Introduction to and Basics of LaTeX
Sponsored by Qualcomm

Alex Ray[1]

[1]College of Textiles
North Carolina State University

NC State Linux User Group, 2009

Introduction
○○○○
○○○○○○
○○
○○○

Our Results/Contribution
○○○○
○○○○
○○○
○○

The Language and Syntax
○○
○○○○

Mathematics
○○
○○○○○

Floats
○○○○○○

Questions?

Summary

Outline

1. **Introduction**
   - A Quick "Hello World"
   - What is LATEX, anyway?
   - fooooooo
   - Previous Work

2. **Our Results/Contribution**
   - Main Results
   - Basic Ideas for Proofs/Implementation
   - How to use LATEX
   - Extending LATEX

3. **The Language and Syntax**
   - Syntax
   - Formatting

4. Mathematics

Introduction　Our Results/Contribution　The Language and Syntax　Mathematics　Floats　Questions?　Summary
●○○○　○○○○　○○　○○　○○○○○○
○○○○○○　○○○○　○○○○　○○○○○
○○　○○○○
○○○　○○

A Quick "Hello World"

Outline

Introduction Our Results/Contribution The Language and Syntax Mathematics Floats Questions? Summary
○●○○   ○○○○   ○○   ○○   ○○○○○○
○○○○○○   ○○○○   ○○○○   ○○○○○
○○   ○○○○
○○○   ○○

A Quick "Hello World"

Code

```latex
\documentclass{article}
\title{Cartesian closed categories %
    and the price of eggs}
\author{Jane Doe}
\date{September 1994}
\begin{document}
    \maketitle
    Hello world!
\end{document}
```

Introduction
○○●○
○○○○○○
○○
○○○

Our Results/Contribution
○○○○
○○○○
○○

The Language and Syntax
○○
○○○○

Mathematics
○○
○○○○○

Floats
○○○○○○

Questions?

Summary

A Quick "Hello World"

In English this time

- This document is an article.
- Its title is "Cartesian closed categories and the price of eggs".
- Its author is Jane Doe.
- It was written in September 1994.
- The document consists of a title followed by the text "Hello world!"

Introduction   Our Results/Contribution   The Language and Syntax   Mathematics   Floats   Questions?   Summary

A Quick "Hello World"

Results

Cartesian closed categories and the price of eggs

Jane Doe

September 1994

Hello world!

Introduction   Our Results/Contribution   The Language and Syntax   Mathematics   Floats   Questions?   Summary
○○○○   ○○○○   ○○   ○○   ○○○○○○
●○○○○○   ○○○○   ○○○○   ○○○○○
○○   ○○○○
○○○   ○○

What is LaTeX, anyway?

Outline

What is LaTeX, anyway?

TeX
...before LaTeX

- Typesetting system created by Donald Knuth
- Anybody could produce high-quality typography (in theory)
- Made to typeset complex mathematical formulae
- Popular in academic settings
- Difficulty and effort required gave rise to simplifications...

What is LATEX, anyway?

... enter LATEX

"Lah-tech" or "Lay-tech" as in Greek $\tau\epsilon\chi$

- Package of macros based on TEX
- Created by Leslie Lamport
- Simplifies TEXtypesetting, especially for mathematical formulae
- Many additional packages and styles contributed by the community
- Archived in the Comprehensive TeX Archive Network (CTAN)[1]

---

[1]http://www.ctan.org/

Introduction	Our Results/Contribution	The Language and Syntax	Mathematics	Floats	Questions?	Summary
0000	0000	00	00	000000		
000●00	0000	0000	00000			
00	0000					
000	00					

What is LATEX, anyway?

The many facets of LATEX

- LATEX refers to multiple things
- NOT a Word-Processor (e.g. Microsoft Word)
- WYSIWYM instead of WYSIWYG
  - What-You-See-Is-What-You-Mean (semantics), versus
  - What-You-See-Is-What-You-Get (visual syntax)
- Document Preparation System
  - Made for high-quality typesetting
  - Commonly used for technical/scientific documents
- Document Markup Language
  - Similar to HTML. (IMHO - could be better)

Introduction	Our Results/Contribution	The Language and Syntax	Mathematics	Floats	Questions?	Summary
0000	0000	00	00	000000		
0000●0	0000	0000	00000			
00	0000					
000	00					

What is LaTeX, anyway?

Disadvantages

- Lack of a 'Live Preview', must be compiled to view results. (This is general to all WYSIWYM systems.)
- Must learn the markup language and command syntax.
  - Programmers feel right at home, but others may find this a difficulty in using LaTeX
  - Users only need to learn as much syntax as they want to use
  - General to all markup languages
- Difficult to manually adjust the typesetting
  - This is frustrating to those familiar with WYSISYG editors
  - This is actually considered an advantage by users familiar with LaTeX

Introduction   Our Results/Contribution   The Language and Syntax   Mathematics   Floats   Questions?   Summary
○○○○   ○○○○   ○○   ○○   ○○○○○○
○○○○○○●   ○○○○   ○○○○   ○○
○○   ○○○○   ○○○○○
○○○   ○○

What is LᴬTᴇX, anyway?

Advantages

- Forces authors to focus on the content (what you want to say) instead of the layout (how it looks on the page)
    - This often trips up new users, who think of this as a requirement for document creation
- The visual layout is consistent throughout a document
- Separation of content and style (like CSS on web pages) enables users to work on each seperately
- Mathematical Formulae (LaTeX is the standard)
- Indexes, ToC's, Footnotes, References and Bibliographies are easily and cleanly generated
    - Compare to WYSIWYG editors
    - Requires authors to correctly structure their documents
    - Benefits the reader as well

Introduction   Our Results/Contribution   The Language and Syntax   Mathematics   Floats   Questions?   Summary
○○○○   ○○○○   ○○   ○○   ○○○○○○
○○○○○○   ○○○○   ○○○○   ○○○○○
●○   ○○○○
○○○   ○○

fooooooo

Outline

Make Titles Informative.

You can create overlays. . .

- using the `pause` command:
  - First item.
  - Second item.
- using overlay specifications:
  - First item.
  - Second item.
- using the general `uncover` command:
  - First item.
  - Second item.

Introduction Our Results/Contribution The Language and Syntax Mathematics Floats Questions? Summary
○○○○   ○○○○   ○○   ○○   ○○○○○○
○○○○○○   ○○○○   ○○○○   ○○○○○
○●   ○○○○
○○○   ○○

foooooooo

Make Titles Informative.

You can create overlays. . .

- using the `pause` command:
  - First item.
  - Second item.
- using overlay specifications:
  - First item.
  - Second item.
- using the general `uncover` command:
  - First item.
  - Second item.

Introduction Our Results/Contribution The Language and Syntax Mathematics Floats Questions? Summary
○○○○   ○○○○   ○○   ○○   ○○○○○○
○○○○○○   ○○○○   ○○○○   ○○
○●   ○○○○
○○○   ○○

foooooooo

Make Titles Informative.

You can create overlays. . .

- using the `pause` command:
    - First item.
    - Second item.
- using overlay specifications:
    - First item.
    - Second item.
- using the general `uncover` command:
    - First item.
    - Second item.

Introduction | Our Results/Contribution | The Language and Syntax | Mathematics | Floats | Questions? | Summary
○○○○ | ○○○○ | ○○ | ○○ | ○○○○○○
○○○○○○ | ○○○○ | ○○○○ | ○○○○○
○● | ○○
○○○

foooooo

Make Titles Informative.

You can create overlays. . .

- using the `pause` command:
  - First item.
  - Second item.
- using overlay specifications:
  - First item.
  - Second item.
- using the general `uncover` command:
  - First item.
  - Second item.

Introduction Our Results/Contribution The Language and Syntax Mathematics Floats Questions? Summary
○○○○ ○○○○ ○○ ○○ ○○○○○○
○○○○○○ ○○○○ ○○○○ ○○
○● ○○○○ ○○○○○
○○○ ○○

fooooooo

Make Titles Informative.

You can create overlays. . .

- using the `pause` command:
    - First item.
    - Second item.
- using overlay specifications:
    - First item.
    - Second item.
- using the general `uncover` command:
    - First item.
    - Second item.

Introduction   Our Results/Contribution   The Language and Syntax   Mathematics   Floats   Questions?   Summary
oooo   oooo   oo   oo   oooooo
oooooo   oooo   oooo   oooooo
oo●   oooo   oo
ooo   oo   ooooo

fooooooo

Make Titles Informative.

You can create overlays. . .

- using the `pause` command:
  - First item.
  - Second item.
- using overlay specifications:
  - First item.
  - Second item.
- using the general `uncover` command:
  - First item.
  - Second item.

Introduction   Our Results/Contribution   The Language and Syntax   Mathematics   Floats   Questions?   Summary

○○○○   ○○○○   ○○   ○○   ○○○○○○
○○○○○○   ○○○○   ○○○○   ○○○○○
○○   ○○○○
●○○   ○○

Previous Work

Outline

Alex Ray   North Carolina State University

Introduction	Our Results/Contribution	The Language and Syntax	Mathematics	Floats	Questions?	Summary
○○○○	○○○○	○○	○○	○○○○○○		
○○○○○○	○○○○	○○○○	○○○○○			
○○	○○○○					
○●○	○○					

Previous Work

Make Titles Informative.

Introduction Our Results/Contribution The Language and Syntax Mathematics Floats Questions? Summary
○○○○ ○○○○ ○○ ○○ ○○○○○○
○○○○○ ○○○○ ○○○○ ○○○○○
○○ ○○○○
○○● ○○

Previous Work

Make Titles Informative.

Introduction
○○○○
○○○○○○
○○○
Our Results/Contribution
●○○○
○○○○
○○○○
○○

The Language and Syntax
○○
○○○○

Mathematics
○○
○○○○○

Floats
○○○○○○

Questions?

Summary

Main Results

Outline

Introduction   Our Results/Contribution   The Language and Syntax   Mathematics   Floats   Questions?   Summary

Main Results

Make Titles Informative.

Introduction	Our Results/Contribution	The Language and Syntax	Mathematics	Floats	Questions?	Summary
○○○○	○○●○	○○	○○	○○○○○○		
○○○○○○	○○○○	○○○○	○○○○○			
○○	○○○○					
○○○	○○					

Main Results

Make Titles Informative.

Introduction
○○○○
○○○○○○
○○
○○○

Our Results/Contribution
○○○●
○○○○
○○○○
○○

The Language and Syntax
○○
○○○○

Mathematics
○○
○○○○○

Floats
○○○○○○

Questions?

Summary

Main Results

Make Titles Informative.

Introduction   Our Results/Contribution   The Language and Syntax   Mathematics   Floats   Questions?   Summary
0000   0000   00   00   000000
000000   ●000   0000   00000
00   0000
000   00

Basic Ideas for Proofs/Implementation

Outline

Introduction
○○○○
○○○○○○
○○
○○○

Our Results/Contribution
○○○○
○●○○
○○○○
○○

The Language and Syntax
○○
○○○○

Mathematics
○○
○○○○○

Floats
○○○○○○

Questions?

Summary

Basic Ideas for Proofs/Implementation

Make Titles Informative.

Introduction
○○○○
○○○○○○
○○○

Our Results/Contribution
○○○○
○○●○
○○○○
○○

The Language and Syntax
○○
○○○○

Mathematics
○○
○○○○○

Floats
○○○○○○

Questions?

Summary

Basic Ideas for Proofs/Implementation

Make Titles Informative.

Introduction
○○○○
○○○○○○
○○

Our Results/Contribution
○○○○
○○○●
○○○○
○○

The Language and Syntax
○○
○○○○

Mathematics
○○
○○○○○

Floats
○○○○○○

Questions?

Summary

Basic Ideas for Proofs/Implementation

Make Titles Informative.

Introduction   Our Results/Contribution   The Language and Syntax   Mathematics   Floats   Questions?   Summary
○○○○   ○○○○   ○○   ○○   ○○○○○○
○○○○○○   ○○○○   ○○○○   ○○
○○   ●○○○   ○○○○○
○○○   ○○

How to use LATEX

Outline

Introduction
○○○○
○○○○○○
○○
○○○

Our Results/Contribution
○○○○
○○○○
○●○○
○○

The Language and Syntax
○○
○○○○

Mathematics
○○
○○○○○

Floats
○○○○○○

Questions?

Summary

How to use LaTeX

LaTeX, the Document Creation System

Introduction | Our Results/Contribution | The Language and Syntax | Mathematics | Floats | Questions? | Summary
○○○○ | ○○○○ | ○○ | ○○ | ○○○○○○
○○○○○○ | ○○○○ | ○○○○ | ○○
○○ | ○●○● | | ○○○○○
○○○ | ○○ |

How to use LaTeX
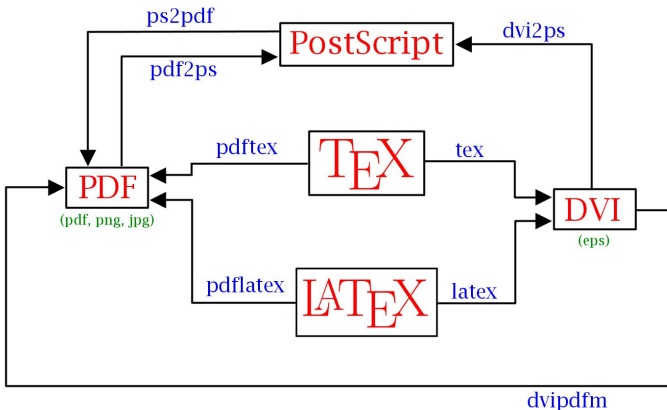
Simple Usage

- The simplest usage case is using a general (raw) text editor:
  - Examples: NotePad, Emacs, Vim, Notepad++, Wordpad
- Documents are compiled via the command line
  - Programs to compile .tex source: `tex`, `latex`, `pdftex`, `pdflatex`
  - Programs to convert documents between types: `dvi2ps`, `ps2pdf`, `pdf2ps`
- Familiar approach to those that work in these (text) editors often
- Foreign approach to those used to WYSIWYG editors (everyone else)

How to use LATEX

Integrated Development Environments

- Mac OS X
  - TEXshop – *http://www.uoregon.edu/ koch/texshop/*
- Windows
  - LEd (LATEX Editor) – *http://www.latexeditor.org*
  - TEXnicCenter – *http://www.texniccenter.org*
- Linux
  - Kile – *http://kile.sourceforge.net/*
- Multiplatform
  - TEXmaker – *http://www.xm1math.net/texmaker/*
  - LyX – WYSIWYM – *http://www.lyx.org/*

Introduction
0000
000000
00
000

Our Results/Contribution
0000
0000
0000
●0

The Language and Syntax
00
0000

Mathematics
00
00000

Floats
000000

Questions?

Summary

Extending LATEX

Outline

Packages

- Packages are sets of macros, commands, document classes, etc. that extend LaTeXfunctionality past the base language.
- Examples include `Beamer`-used to create this presentation, and `AMSMath`-the ubiquitous Mathematics package.
- Huge number of packages available-all user contributed (karnaugh maps, finite state automata, analog circuit diagrams, ...)
- Usenet was the old go-to for LaTeXpackages, but has since become outdated.
- Use CTAN, the Comprehensive TEXArchive Network. *http://www.ctan.org/*

Introduction
○○○○
○○○○○○
○○
○○○

Our Results/Contribution
○○○○
○○○○
○○○○
○○

The Language and Syntax
●○
○○○○

Mathematics
○○
○○○○○

Floats
○○○○○○

Questions?

Summary

Syntax

Outline

Introduction   Our Results/Contribution   **The Language and Syntax**   Mathematics   Floats   Questions?   Summary

○○○○   ○○○○   ○●   ○○   ○○○○○○
○○○○○○   ○○○○   ○○○○   ○○○○○
○○   ○○
○○○   ○○

Syntax

LaTeX, the Language

- Comments begin with '%' and go to the end of the line
- Extend all the way through the next line's whitespace
- Commands begin with '\'
    - Optional Parameters go after command in []'s
    - Required Parameters go after command in {}'s
    - E.g. `\cmdname[opt1,opt2,...]{arg1}{arg2}...`
- Extra whitespace is ignored
- Environments are marked with `\begin{}` and `\end{}`
- Control Characters need to be escaped:
    `\# \$ \% \^ \{ \} \& \_ \{ \} \~ \textbackslash`

Introduction
○○○○
○○○○○○
○○
○○○

Our Results/Contribution
○○○○
○○○○
○○○○
○○

The Language and Syntax
○○
●○○○

Mathematics
○○
○○○○○

Floats
○○○○○○

Questions?

Summary

Formatting

Outline

Introduction	Our Results/Contribution	The Language and Syntax	Mathematics	Floats	Questions?	Summary
0000	0000	00	00	000000		
000000	0000	0●00	00000			
00	00					
000	00					

Formatting

Text Formatting

- Sizes:

  ```
  \tiny, \scriptsize, \footnotesize,
          \small, \normalsize, \large, \Large, \LA
  ```

- *Emphasis:* \emph{...} *Also:* {\em ...}
- Quotes: LaTeXdifferentiates between ' and '.
    - `Single 'quote'`: Single 'quote'
    - `Double ''quote`: Double "quote
- Sub- and Superscript: \textsubscript{...} and
  ^{...}
- **Boldface** {\bf ...}, *Italics* {\it ...}, SMALL CAPS
  {\sc ..}

Formatting

Paragraph Formatting

- Alignment:
  - Left Justified: `\begin{flushleft}` and `\raggedleft`
  - Right Justified: `\begin(flushright)` and `\raggedright`
  - Centered: `\begin{center}` and `\centering`
- Line Spacing:
  - Entire Document: Use `\linespread{...}` in the preamble. `\linespread{1.3}` will yield $1\frac{1}{2}$ line spacing, while `\linespread{1.6}` will yield double.
  - Section of Text: Include `\usepackage{setspace}` in the preamble, which provides the `singlespace`, `onehalfspace`, `doublespace` and `spacing` environments.
    - `\begin{doublespace}` or `\begin{spacing}{1.6}`

Introduction	Our Results/Contribution	The Language and Syntax	Mathematics	Floats	Questions?	Summary
○○○○	○○○○	○○	○○	○○○○○○		
○○○○○○	○○○○	○○○●	○○○○○			
○○	○○○○					
○○○	○○					

Formatting

Verbatim and Lists

- Verbatim: Outputs exactly what is typed
  - \begin{verbatim}...\end{verbatim}
- Itemize:
  - \begin{itemize}...\end{itemize}
- Enumerate:
  1. \begin{enumerate}...\end{enumerate}
- Description:

  Environment Syntax: \begin{description}
  Item Syntax: \item[Description]
- Each item is designated by the \item command.
- Different list types can be nested.

Introduction
0000
000000
00
000

Our Results/Contribution
0000
0000
0000
00

The Language and Syntax
00
0000

Mathematics
●0
00000

Floats
000000

Questions?

Summary

Environments

Outline

Introduction	Our Results/Contribution	The Language and Syntax	Mathematics	Floats	Questions?	Summary
○○○○	○○○○	○○	○●	○○○○○○		
○○○○○○	○○○○	○○○○	○○○○○			
○○	○○○○					
○○○	○○					

Environments

Math Environments

- LaTeX uses two different environments for mathematical formulae:
  - *text* – Formulae are displayed in-line, within the body of text. Good for small equations.
    - \begin{math} ... \end{math}
    - (e.g.) ... thus arriving at $a^2 + b^2 = c^2$, which is the Pythagorean Theorem.
  - *displayed* – Formulae are displayed seperated from the text. Good for large equations.
    - \begin{equation} ... \end{equation}
    - (e.g.) ... which yields Stoke's Theorem:

$$\int_{\Sigma} \nabla \times \mathbf{F} \cdot d\Sigma = \oint_{\partial \Sigma} \mathbf{F} \cdot d\mathbf{r} \tag{1}$$

- Always include the amsmath package by using the command \usepackage{amsmath}.

Introduction
0000
000000
00
000

Our Results/Contribution
0000
0000
0000
00

The Language and Syntax
00
0000

Mathematics
00
●0000

Floats
000000

Questions?

Summary

Examples

Outline

1. **Introduction**
   - A Quick "Hello World"
   - What is LATEX, anyway?
   - fooooooo
   - Previous Work

2. **Our Results/Contribution**
   - Main Results
   - Basic Ideas for Proofs/Implementation
   - How to use LATEX
   - Extending LATEX

3. **The Language and Syntax**
   - Syntax
   - Formatting

4. **Mathematics**

Examples

Math by Example

$$\nabla \times \mathbf{B} = \mu_0 \mathbf{J} + \mu_0 \epsilon_0 \frac{\partial \mathbf{E}}{\partial t}$$

LaTeX Code:

```
\begin{equation*}
    \nabla \times \mathbf{B} = \mu_
\mu_0\epsilon_0\frac{\partial\mathbf{E}}{\partial t
\end{equation*}
```

Introduction	Our Results/Contribution	The Language and Syntax	**Mathematics**	Floats	Questions?	Summary
○○○○	○○○○	○○	○○	○○○○○○		
○○○○○○	○○○○	○○○○	○○●○○			
○○	○○○○					
○○○	○○					

Examples

Math by Example

$$\mathbf{a} \times \mathbf{b} = ab\sin\theta \; \mathbf{\hat{n}} = \det \begin{bmatrix} \mathbf{i} & \mathbf{j} & \mathbf{k} \\ a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \end{bmatrix} \qquad \text{(CPR)}$$

LaTeX Code:

```
    \begin{equation} \mathbf{a} \times \mathbf{b}
= ab\sin\theta \; \mathbf{\hat{n}} = \mathrm{det}
 \begin{bmatrix} \mathbf{i} & \mathbf{j} & \mathbf{
\\ a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \end{bmatrix}
\label{CPRelations} \tag{CPR} \end{equation}
```

By labeling the equation with `\label{}`, I can reference (CPR)

Math by Example

$$\cos^2 \theta = \Big(\frac{e^{i\theta} + e^{-i\theta}}{2}\Big)^2$$
$$= \frac{e^{i2\theta} + 2e^{i0} + e^{-i2\theta}}{4}$$
$$= \frac{1 + \cos 2\theta}{2} \tag{1}$$

LaTeX Code:

```
\setcounter{equation}{0}
\begin{align} \cos^2 \theta
&= \Big(\frac{e^{i\theta} + e^{-i\theta}}{2}\Big)^2
&= \frac{e^{i2\theta} + 2e^{i0} + e^{-i2\theta}}{4}
&= \frac{1 + \cos 2\theta}{2} \end{align}
```

Introduction	Our Results/Contribution	The Language and Syntax	**Mathematics**	Floats	Questions?	Summary
0000	0000	00	00	000000		
000000	0000	0000	00000●			
00	0000					
000	00					

Examples

Math by Example

$$\iiint_G \overbrace{f(r, \phi, \theta)}^{\text{Spherical Function}} \mathrm{d}r\mathrm{d}\phi\mathrm{d}\theta = \int_0^{2\pi} \int_0^{2\pi} \int_{-4}^4 \underbrace{\sqrt{\frac{r^{\pi\frac{\varphi}{z}}}{\sqrt{r^2 + z^2}(e^{i\varphi} + e^{-i\varphi})}}}_{\text{Ugly Cylindrical Function}} \, \mathrm{d}$$

LaTeX Code:

```
\[ \iiint_{G} \overbrace{f(r,\phi,\theta)}^\text{Spher
\,\mathrm{d}r\mathrm{d}\phi\mathrm{d}\theta =
\int_0^{2\pi} \!\int_0^{2\pi} \!\int_{-4}^4
\underbrace{\sqrt{ \frac{r^{\pi\frac{\varphi}{z}}}
{\sqrt{r^2 + z^2}(e^{i\varphi} +  e^{-i\varphi})}}}
_\text{Ugly Cylindrical Function}
\;\mathrm{d}r \mathrm{d}\varphi \mathrm{d}z \]
```

Introduction   Our Results/Contribution   The Language and Syntax   Mathematics   **Floats**   Questions?   Summary
○○○○   ○○○○   ○○   ○○   ●○○○○○
○○○○○○   ○○○○   ○○○○   ○○
○○   ○○○○   ○○○○○
○○○   ○○

Figures, Tables, and Labels

Outline

Introduction
○○○○
○○○○○○
○○
○○○

Our Results/Contribution
○○○○
○○○○
○○○○
○○

The Language and Syntax
○○
○○○○

Mathematics
○○
○○○○○

Floats
○●○○○○

Questions?

Summary

Figures, Tables, and Labels

Figures

- When compiling with *latex*, only Encapsulated Postscript (EPS) files can be imported.
- Compiling with *pdflatex* allows JPG, PDF, and PNG formats to be imported.
- By using the `draft` option in the `\documentclass[...]{...}` command in the preamble, image output can be suppressed and every image will be replaced by the name of that image.
- Remember to include the command `\usepackage{graphicx}`.
- Use floats! (`\begin{figure}` and `\begin{table}`)

Introduction Our Results/Contribution The Language and Syntax Mathematics **Floats** Questions? Summary
○○○○   ○○○○   ○○   ○○   ○○●○○○
○○○○○○   ○○○○   ○○○○   ○○○○○
○○   ○○○○
○○○   ○○

Figures, Tables, and Labels

Figures by Example

LATEX Code:

```
\begin{figure}
\begin{center}
\includegraphics[width=0.3\textwidth]{lena.
\end{center}
```

Introduction	Our Results/Contribution	The Language and Syntax	Mathematics	**Floats**	Questions?	Summary
○○○○	○○○○	○○	○○	○○○●○○		
○○○○○○	○○○○	○○○○	○○○○○			
○○	○○○○					
○○○	○○					

Figures, Tables, and Labels

Figures by Example

Figure: A Liquid Crystal

LaTeX Code:

```
\begin{figure}[h] %t, b, p, !, and H (with \usepackage{float})
    \begin{center} \vspace{-5pt}
        \reflectbox{\includegraphics[scale=0.1, angle = -15]{lena.
        \label{CNematic}
        \caption{A Liquid Crystal} \vspace{-10pt}
    \end{center}
\end{figure}
```

Introduction   Our Results/Contribution   The Language and Syntax   Mathematics   **Floats**   Questions?   Summary
0000   0000   00   00   000000
000000   0000   0000   00000
00   0000
000   00

Figures, Tables, and Labels

Tables by Example

Component	Target (%)	Target (g)	Actual (g)	Actual(%)
RMS03-010C	98.2 %	.5024 g	.5032 g	98.4 %

Table: A Table of Measurements

LaTeX Code:

```
\begin{table}
    \begin{tabular}[c]{|l || c | c | c | c |}
        \hline
            Component & Target (\%) & Target (g) & Actual
        \hline
            RMS03-010C & 98.2 \% & .5024 g & .5032 g & 98.
        \hline
    \end{tabular}
```

Figures, Tables, and Labels

Referencing Labels

- As seen before, an object can be labeled by using the \label{...} command.
- This object can be referenced using this label with the command \ref{...}. This will print the number assigned to the object.
- Similarly, \pageref{...} will print the page number of the referenced object.
- Be sure to use \label{...} *after* \caption{...}. Otherwise, the reference will be attached to the current section or list number.
- Lists of Tables and Lists of Figures can be created by using \listoftables or \listoffigures. This will create a numerically ordered list of floats, complete with captions.

Any Questions?

This presentation will be posted online for reference.
LaTeX is much too large a topic to cover in one sitting, but hopefully this is a good start.
Other References:

- Wikipedia article on LaTeX
- LaTeX Project Site
- Wikibook on LaTeX

Summary

- The first main message of your talk in one or two lines.
- The second main message of your talk in one or two lines.
- Perhaps a third message, but not more than that.

- Outlook
    - Something you haven't solved.
    - Something else you haven't solved.

For Further Reading I

📕 A. Author.
Handbook of Everything.
Some Press, 1990.

📄 S. Someone.
On this and that.
Journal of This and That, 2(1):50–100, 2000.