LaTeX and Academic Typesetting

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北京工业大学程序设计集训队

- 15-minute tutorial
- 30-minute interactive exercise

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- 前北工大程序设计集训队队长（2019-2023）
- ICPC 铜牌 ×3; IEEE Xtreme World Rk 41, 85 (top 2% and 3.5 %)
- 负责 2 项国创、1 项星火
- 本科期间在国际学术会议或期刊发表论文 5 篇

- What is $\LaTeX$?
  - Some "Fancy" and "Anti-human" text editor?
  - Some language describing math formula?
  - Some paper writing system that only researchers use?

- What is Word
    - Microsoft Word is a word processor developed by Microsoft.
    - What-you-see-is-what-you-get, "wysiwyg"
- How about LATEX?
    - LaTeX is a high-quality typesetting system

- What is Word
  - Microsoft Word is a word processor developed by Microsoft.
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- How about LaTeX?
  - LaTeX is a high-quality typesetting system
- What's a typesetting system?
  - Typesetting is the composition of text for publication, display, or distribution
  - **活字印刷术**
  - Adobe InDesign

LaTeX is a high-quality typesetting system; it includes features designed for the production of technical and scientific documentation. LaTeX is the de facto standard for the communication and publication of scientific documents. LaTeX is available as free software. You don't have to pay for using LaTeX, i.e., there are no license fees, etc. But you are, of course, invited to support the maintenance and development efforts through a donation to the TeX Users Group (choose LaTeX Project contribution) if you are satisfied with LaTeX.

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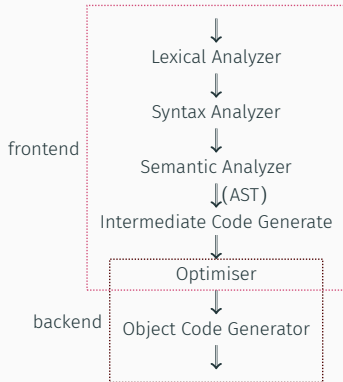
Figure 1: Comparing LATEX with Word

- TeX was developed by Donald Knuth for typesetting his book "The art of computer programming" (计算机程序设计艺术)
  - At that time, math formulas was mostly written and typesetting by hand
- Leslie Lamport created LaTeX
  - A set of macro defined around TeX
  - Provide high-level concepts, like "document class" and "packages"
- X∃LaTeX, LuaLaTeX, ...

- TeX's official pronounciation is 'tech'
  - X is χ as in χ^2 distribution
- Lay - TeX?
- Lah - TeX?
- LaTeX?
- Personally I think it doesn't matter
  - "The correct way to pronounce SQL is how your professor pronounces it"

- Out-of-the-box experience
- Easy-to-use "seperation of content and presentation"
  - You can easily switch to another template within 30 minutes
- Integrate with other softwares
  - Code highlighting
  - And even code execution

```
\begin{minted}{python}
import os
import something_else
print("easy-to-use syntax highlighting!")
\end{minted}
```

```python
import os
import something_else
print("easy-to-use syntax highlighting!")
```

frontend

| Lexical Analyzer |
| Syntax Analyzer |
| Semantic Analyzer |
| (AST) |
| Intermediate Code Generate |

backend

| Optimiser |
| Object Code Generator |

Figure 2: And – Even run and render results from other software

This slide itself!

- Nope!
  - Macro-based syntex isn't friendly
  - It'll took a day to find a missing brace (})
- New challengers:
  - Typst

- When to use LaTeX
  - Academic publishing
  - Fine-grain typesetting
    - Course Project Report
  - Just for fun
- When not to use LaTeX
  - Homeworks
    - Use Markdown with LaTeX theme
  - Drawing diagrams
  - Whenever you don't feel like

Questions?