

Learning Latex before it's too late!

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Overview

- History of Latex
- What does it do?
- How does it work?
- Benefits of using Latex
- And problems
- Getting set up
- Hello World!



History of Latex (1)

- ~ 1977 Donald Knuth began writing Tex.
 - Designed to be a powerful and flexible typesetting utility.
 - Output equal to professional printers. (Especially good for maths)
 - Focussed on physical presentation – needed to learn lots of intricate commands.



History of Latex (2)

- Beginning of 80s, Leslie Lamport created Latex.
 - Adds layer of abstraction over standard Tex.
 - Allows author to focus on content rather than presentation.
 - Added many useful tools for automating tedious tasks (indices, bibliographies, cross-references etc.)



What does Latex do?

- Takes input from a source file (text)
- Processes the contents and decides how best to typeset the document
- Outputs device-independent (DVI) file.

- *Not interactive like word processing.*



How does Latex work? (1)

- Essentially, everything is put into a box and glued together.
- Accuracy is very high – *scaled point* is 100th of the wavelength of natural light!
- Waits until it sees everything you want to put into the document, and *then* determines the most aesthetic presentation (or, least bad is more accurate).

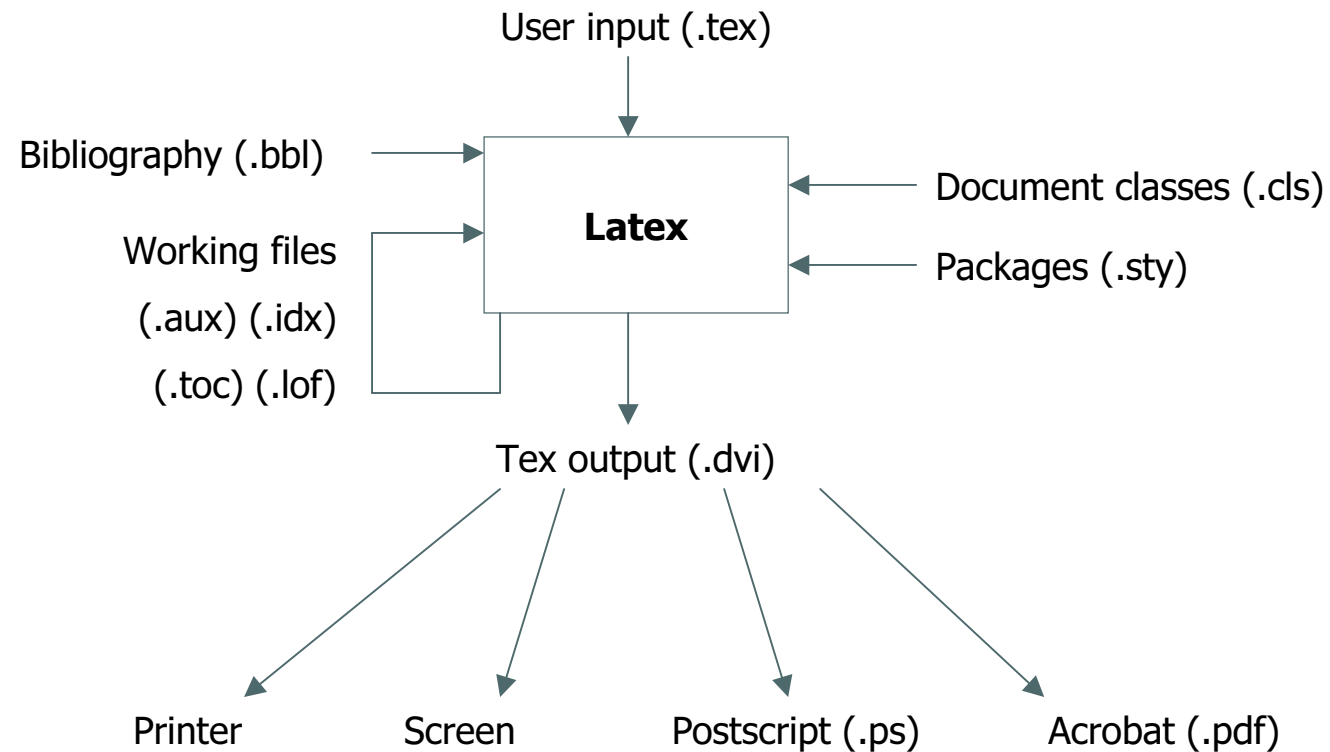


How does Latex work? (2)

- Source text is marked-up with logical structure.
- Document classes tell Latex how to format these elements.
- This is the spirit of Latex!



Latex Architecture





Markup

- Think HTML!
- Presentation markup
 - Give explicit instruction on how to display data.
- Logical markup
 - To provide semantics and structure.



Markup Advantages

- Separation of content and form
- Facilitates consistent presentation
- Can easily change document styles
 - Remember! Typography is a creative skill – leave it to the experts!
- Allows easier conversion between markup formats, e.g, Latex ➡ HTML.



Markup Disadvantages

- Need to learn markup before being able to produce basic documents.
- Markup can be easily misused, e.g., using tables as a tool for layouts (a big issue in web pages).
- Marking up more complex data, such as tables *may* take more time than a visual approach as employed by WP.



Output - DVI

- Device Independent files (.dvi).
- Designed so that output could be printed/viewed on any device:
 - > 1000dpi commercial printers
 - Dot matrix printers
 - Screen viewers (high resolution to text-only terminals)
- Can be converted easily to PS or PDF.



Benefits of Latex

- Separation of style and content (it's a good thing, honest!)
- Portability – x-platform; small files.
- Flexibility – can do anything!
- Control – do it how you want it done.
- Output – Superior to WP.
- Scalability – Big documents
- Stability – never crash and corrupt
- Cost – free!



The basics - Commands

- Command format:
`\commandname[option]{argument}`
- Arguments are mandatory
- Options are optional!
- E.g.,
`\includegraphics[width=2.5cm]{chick.eps}`



The basics – Source file

```
\documentclass{article}  
\usepackage{babel}
```

Preamble

```
\begin{document}  
\title{An Example}  
\maketitle
```

Front matter

...

Contents

Body

...

```
\begin{bibliography}
```

Back matter

...

```
\end{bibliography}
```

```
\end{document}
```



Hello World!

- Not just for programming languages!

```
% hello.tex - Our first Latex example!
```

```
\documentclass{article}
```

```
\begin{document}
```

```
Hello world!
```

```
\end{document}
```



Hello World! (2)

- Comments begin with % - ignored by Latex.
- Document classes defines the format of the document (standards included: article, book, report, letter and slides.
- Document environment encapsulates the contents. Text in-between is printed by Latex.



Special Characters

\	\textbackslash
%	\%
#	\#
&	\&
\$	\\$
{	\{
}	\}
_	_
^	\textasciicircum
~	\textasciitilde
	\textbar
<	\textless
>	\textgreater



More lingo

- Environments:

```
\begin{env-name}
```

```
...
```

```
\end{env-name}
```

- Commonly for specifying different special paragraph styles, e.g., abstract, quote. Also for more general formatting, e.g, center.



More lingo (2)

- Packages:

 - `\usepackage[package-opts]{package-name}`

 - (Always in the declared in the preamble)

 - Extends the core Latex functionality (or simplifies complex tasks).
 - Provide new commands and/or environments.
 - Many already come bundled with Latex – hundreds more available from CTAN (www.ctan.org)



More info...

- First stop:
<http://www.comp.leeds.ac.uk/andyr>
- Beware when using search engines!