WYSIWYG Systems

- What you type in can be seen directly on the screen.
- **Microsoft Office Word** is the main example of a WYSIWYG system.

Advantages/Disadvantages of WYSIWYG Systems

- WYSIWYG systems are relatively easy to use.
- In WYSIWYG systems typesetting to be done by the user.
  - Problem: most users are not professional type setters.
- In most systems (e.g. Word) you can see only the output, but not the formatting information.
  - Difficult to detect that one headline is in 11 pt and another in 12 pt, or one headline in one font, and another in a slightly different font.
  - Therefore output is usually inconsistent.
- Usually output not of printable quality.
- Programming is difficult, definition of macros restricted and difficult.

WYSIWYM

- WYSIWYM = “What You See Is What You Mean”.
- Instead of doing the typesetting directly the user says:
  - This is a headline.
  - This is a section title.
  - This text is normal text.
  - This is a mathematical formula
- Main examples: **\TeX** and **\LaTeX**.
Advantages/Disadvantages of WYSIWYM Systems

- Steeper learning curve.
- Separation of output from input, therefore what you write needs to be compiled into text.
- Can create text in print quality.
  - Many publishers print articles typeset in \LaTeX\ directly, or after adding their own generic macros.
- User sees all formatting information and can therefore produce very uniform text.
- Programmable using macros.
  - Development of macro packages for many purposes.
    - In \LaTeX\ macro packages e.g. for chess, for typesetting proofs, chemical formulas exist.
    - These slides are typeset in \LaTeX.

\LaTeX

- \TeX\ developed by Donald Knuth in order to typeset a new version of his books “The art of Computer Programming”.
- \LaTeX\ (for Lamport-\TeX) developed by Laslie Lamport in order to make a more userfriendly version of \TeX.
  - \LaTeX\ is essentially a macro package on top of \TeX.

Use of \LaTeX\ for Reports and Dissertation

- Reports and dissertations can be written using any text processing system.
- Use of \LaTeX\ will in many cases give you an advantage because of the much higher quality of the output.
- Many lecturers (but not all) use \LaTeX, especially for scientific publishing.
  - They might help you with \LaTeX.

Example

- The following shows an example of \LaTeX\ code (split into 3 codes) plus the output.
- For ease of presentation after each code piece the final output (which is only produced after running latex on the whole code) is shown.
- The source for this file is available from the webpage of CS-M00 or here: http://www.cs.swan.ac.uk/~csetzer/lectures/researchmethodology/11/exampleWikipedia.tex
Example

\documentclass[12pt]{article}
\usepackage{amsmath}
\title{LaTeX}
\author{Anton Setzer}
\thanks{Dept. of Computer Science, Swansea University, Singleton Park, Swansea SA1 4PZ, UK. Email: \{tt a.g.setzer@swan.ac.uk\}. This article is based on the example in Wikipedia, http://en.wikipedia.org/wiki/LaTeX}
\date{7 October 2011}
\newcommand{\role}{r^o le}

\begin{document}
\maketitle

Example (Continued)

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. \LaTeX{} plays an important \role{} in publishing scientific articles in Science.

% This is a comment; it will not be shown
% in the final output.

\begin{equation}
E = mc^2
\end{equation}
\begin{equation}
\frac{m}{\sqrt{1 - \frac{v^2}{c^2}}}
\end{equation}
Example (Continued)

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

\begin{align}
E &= mc^2 \\
\frac{m}{m_0} &= \frac{\sqrt{1-\frac{v^2}{c^2}}}{\sqrt{1-\frac{v^2}{c^2}}}
\end{align}
\end{document}

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LATEX

Anton Setzer

7 October 2011

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 LATEX2e. LATEX plays an important role in publishing scientific articles in Science.

\begin{align}
E &= mc^2 \\
\frac{m}{m_0} &= \frac{\sqrt{1-\frac{v^2}{c^2}}}{\sqrt{1-\frac{v^2}{c^2}}}
\end{align}

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\documentclass[12pt]{article}

Standard Header of a Latex file.

12pt = font size

article = style

(Article is suitable for reports.
There are lots of other styles.
Style “book” is the simplest style for dissertations.
– There are many more fancy ones.)

\usepackage{amsmath}

Loads package amstmath.

Rich package for mathematics, here used for command \frac.

Lots of packages are available.

\title{LaTeX}

Defines the title.

\LaTeX{} is a macro typesetting \TeX{}.

\author{Anton Setzer}

Starts defining the author (note \{ not closed yet)

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Swansea University, Singleton Park,
Swansea SA1 4PZ, UK.
Email: \tt a.g.setzer@swan.ac.uk}.

This article is based on the example in Wikipedia,
http://en.wikipedia.org/wiki/\LaTeX{}

Footnote added to author.

{\tt …} type sets this part in type writer font.

Second "} finishes definition of author.
\date{7 October 2011}

Defines the date.

\newcommand{\role}{\{r\}ôle}

Defines a macro.

From now on \role will expand to {r}ôle.

Curly brackets will be used to group text but will not be printed.

\{ô\} typesets ô

There are macros for defining lots and lots of special symbols.

http://www.tug.org/tex-archive/info/symbols/comprehensive/

Macros can have parameters as well.
\begin{document}
- Start of the content of the document.

\maketitle
- Puts title, author, date at this position.
- Without this command no title, author, date will occur in the document.

\LaTeX{} \text{is a document preparation system for the} \TeX{} \text{typesetting program. It offers ...}
- This is standard text to be typeset.
- Aligning the text done by the system.
- Line breaks in the text create only space between words.
- Double line breaks creates a paragraph
  (Equivalently one can use the macro \par).
- Several blanks, tabs, line breaks are the same as a single space
  (except for double line breaks).
- \TeX{} \text{typesets} \TeX{}.

\LaTeX{} \text{plays an important} \textit{\role{}} \text{in publishing}
- Here the user defined macro \texttt{\role{}} \textit{typeset} as \textit{rôle} is used.
- {} here makes sure that there is a blank after \LaTeX{} \text{and after rôle.}
  Spaces after a macro are ignored.
- \% This is a comment; it will not be shown
  Everything in a a line after \% is a comment

\begin{align}
\end{align}
- Example of an environment.
- There are many environments in \LaTeX{}.

\begin{align}
\end{align}
- Example of an environment.
Example (Continued)

- \begin{align}
   \cdots & \cdots \\
   \cdots & \cdots \\
\end{align}

- Environment align typesets several formulae, which are numbered as (1), (2) consecutively.
- Content of an align environment is mathematical text.
  - \LaTeX{} and \TeX{} have a text mode and a formula mode.
  - In formula mode different macros (usually for creating mathematical text) are used.
  - In mathematical text all blanks are ignored.
  - Mathematical text is where the full power of \LaTeX{}/\TeX{} is shown.
  - Seems to be the easiest system for typesetting formulae.
- \ \ \ \separates lines in mathmemtical text (can be used for ordinary text as well).
- Symbols \& mark positions to be aligned.

- \c^2
- Typesets $c^2$ in mathematical text.
- \m_0.
- Typesets $m_0$ in mathematical text.
- \begin{align}
   \frac{\cdots}{\cdots}
\end{align}
- Type sets a fraction $\frac{\cdots}{\cdots}$.
- Note that we can nest fractions.
- \end{align}
- End of align environment.
- \end{document}
- End of the document.
- Text after this will be ignored.

\LaTeX{} under Windows

- Use any texteditor. Recommended: Emacs or XEmacs.
- MikTeX is a \LaTeX{} compiler for Windows.
- For viewing dvi files use the included YAP dvi-viewer.
- For postscript use GhostScript + GSView.
- See for instance http://www.pinteric.com/miktex.html on how to use \LaTeX{} under Windows.

More Documentation

- Lots of documentation on \LaTeX{} (tutorials, userguides etc) available online.