LaTeX
Andreas Klappenecker
Johannes Gutenberg

Introduced movable metal type to Europe

Invented the printing press

Started a revolution in printing in Europe
Gutenberg demonstrated his printing technology by printing a complete bible.

The Gutenberg bible was produced at a significantly lower cost than hand copying.

Still, cost: about 3 years salary of a clerk per bible.

1978: Copy sold for $2.2 million
Texte du texte
Fast Forward to 1974

Academic books often a mix of handwritten symbols (e.g. formulas) and typeset symbols.

Note the arrows...
Fast Forward to 2011
(Homework Submission)

The scan is a faithful reproduction of the submission! It remains a mystery how the TA was able to read it.
Late 70’s: Don Knuth invents TeX

2 Features

Both \TeX{} and \LaTeX{} allow for accents, and excel at typesetting mathematical equations, in-line or displayed on a line by itself. For instance, an article on quadratics may need

\[ ax^2 + bx + c = 0 \iff x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}, \]

or an article on complex analysis may include \( e^{i\theta} = \cos \theta + i \sin \theta \).
Knuth

- Don Knuth illustrates the mathematical typesetting with TeX by writing the bible of computer programming:
- Four volumes published so far:
1984: LaTeX

In 1984, Leslie Lamport writes the markup language LaTeX that makes TeX particularly easy to use.

Key feature: The document is organized according to its structure (e.g. Title, Chapter, Sections, etc.)

The language is easy to learn

Available on virtually all computing platforms
Computer programmers will feel right at home: The document is produced by a program.

The language can be customized with macros.

Typesetting of formulas is easy: Once you understand the main features, most formulas are quickly written in LaTeX.

Much faster than any formula editor.
Structure of a LaTeX Document

\documentclass{article}
% macro definitions
\begin{document}
% text comes here
\end{document}

Comments begin with %

Commands start with \
LaTeX Example

LaTeX is a document preparation system for the \TeX\ typesetting program. It offers programmable desktop publishing features and extensive facilities for automating most aspects of typesetting and desktop publishing, including numbering and cross-referencing, tables and figures, page layout, bibliographies, and much more. \LaTeX{} was originally written in 1984 by Leslie Lamport and has become the dominant method for using \TeX{}; few people write in plain \TeX{} anymore. The current version is \LaTeXe. % This is a comment; it will not be shown in the final output.

The following shows a little of the typesetting power of \LaTeX: % The following shows a little of the typesetting power of LaTeX:

\begin{align}
E &= mc^2 \\
E &= \frac{mc^2}{\sqrt{1-\frac{v^2}{c^2}}} \\

\end{align}

\end{document}
Emphasizing Text

This is a \textbf{bold} text \\
This is a \textit{text} in italics \\
This is a \textsl{slanted} text

This is a \textbf{bold} text \\
This is a \textit{text} in italics \\
This is a \textsl{slanted} text
Inline Mathematics

You can write a text and within the text you can have inline mathematical formulas, such as $\sqrt{x^2+1}$, that are simply enclosed in single dollar signs.

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Displayed Mathematics

Important equations can be set in double dollar signs, $$ y = \sqrt{x^2 + 1}, $$ and will be displayed as a centered equation.

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$$ y = \sqrt{x^2 + 1}, $$

and will be displayed as a centered equation.
Numbering Equations

A numbered equation
\begin{equation}\label{eqn}
z^2 = x^2 + y^2.
\end{equation}
It follows from equation (\ref{eqn}) that ...

A numbered equation

\begin{equation}
z^2 = x^2 + y^2. \tag{1}
\end{equation}

It follows from equation (1) that ...

Run LaTeX twice to resolve references
Compiling LaTeX Documents

Suppose you have written a LaTeX document, say homework.tex

Compiling the document, typesetting, and creating a pdf file:
pdflatex homework.tex

View your document homework.pdf with some pdf viewer (e.g., ghostview homework.pdf, preview homework.pdf, ...)
LaTeX Distributions

- Windows: MikTeX
- Mac: MacTeX
- Unix: Tex Live
- Further information: http://www.ctan.org/
- Already installed on unix.cs.tamu.edu
Homework

- Our problem sets will be assigned using a LaTeX file, say hw1.tex
- The file will typically contain 10 problems
- You add the solutions, your name, and all the resources that you have used.
- Submit your homework solution to csnet: hw1.tex and hw1.pdf (BOTH!!)
- Submit a hardcopy version of your hw1.pdf in class (no need to print out hw1.tex).