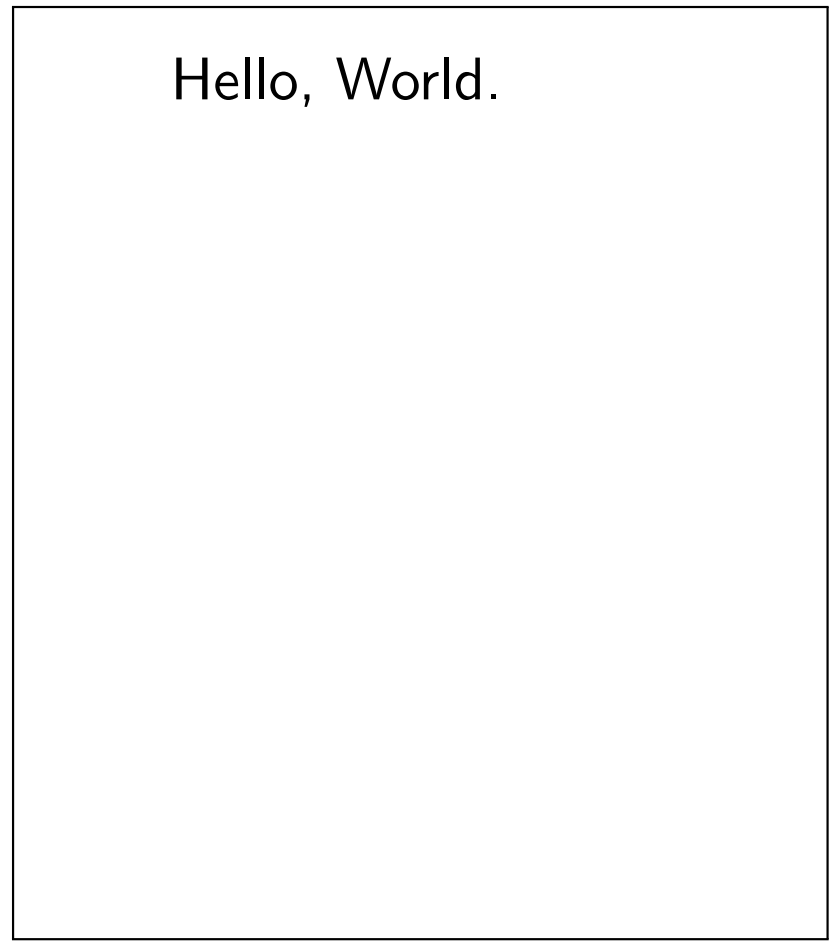

The Preamble

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\documentclass[11pt]{article}

%begins paragraphs with an empty line instead of a tab.
\usepackage[parfill]{parskip}

%creates smaller margins
\usepackage[margins=1in]{geometry}

%math commands and symbols
\usepackage{amsmath, amssymb}

% Theorem and proof environments
\usepackage{amsthm}

%allows for comment blocks and verbatim sections
\usepackage{verbatim}

%change font to KP serif \usepackage[T1]{fontenc}
\usepackage{kpfonts}

\title{A Rudimentary Introduction to \LaTeX}
\author{Brian Schiller} \date{\today}

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That code contains an error; who know where?

Math Mode

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- Spacing in math mode squeezes everything together. Use `\hspace{...}`.
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- Some symbols are treated differently:

Input	Text Mode	Math Mode
2<5	2¡5	$2 < 5$
5>2	5¿2	$5 > 2$
3|6	3—6	$3 \mid 6$

Typing Math

Inline math is for a situation when you want an expression like $x^2 + y^2 \leq 4$ right in the middle of your paragraph. It is typed `\(x^2+y^2 \leq 4\)`, or alternatively, `$x^2+y^2 \leq 4$`.

Display math is presented separate from your text, like so:

$$x^2 + y^2 \leq 4$$

It is typed `\[x^2+y^2 \leq 4\]`.

You can force Display-sized math in an inline environment by prefixing the expression with `\displaystyle`:
`\( \displaystyle x^2+y^2 \leq 4\)`

Superscripts and Subscripts

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Note that brackets can be left off if the superscript or subscript is only one character. `x_1 + 3x_2 =4` would be the same as above

Fractions

Fractions are typed:
`\frac{top}{bottom}`

$$\frac{top}{bottom}$$

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The Align Environment

Ampersands, & mark the alignment point,

Two backslashes separate each line, \\.

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x&=2a+3a\\
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Note: The Align environment enters math mode automatically.

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It is often useful to align two columns at once:

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\begin{aligned}
x &= x \wedge (y \vee z) && \text{(by distributivity)} \\
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input	matrix	bmatrix	pmatrix	vmatrix	Vmatrix

`\[`
`\begin{...}`
`1&2 \\`
`3&4`
`\end{...}`
`\]`
	$\begin{matrix} 1 & 2 \\ 3 & 4 \end{matrix}$	$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$	$\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$	$\begin{vmatrix} 1 & 2 \\ 3 & 4 \end{vmatrix}$	$\begin{Vmatrix} 1 & 2 \\ 3 & 4 \end{Vmatrix}$

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In preamble:
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For proofs:

```
\begin{proof}[optional title]
First, consider the number of primes: at least five...
\end{proof}
```

Tables

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\begin{tabular}{c | c | c | c}
   Var & \multicolumn{3}{c}{Functions}\\
   $x$ & $2x$ & $x^2$ & $2x^2$ \\
   \hline
   -1&-2&1&2\\
   0&0&0&0\\
   1 & 2 & 1 & 2\\
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Also available: `verbatim` and `algorithmic`.

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