A very shor presentation about LATEX...

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## A very short presentation about LATEX...

Merciadri Luca

University of Liège

November 17, 2008

### Outline. I

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### LATEX is...

 a free and different word processor (not like Microsoft Word);

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### LATEX is...

- a free and different word processor (not like Microsoft Word);
- coming from TEX (created by Donald E. Knuth);

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### LATEX is...

- a free and different word processor (not like Microsoft Word);
- coming from TEX (created by Donald E. Knuth);
- the evolution of TEX.

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### LATEX is...

- a free and different word processor (not like Microsoft Word);
- coming from TEX (created by Donald E. Knuth);
- the evolution of T<sub>E</sub>X.

Here is Donald E. Knuth...



# What LATEX is not...

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## What LATEX is not...

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LATEX is not...

• WYSIWYG (What You See Is What You Get);

## What LATEX is not...

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### LATEX is not...

- WYSIWYG (What You See Is What You Get);
- as easy to learn as other typesetting tools.

Why using LATEX?

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#### Why using

LATEX?

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Why using LATEX?

• quality of output (not only for formula's);

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- quality of output (not only for formula's);
- portable (Unix, Dos, Mac, Windows);

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- quality of output (not only for formula's);
- portable (Unix, Dos, Mac, Windows);
- allows you to concentrate on your document's content;

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- quality of output (not only for formula's);
- portable (Unix, Dos, Mac, Windows);
- allows you to concentrate on your document's content;
- once you know how it works, you write quicker;

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- quality of output (not only for formula's);
- portable (Unix, Dos, Mac, Windows);
- allows you to concentrate on your document's content;
- once you know how it works, you write quicker;
- it is free of charges!
- $\rightarrow$  it is used by the most of scientists who work in Applied Sciences (Mathematics, Computer Sciences, Engineering, Chemistry).

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#### Quality of output

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Quality of output...

• non-TFX document  $\rightarrow PDF^1 \rightarrow lack\ of\ quality$ ;

<sup>&</sup>lt;sup>1</sup>Portable Document Format

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Quality of output. . .

- non-TEX document  $\rightarrow$  PDF<sup>1</sup>  $\rightarrow$  lack of quality;
- $\bullet \ \ \mathsf{T}_{E}\!\mathsf{X} \ \ \mathsf{document} \ (\to \mathsf{PS}^2) \to \mathsf{PDF} \to \mathit{quality}.$



<sup>&</sup>lt;sup>1</sup>Portable Document Format

<sup>&</sup>lt;sup>2</sup>PostScript

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Quality of output. . .

- non-TEX document  $\rightarrow PDF^1 \rightarrow lack \ of \ quality$ ;
- TEX document  $(\rightarrow PS^2) \rightarrow PDF \rightarrow quality$ .

Just see this...



<sup>&</sup>lt;sup>1</sup>Portable Document Format

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Quality of output...

- non-TEX document  $\rightarrow$  PDF<sup>1</sup>  $\rightarrow$  lack of quality;
- TEX document  $(\rightarrow PS^2) \rightarrow PDF \rightarrow quality$ .

Just see this...

### Property

The Taylor serie of the hyperbolic cosecant is given by...

$$cosech(x) = \frac{1}{x} + \sum_{n=1}^{\infty} \frac{2(1 - 2^{2n-1})B_{2n}x^{2n-1}}{(2n)!}.$$
 (1)



<sup>&</sup>lt;sup>1</sup>Portable Document Format

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# Quality of output

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Quality of output...

- non-TFX document  $\rightarrow PDF^1 \rightarrow lack \ of \ quality$ ;
- TFX document  $(\rightarrow PS^2) \rightarrow PDF \rightarrow quality$ .

Just see this...

### Property

The Taylor serie of the hyperbolic cosecant is given by...

$$\operatorname{cosech}(x) = \frac{1}{x} + \sum_{n=1}^{\infty} \frac{2(1 - 2^{2n-1})B_{2n}x^{2n-1}}{(2n)!}.$$
 (1)

It is impossible to have such a finest equation in Word!



<sup>&</sup>lt;sup>1</sup>Portable Document Format

<sup>&</sup>lt;sup>2</sup>PostScript

### Portable?

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### Portable?

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### Portable?

 PDF and PS formats are used everywhere → no compatibility problems!

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other typesetting programs have as output what you see;

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- other typesetting programs have as output what you see;
- LATEX obliges you to divide in blocks your document:

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- other typesetting programs have as output what you see;
- LATEX obliges you to divide in blocks your document:
  - parts;

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- other typesetting programs have as output what you see;
- LATEX obliges you to divide in blocks your document:
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  - chapters;

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- other typesetting programs have as output what you see;
- LATEX obliges you to divide in blocks your document:
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  - chapters;
  - sections:

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- other typesetting programs have as output what you see;
- LATEX obliges you to divide in blocks your document:
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  - subsections;

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- other typesetting programs have as output what you see;
- LATEX obliges you to divide in blocks your document:
  - parts;
  - chapters;
  - sections;
  - subsections;
  - subsubsections;

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- other typesetting programs have as output what you see;
- LATEX obliges you to divide in blocks your document:
  - parts;
  - chapters;
  - sections;
  - subsections;
  - subsubsections;
- LATEX automatically makes the hyphenations when necessary;

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- other typesetting programs have as output what you see;
- LATEX obliges you to divide in blocks your document:
  - parts;
  - chapters;
  - sections;
  - subsections;
  - subsubsections;
- LATEX automatically makes the hyphenations when necessary;
- LATEX can send the reader dynamically (e.g. see p. XX);

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- other typesetting programs have as output what you see;
- LATEX obliges you to divide in blocks your document:
  - parts;
  - chapters;
  - sections;
  - subsections;
  - subsubsections;
- LATEX automatically makes the hyphenations when necessary;
- LATEX can send the reader dynamically (e.g. see p. XX);
- LATEX automatically numbers equations, proofs, theorems, etc.;

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Focusing on my document?

- other typesetting programs have as output what you see;
- LATEX obliges you to divide in blocks your document:
  - parts;
  - chapters;
  - sections;
  - subsections;
  - subsubsections;
- LATEX automatically makes the hyphenations when necessary;
- LATEX can send the reader dynamically (e.g. see p. XX);
- LATEX automatically numbers equations, proofs, theorems, etc.;
- and so on...

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With LATEX, you write quicker.

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#### Writing quicker

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With LATEX, you write quicker. Once you know the rudimentary instructions...

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### Writing quicker

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A classical article Code Explanation Complements A classical presentation Structure With LATEX, you write quicker. Once you know the rudimentary instructions...

• you type math. equations without worrying about it;

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### Writing quicker

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A classical article Code Explanation Complements A classical presentation Structure Example With LaTeX, you write quicker. Once you know the rudimentary instructions. . .

- you type math. equations without worrying about it;
- you don't have to verify your document's presentation.

### Structure of a classical article - code.

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A LATEX article has a code like this...

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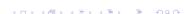
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### Structure of a classical article - code.

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```

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## Structure of a document

#### A classical article Code

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```
A LATEX article has a code like this...
```

```
\documentclass[10pt,a4paper,final,oneside]{article}
\usepackage[latin1]{inputenc}
\usepackage[francais.english]{babel}
\title{The Title}
\date{\today} % the comments are here
\author{The Author}
\location{The Location}
\email{name@provider.com}
\begin{document}
\maketitle
\chapter{\ldots}
Here is some text about the first chapter.
11
We will see the following things, in this order:
\begin{enumerate}
\item Example 1:
\item Example 2.
\end{enumerate}
After, we will speak about these things, but with no order:
\begin{itemize}
\item Example 1;
\item Example 2.
\end{itemize}
\section{\ldots}
As everybody knows, if $a=b$, and that $b=c$, we have the following formula:
\begin{equation}
a=c.
\end{equation}
```

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Now, see what all these instructions mean...

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Now, see what all these instructions mean...

\documentclass[]{}

→ represents the class of the document.

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Now, see what all these instructions mean...

\documentclass[]{}

 $\rightarrow$  represents the class of the document.

\usepackage[]{}

ightarrow allows the user to use a package.

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Now, see what all these instructions mean...

\documentclass[]{}

 $\rightarrow$  represents the class of the document.

\usepackage[]{}

 $\rightarrow$  allows the user to use a package.

\title{}

 $\rightarrow$  allows the user to give a title to his document.

Merciadri Luca

Explanation

Now, see what all these instructions mean...

\documentclass[]{}

→ represents the class of the document.

\usepackage[]{}

→ allows the user to use a package.

\title{}

 $\rightarrow$  allows the user to give a title to his document.

\begin{document}

→ begins the document.

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Now, see what all these instructions mean...

\documentclass[]{}

 $\rightarrow$  represents the class of the document.

\usepackage[]{}

 $\rightarrow$  allows the user to use a package.

\title{}

 $\rightarrow$  allows the user to give a title to his document.

\begin{document}

 $\rightarrow$  begins the document.

\maketitle

→ prints the title in the document.

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Now, see what all these instructions mean. . .

\documentclass[]{}

 $\rightarrow$  represents the class of the document.

\usepackage[]{}

 $\rightarrow$  allows the user to use a package.

\title{}

 $\rightarrow$  allows the user to give a title to his document.

\begin{document}

 $\rightarrow$  begins the document.

\maketitle

 $\rightarrow$  prints the title in the document.

\part{nameofpart}

 $\rightarrow$  makes the text which follows this intruction being a part (named

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"nameofpart"), until the following instruction of part.

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\include{externalfile}

 $\rightarrow$  includes another TeXfile (here "externalfile.tex") in the document, at this place.

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\include{externalfile}

 $\rightarrow$  includes another TEXfile (here "externalfile.tex") in the document, at this place.

\$a\$

 $\rightarrow$  tells LATEX that *a* is a math. element. You **must** put the \$\$ between a math. element in LATEX.

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Complement A classical presentation Structure Example \include{externalfile}

 $\rightarrow$  includes another TEXfile (here "externalfile.tex") in the document, at this place.

\$a\$

 $\rightarrow$  tells LATEX that a is a math. element. You **must** put the \$\$ between a math. element in LATEX.

\begin{equation}
a=c.

\end{equation}

 $\rightarrow$  is a very important environment; it is useful for long equations, such as the one we wrote for cosh(x).

```
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```

Luca

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\include{externalfile}

 $\rightarrow$  includes another TEXfile (here "externalfile.tex") in the document, at this place.

\$a\$

 $\rightarrow$  tells LATEX that a is a math. element. You **must** put the \$\$ between a math. element in LATEX.

\begin{equation}
a=c.

\end{equation}

 $\rightarrow$  is a very important environment; it is useful for long equations, such as the one we wrote for cosh(x).

\end{document}

ends the document.

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• There are lots of other commands;

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- There are lots of other commands;
- for typing equations (either in \$\$ or in equation environment), there is a plain notation.

Here are a few examples...

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Inserting images

- There are lots of other commands;
- for typing equations (either in \$\$ or in equation environment), there is a plain notation.

Here are a few examples. . .

- $a^{u}$
- $\rightarrow$  means a to the power  $u(a^u)$ .

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- $a_{u}$
- $\rightarrow$  means that u is below  $a \left( \frac{a_u}{a} \right)$ .

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Complements

- There are lots of other commands;
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- \sqrt{a}
- $\rightarrow$  means that we take the square root of  $a(\sqrt{a})$ .

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Complements

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- $\rightarrow$  means that we take the square root of  $a(\sqrt{a})$ .
- \int {a}^{b} \sin(x)\mathrm dx
- $\rightarrow$  means that we take the integral of  $\sin(x)$  between a and b  $(\int_a^b \sin(x) dx).$

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A presentation follows nearly the same instructions as for an article, but there are a few new instructions. Some of these new instructions are:

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A presentation follows nearly the same instructions as for an article, but there are a few new instructions. Some of these new instructions are:

\documentclass{beamer}

 $\rightarrow$  the document's class is not the same as before.

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\documentclass{beamer}

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\begin{frame}

 $\rightarrow$  begins a frame.

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Structure

A presentation follows nearly the same instructions as for an article. but there are a few new instructions. Some of these new instructions are:

\documentclass{beamer}

→ the document's class is not the same as before.

\begin{frame}

 $\rightarrow$  begins a frame.

\frametitle{example}

 $\rightarrow$  gives the name "example" to this frame.

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Example

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\documentclass{beamer}

 $\rightarrow$  the document's class is not the same as before.

\begin{frame}

 $\rightarrow \text{ begins a frame}.$ 

\frametitle{example}

 $\rightarrow$  gives the name "example" to this frame.

To make a specific item (e.g. the item "example 2") only appearing on frames x, and y (if they exist), you have to write:

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Structure

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\documentclass{beamer}

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\begin{frame}

 $\rightarrow$  begins a frame.

\frametitle{example}

→ gives the name "example" to this frame.

To make a specific item (e.g. the item "example 2") only appearing on frames x, and y (if they exist), you have to write:

\item<x,y> example 2

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To put a specific text on a specific frame (x), we will use:

# Structure of a classical presentation (2/2).

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To put a specific text on a specific frame (x), we will use:

\only<x>{specific text}

# Example of a classical presentation.

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Code

Example

This presentation is totally written using LATEX thanks to MikTFX distribution on Windows XP.

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Inserting images in LATEX documents is a little bit fair-haired but keep in mind that...

have to use a command like:

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Inserting images in LATEX documents is a little bit fair-haired but keep in mind that... If you convert  $T_EX \rightarrow PS \rightarrow PDF$  (normal conversion), you

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\begin{figure}[h]
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\end{figure}
```

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#### Precisions:

• don't forget the "figure" environment;

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- you must include the package "graphicx" in the preamble;
- "scale" means "échelle" (ratio);
- your picture must be in PNG format;
- the "caption" command gives a legend to the image;

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- you must include the package "graphicx" in the preamble;
- "scale" means "échelle" (ratio);
- your picture must be in PNG format;
- the "caption" command gives a legend to the image;
- don't forget to close the "figure" environment!

# Inserting images – Example.

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Here is an example of six different real functions. You can see that the graph is perfect.

# Inserting images – Example.

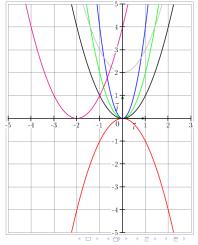
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Here is an example of six different real functions. You can see that

the graph is perfect.



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LΔT<sub>E</sub>X . . .

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#### ₽T<sub>F</sub>X ...

• all the commands begin with a slash;

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#### LATEX ...

- all the commands begin with a slash;
- very useful for reports, whatever you want to speak about;

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#### LATEX ...

- all the commands begin with a slash;
- very useful for reports, whatever you want to speak about;
- very easy to write equations if you are a little bit motivated.

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#### LATEX ...

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- very easy to write equations if you are a little bit motivated.

# ADOPT LATEX!

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→ interesting characteristics:

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• Why is LATEX so nice?

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→ interesting characteristics:

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- portable;

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- Why is LATEX so nice?
  - → interesting characteristics:
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    - portable;
    - allows you to concentrate;

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    - once you know how it works, you write quicker;

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    - it is free of charges!
- Can you guess what does WYSIWYG means?

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- Can you guess what does WYSIWYG means?
  - → "What You See Is What You Get". When you change the style of the document, you *directly* see it (Word). It is not the case in LaTeX.

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- What are the output formats of LATEX ?  $\rightarrow$  they are 2:

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- What are the output formats of LATEX ?  $\rightarrow$  they are 2:
  - PDF (Portable Document Format);
  - PS (PostScript).

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#### • Why is LATEX so nice?

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- What is the aim of the include command?

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  - 2 PS (PostScript).
- What is the aim of the include command?
- $\rightarrow$  includes another T<sub>E</sub>X file in the document, at the place where it is used.

# Bibliography.

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Complements A classical presentation Structure Example There is only the point 3, page 12, which comes from the two following references. There are plenty other references on the Web!



Marc Baudoin.

Apprends latex !, 1997.

Ecole nationale supérieure de techniques avancées.



Maxime Bonjean.

Introduction to latex, 2006.

ULg.

This presentation is also available at

http://www.student.montefiore.ulg.ac.be/~merciadri.