BEAUTIFUL DOCUMENTS IN LATEX

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Data Science Society at Berkeley

Outline

LOGISTICS

Logistics

- Slides: *https : //github.com/jerrylin96/DSS_DeCal_Public*
- Attendance mandatory - only meet once a week with lots of material. Today's link: https://tinyurl.com/TeXLa
- Cheating

WHY LATEX

- Excellent tool to format documents that include lots of math and statistics

$$e^{-at}\sin(\Omega t)u(t) \Leftrightarrow \frac{\Omega}{(s+a)^2+\Omega^2}$$

$$y = \frac{n!}{k!(n-k)!}p^k q^{n-k} = \binom{n}{k} p^k q^{n-k}$$

- Documents have high-quality typesetting
- Files can be structured by title, author, heading, etc.
- Not good for design

EDITORS FOR LaTeX

Editors for LaTeX

Downloadable editors

- `http://www.xm1math.net/texmaker`
- `http://texstudio.sourceforge.net`

Online, collaborative editors

- Instant compilation
- `http://www.sharelatex.com`
- `http://www.overleaf.com`

Overleaf

Free Pro account for UC Berkeley students:

- `https://www.overleaf.com/edu/berkeley`
- 10GB storage with .edu email
- Berkeley templates and more

CREATING A BASIC DOCUMENT

Creating a Basic Document

Common Syntax

- Commands are preceded with "\" and arguments are contained within "{}"
- New lines are started with a return or "\\" at the end of each line
- Comments are preceded by "%"
- More syntax:
  `https://en.wikibooks.org/wiki/LaTeX/Mathematics`

Three Part to Blank Document

- \documentclass{DocType}
- \usepackage[utf8]{inputenc}
  - character encoding that can be as compact as ASCII
  - UTF - Unicode Transformation Format
  - ’8’ means it uses 8-bit blocks to represent a character
  - inputenc specifying to the engine how to process the symbols you’re typing
- \begin{document}
- \end{document}

DEMO

COMMON DATA SCIENCE SYNTAX

Math Mode

- Mathematical formulas contained between "$math$"
- Subtext: Text_{Subtext}
- Theta: \theta(x)
- Fraction: \frac{ numerator}{ denominator}
- Exponent: Y^{x}
- Softmax Regression:

$$h_\theta(x) = \frac{1}{1+\exp(-\theta^\top x)}$$

- Cost Function:

$$J(\theta) = -\left[\sum_{i=1}^{m} y^{(i)} \log h_\theta(x^{(i)}) + (1 - y^{(i)}) \log(1 - h_\theta(x^{(i)}))\right]$$

DEMO

WHAT CAN YOU CREATE WITH LaTeX?

What Can You Create with LaTeX?

- Homework Documents - Your TA's will love you!
- Resumes - Look super professional
- Presentations - Like this one!
- Posters - 10/10 layouts

HOMEWORK

Homework

David Xiao - A Beginner's Guide to LaTeX

- https://www.cs.princeton.edu/courses/archive/spr10/cos433/Latex/latex-guide.pdf

Create a Resume in LaTeX

- Starter Templates: https://www.overleaf.com/gallery/tagged/cv
- Need help? Google is your best friend!
  Email: *aleskova@berkeley.edu*
  Office Hours: Check Piazza!