

Scientific writing with LaTeX

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NTI

Motivating questions

- How do you write this equation in MS Word?

$$x \in \text{dom}(v) \quad \text{vars}(e) \subseteq \text{dom}(v)$$

$$(s(e) \sqcap d(e)) \sqcup \overline{PC} \sqsubseteq s(x) \sqcap d(x)$$

$$\overline{i}(e) \sqsubseteq s(x) \sqcap d(x)$$

$$v' = v \oplus \{x \mapsto \overline{v}(e)\} \quad i' = i \oplus \{x \mapsto s(e) \sqcap d(e)\}$$

$$PC \vdash \langle S, v', s, d, i' \rangle \rightarrow \langle v'', s', d', i'' \rangle$$

$$PC \vdash \langle x := e; S, v, s, d, i \rangle \rightarrow \langle v'', s', d', i'' \rangle$$

- How does it appear?

Motivating questions

- How do you centralized a figure in two column paper in MS Word?
- How much effort do you make to achieve this?

Motivating questions

- How can you get a PDF document for a part from your MS word Document?
- How much effort do you make to achieve this?

Motivating questions (Cont.)

- Can You make a general bibliography and reuse it for citation in different MS word documents?
- If yes, how much effort do you make to achieve this?

Motivating questions (Cont.)

- While writing your thesis or scientific book as a document in MS Word , can you divide it into several chapters and permit some chapters to appear while disallow the others ?

Motivating questions (Cont.)

- If you convert your MS Word Document to a pdf one, does it have different shape?

Outline

- What is LaTeX
- LaTeX versus Word
- Why LaTeX is more professional
- Using LaTeX for scientific writing
- Latex Editors
- Conclusion
- References

What is LaTeX ?

- Latex is a markup language and scientific document preparation system. It is the standard in Engineering, math and science.
- Different from what you see is what you get (wysiwyg) software like Ms word, Latex separates content from presentation.

Why Latex is more professional

- It can handle equations and formulas in very high quality
- It is open source and free software.
- It is platform independent.
- It can produce document in book quality.

Latex versus word

- The user of a word processor is under a strong temptation to lose sight of the logical structure of the text and to mix this with superficial typographical elements.
- There is no icon on your desktop saying “LaTeX” which you can click on to bring up the LaTeX program.
- There is no one particular “LaTeX editor”
- *portability,*
- *lightness,*
- *security (separate content from the layout)*
- It is free software

When is it better to use LaTeX?

It is better to use latex with large document as it is very light in comparison with word.

The LATEX language

- LATEX commands always start with a backslash: `\`
- the commands `\begin{ }` and `\end{ }` create **environments**.
- the required command arguments are placed between curly brackets: `{ }`
- optional command arguments are placed between brackets: `[]`
- comments start with a percentage symbol: `%`

A structure of .tex file

- `\documentclass[options]{document_class}`
- `% preamble`
- `\begin{document}`
- `% document`
- `\end{document}`

How does Latex work

- First, create a plaintext latex document (.tex file) using any latex editor.
- Compile your document to produce:
 - 1- PDF (*.pdf)
 - 2- Postscript file (*.PS)
 - 3- Device independent file (*.dvi)

LaTeX Editors

There many latex editors that interface to LaTeX. Some of them are free and some of them are not.

- Windows Editors

WinEdt (shareware program)

- Linux Editors

LaTeXila

- Windows/Linux editors

Texmaker-LyX-kile

Download Latex for windows

- The implementation of tex for the Windows operating system is called Miktex.

<http://www.miktex.org>

Create a simple latex document

```
\documentclass {article}  
\begin {document}  
\title {Research Statement}  
\date {}  
\maketitle  
\section {introduction}  
.....  
\end {document}
```

Conclusion

- Latex is optimum choice for writing your master or PhD thesis.
- With Latex you can use the bibtex search engines
- With Latex, you can write the complex Mathematical formulae very easily.
- With latex you can get different format form your whole document (such as dvi, pdf, ps ...) or convert from one format to another
- With latex you can get a pdf file for a part from your document.

References

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Thank you

Questions?