₽TEX

Chris Sims

Why LATE

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Mathematics

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Making LATE

Help!

LATEX Create Snazzy Documents

Chris Sims

24 Sep 2013

Outline

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Starte

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Code Listings

Making LATEX Your Own

Help

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- 2 Getting Started
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What Is It?

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Why LATEX?

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Help!

- pronounced either lay-tech or lah-tech
- a set of macros on top of TEX, a markup and programming language originally created by Donald Knuth
- a language designed to let the writer focus on content, while taking care of layout

Uh...Why Can't I Just Type What I Want?

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Help!

- consistent and professional typography
- fully customizable and extendable
- no special file formats
- vast amount of packages available for almost any application

Installation

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Various incarnations of the TeXLive package are available:

- typically available in Linux package managers
- MacTex package for OSX
- MikTeX for Windows

Editor support is widely available:

- vim vim-latex-suite
- emacs auctex
- sublime text LATEXTools
- a large number of dedicated editors for LATEX

Basics

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A simple "Hello World" example:

\documentclass{article}

```
\begin{document}
Hello world!
\end{document}
```

Finite Automata

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Graphics

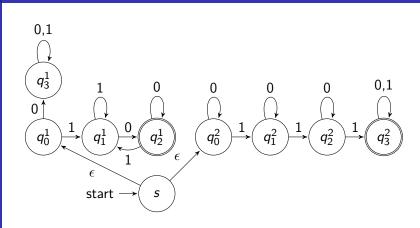
Mashamatia

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Packages

The tikz package and automata and arrows tikz libraries are required for this.

Images

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Packages

The graphicx package is required to import images.

Math Environments

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There are two main methods of inserting mathematical statements into your text:

- inline: \$<maths>\$
- the math environment: \[maths \]

There are a handful of specialized math environments which can come in handy:

- align and align* align each line on arbitrary characters
 (e.g. the equals sign)
- proof a bit of extra formatting typically seen in proofs

Not Your Average Environment

Many things are different in the math environments, so make sure to read through the Mathematics and Advanced Mathematics sections in the WikiBook

Basic Tables

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Your Own

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		Degree	γ	Cost	Cross-Validated Error (%)
1 L	inear			0.01	20.8
2 L	inear			0.1	22.1
3 P	Polynomial	2		0.01	40.0
4 P	Polynomial	2		0.1	34.8
5 P	Polynomial	2		1	19.4
6 P	Polynomial	2		10	18.1
7 P	Polynomial	2		100	19.3
8 P	Polynomial	3		1	18.7
9 R	Radial		0.125	1	18.3
10 R	Radial		0.125	10	19.0
11 R	Radial		0.1	1	18.0
12 R	Radial		0.05	1	19.0
_13 F	Radial (tuned)		0.0625	8	16.8

Table: Results from model search

Basic Tables, ctd

```
MTFX
             \begin {table}[h]
               \centering
               \begin{tabular}{l l c r r c}
                 ID & Kernel & Degree & $\gamma$ & Cost &
           5
                 Cross-Validated Error (\%) \\
                 \ hline
                    & Linear
                                                   & 0.01 & 20.8 \\
                                                   & 0.1
                    & Linear
                                      Dr.
                                                          & 22.1 \\
                    & Polynomial
                                        2 &
                                                   & 0.01 & 40.0 \\
          10
Tables
                                                   & 0.1
                    & Polynomial
                                        2 &
                                                          & 34.8 \\
                    & Polynomial
                                        2 &
                                                   & 1
                                                          & 19.4 \\
                    & Polynomial
                                                   & 10
                                                          & 18.1 \\
                    & Polvnomial
                                        2 &
                                                   & 100
                                                          & 19.3 \\
                 8
                    & Polynomial
                                      & 3 &
                                                   & 1
                                                          & 18.7 \\
          15
                                                          & 18.3 \\
                    & Radial
                                          & 0.125
                 10
                    & Radial
                                        & 0.125
                                                   & 10 & 19.0 \\
                 11 & Radial
                                          & 0.1
                                                   & 1
                                                          & 18.0 \\
                 12 & Radial
                                          & 0.05
                                                   & 1
                                                          & 19.0 \\
                  13 & Radial (tuned) &
                                          & 0.0625 & 8
                                                           & 16.8 \\
                 \ hline
               \end{tabular}
               \caption{Results from model search}
             \end{table}
```

Code Listings

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Code Listings

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Code listings are used to display source code in a document.

- lstlisting listing environment
- many options available to customize and designate language

Package Required

The listings package is required to use code listings.

Macros

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There are a handful of commands to abstract some common routines

- newcommand takes a name, num of arguments, and a definition
- newenvironment takes a name, num of arguments, and begin and end blocks
- basic programming constructs like conditionals and loops are also available to use

Getting Help

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Help!

LATEX is crazy complicated - where do you even start?

- LATEX WikiBook: not exhaustive, but a great source
- TEX.stackexchange.com: like StackOverflow, but for TEX
- packages have documentation on CTAN (Comprehensive TEX Archive Network)
- examples are a great place to find snippets (like this document!)
- ask me!