LaTeX and TeX

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Outline

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A Brief History of TEX

- First there was just Gutenberg, and everything was fine.

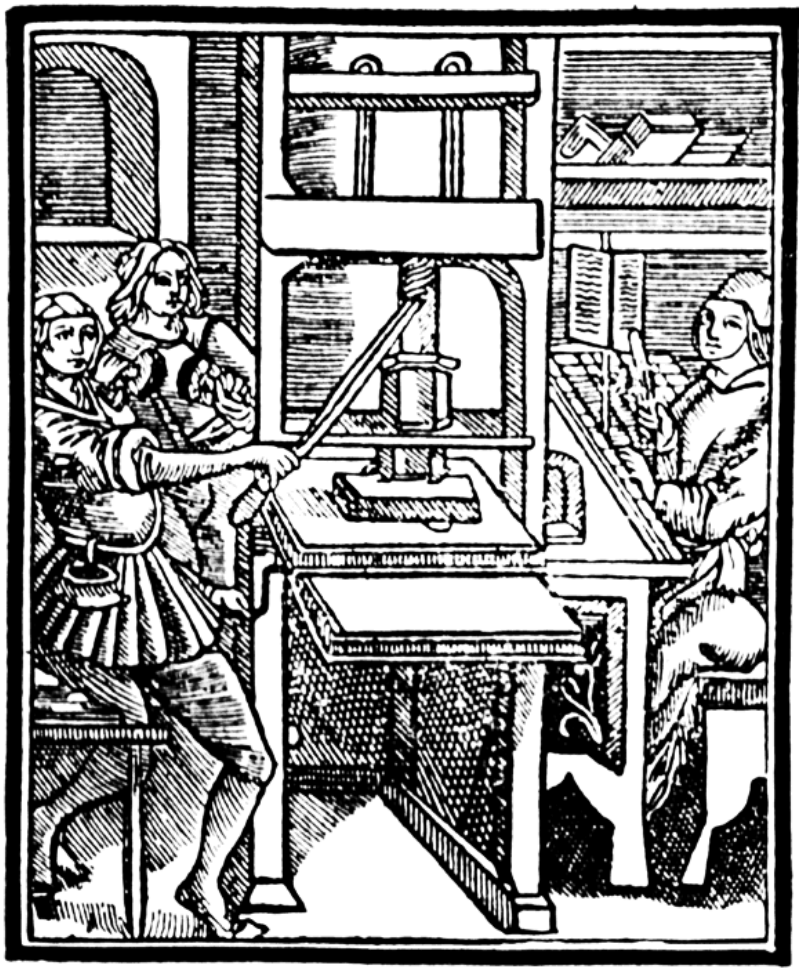

Figure: From `etc.usf.edu`

A Brief History of TEX

- First there was just Gutenberg, and everything was fine.
- Then there was computers and bad typesettings.

Figure: From `www.stormerbrooks.com`

A Brief History of TEX

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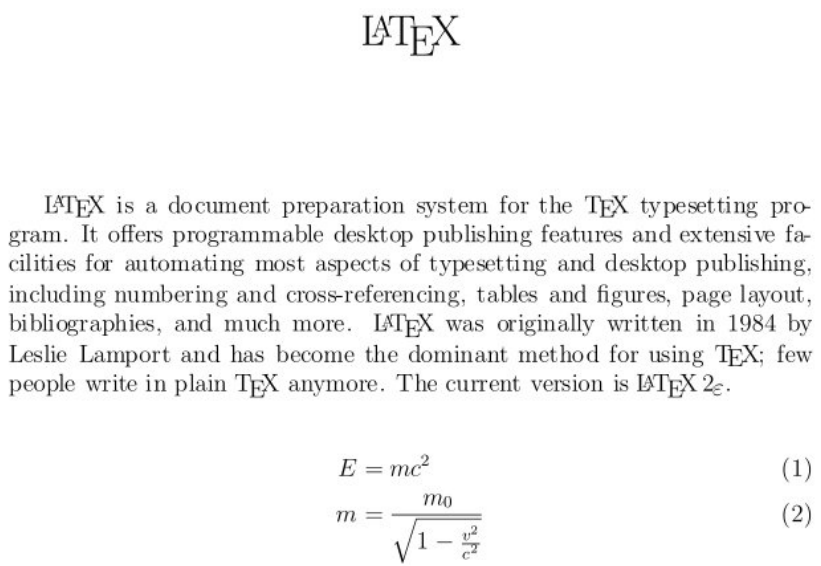
- Then here comes the God.

Figure: From `www.xoolive.org`

A Brief History of TEX

- First there was just Gutenberg, and everything was fine.
- Then there was computers and bad typesettings.
- Then here comes the God.
- Then we have beautiful books.



LATEX

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 LATEX 2_ε.

$$E = mc^2 \quad (1)$$

$$m = \frac{m_0}{\sqrt{1 - \frac{v^2}{c^2}}} \quad (2)$$

Figure: From `jonfucius.wordpress.com`

Features of TEX

- Attractive math and texts

AMS Euler

$$\int_0^3 9x^2 + 2x + 4\,dx = 3x^3 + x^2 + 4x + C\Big]_0^3 = 102$$

$$e^{x+iy} = e^x(\cos y + i\sin y)$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Figure: From `wikipedia`

Features of TEX

- Attractive math and texts
- Consistent output

In our research group, we write proposals collaboratively on four platforms, all outputs are guaranteed to be the same.

Features of TEX

- Attractive math and texts
- Consistent output
- Turing-completness and powerful macro systems

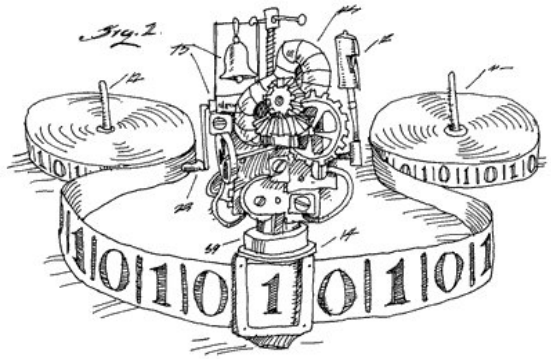


Figure: From `www.ecs.syr.edu`

TEX Trivia

- The name

TEX is $\tau\epsilon\chi$. Pronounce the χ as a Greek chi, not an x.

A master of TEX is a TEXnician, not a TEXpert. 

TeX Trivia

- The name
- The implementation

Literate Programming

TeX is of superior quality–432 modifications since first release [1]

TeX Trivia

- The name
- The implementation
- Version π

The absolution final change.
All bugs will become features.

Motivation

- Plain TEX is too ... plain ...

Motivation

- Plain TEX is too ... plain ...
- Typographical vs. logical markups

Let us say you want to write

1. Introduction

You should use **section**{**Introduction**} instead of **bf** {**1. Introduction** }

Motivation

- Plain TeX is too ... plain ...
- Typographical vs. logical markups
- LaTeX, a higher level macro package for TeX

LaTeX, Then and Now

- Started as a macro system

LaTeX, Then and Now

- Started as a macro system
- Now a system with 1000+ packages

LaTeX, Then and Now

- Started as a macro system
- Now a system with 1000+ packages
- The most popular document preparation system in academia

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WYSIWYG and WYSIWYM

- Similar to HTML, you can not see the final result while editing.

Instead of click **B** button and see the result, you have to write {\bf text} and recompile the whole document (unless you use LyX)

WYSIWYG and WYSIWYM

- Similar to HTML, you can not see the final result while editing.
- You can however have multiple outputs on a single output

Changing the layout and style is as easy as changing just one markup

WYSIWYG and WYSIWYM

- Similar to HTML, you can not see the final result while editing.
- You can however have multiple outputs on a single output
- You have extension powers

We will see more examples later

LaTeX Files as Programs

- LaTeX files as source codes, TeX and LaTeX as compilers

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You can use Makefile and svn to manage your files

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- Both compilers and results are platform independent

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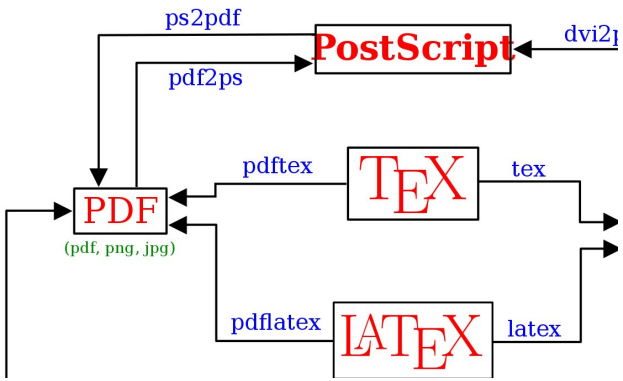

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LaTeX2html, *re*Structured *Text*

Existing LaTeX Distributions

- LyX
- tetex
- miktex
- texlive
- texshop

sudo apt-get install tetex-base tetex-bin tetex-extra

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D. Knuth

`ftp://tug.ctan.org/pub/tex-archive/systems/knuth/dist/errata/tex82.bug`