LaTeX Workshop

University of Toronto, Mississauga

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- LaTeX is a program designed to produce high-quality typesetting especially for mathematics.

- It takes a computer file, prepared according to the "rules" of TeX:

  - And converts it to a form that may be printed on a high-quality printer or PDF to produce a printed document of publication quality.

How does LaTeX work?

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- In typical "WYSIWYG" text processors, such as Microsoft Word or Word Perfect:
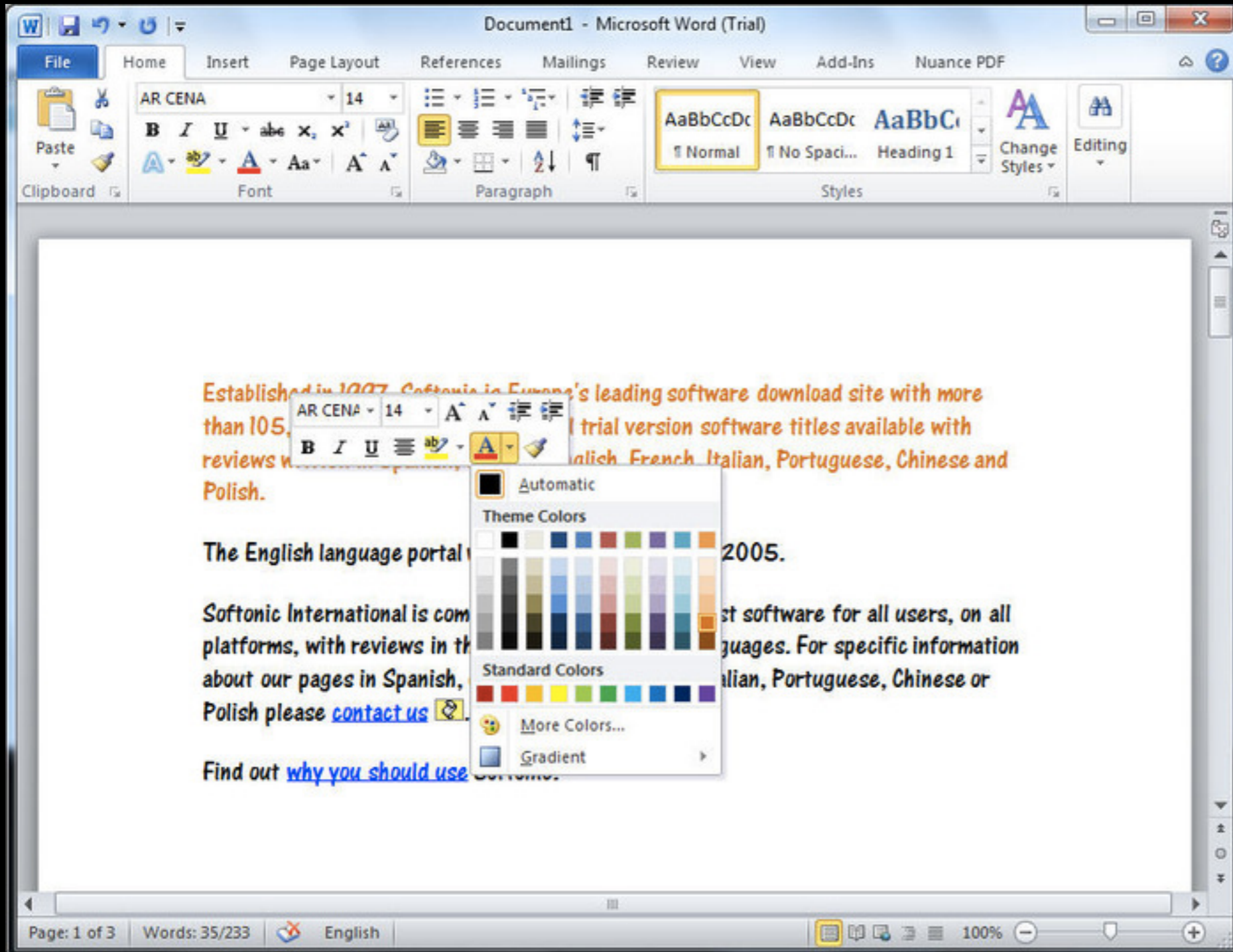
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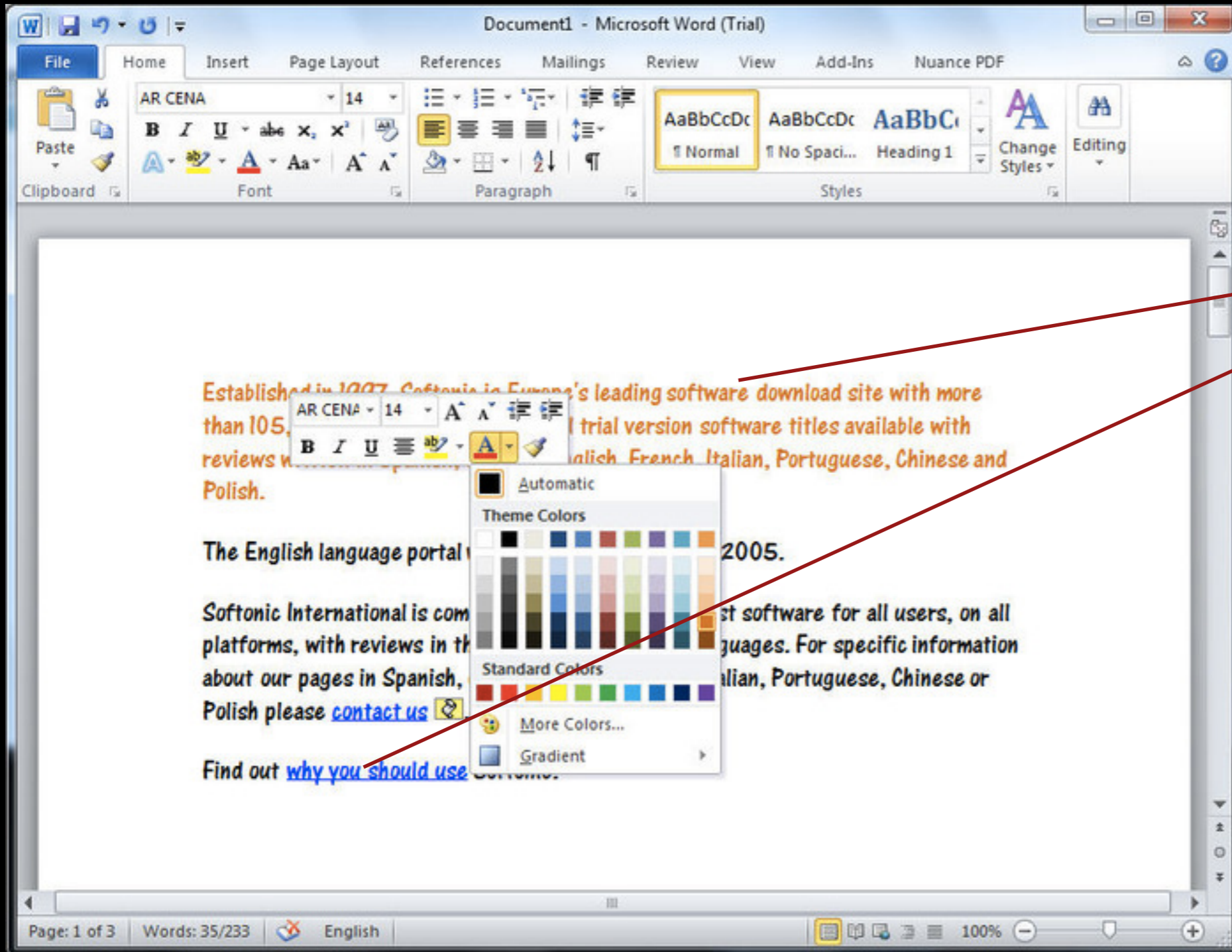   - Formatting commands are **invisible**.

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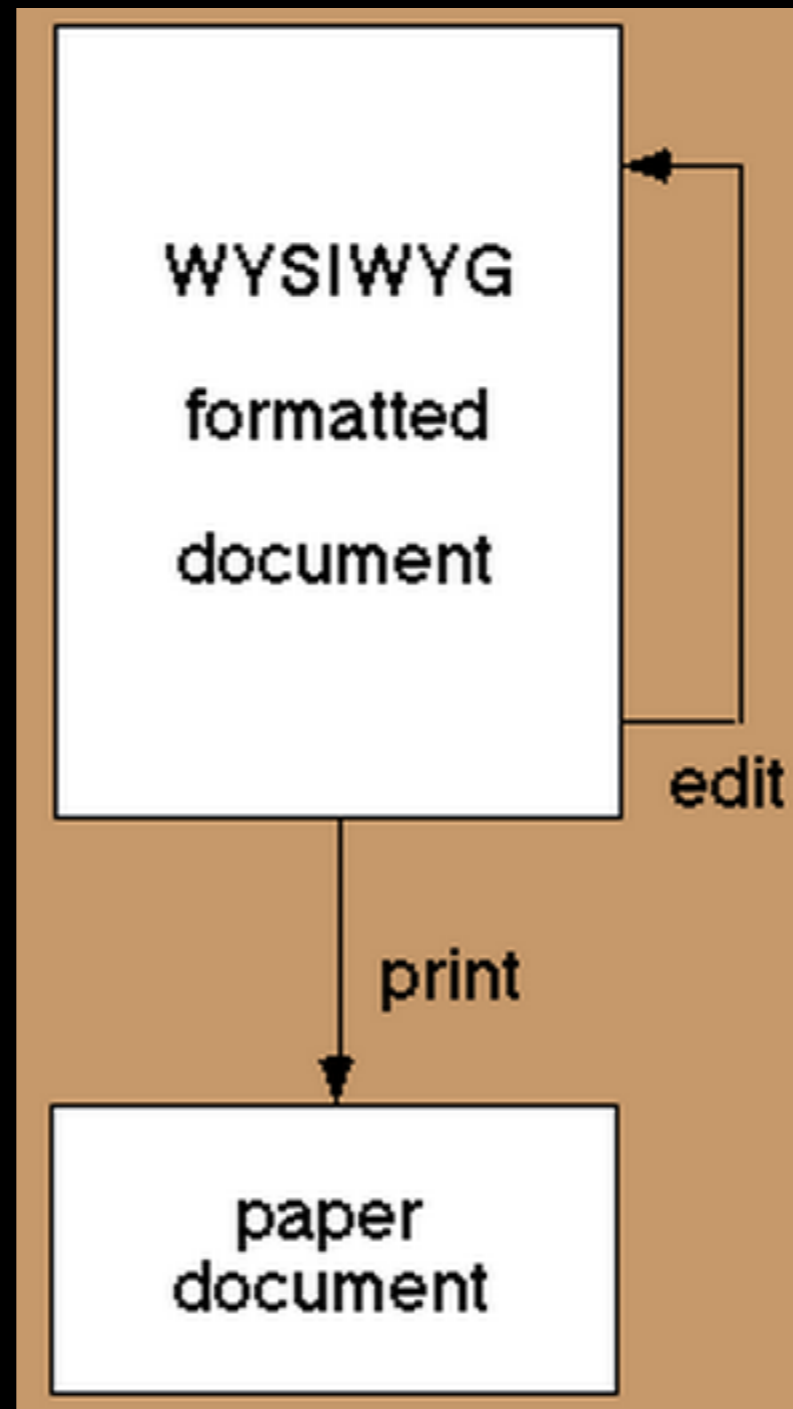 - The file shows pretty much the final result.

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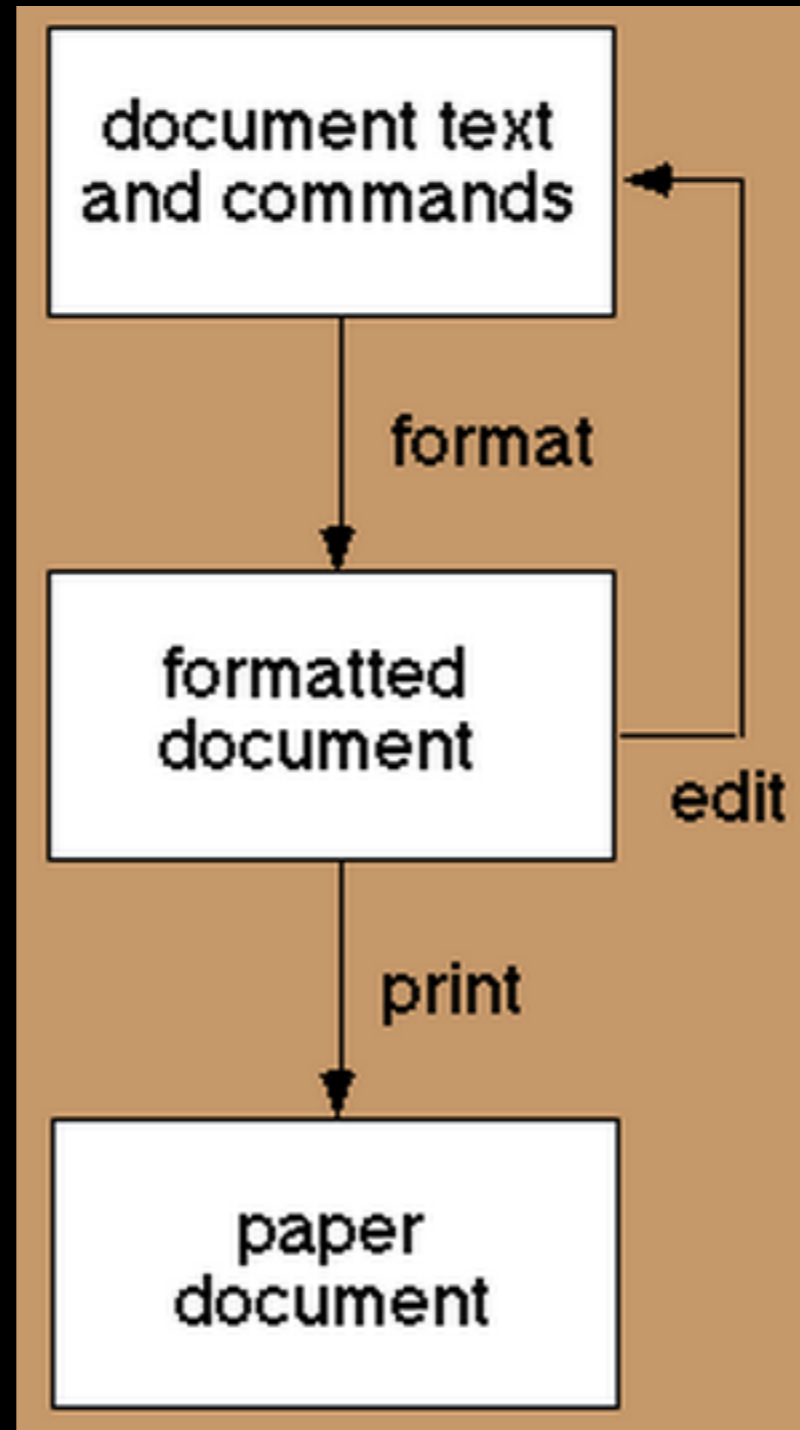
    - The formatting commands are **visible**.

- The process requires a compiler to format the final result.

How does LaTeX work?

A Typical LaTeX file

```
\documentstyle{article}
    \begin{document}
    ``Well, in OUR country,'' said Alice, still panting
    a little, ``you'd generally get to somewhere else -- if
    you ran very fast for a long time, as
    we've been doing.''

    ``A slow sort of country!'' said the Queen.
    ``Now, HERE, you see, it takes all the
    running YOU can do, to keep in the same
    place.  If you want to get somewhere else,
    you must run at least twice as fast as that!''
    \end{document}
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The preamble consists of the overall, document-wide LaTeX formatting commands.

```
\begin{document}
```

body

```
\end{document}
```

The body contains the text of the document and text formatting commands.

ShareLaTeX

- 1. Go to www.sharelatex.com

- 2. Register and create a free account.

- 3. Create a new project and lets call it 'HelloWorld'

- 4. More details are available here:

  https://www.sharelatex.com/learn/ Creating_a_document_in_ShareLaTeX

DEMO1: Hello World in LaTeX

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- Some text characters must be generated by control sequences (i.e., quotes, {}, [], \, etc.).

Body Structure

Document text:

`\begin{document}`

.

.

.

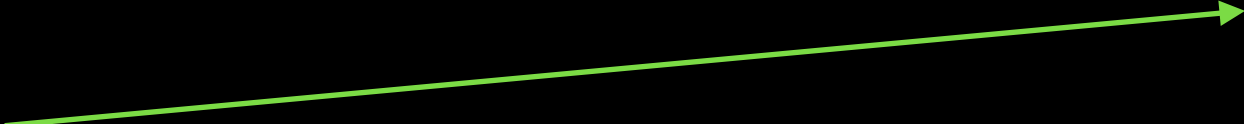`\end{document}`.

Body Structure

Document text:

`\begin{document}`

.
.
.
.
.

`\end{document}.`

You can put pretty much anything in between as long as it conforms to TeX (LaTeX) rules.

DEMO2: Basic Formatting in LaTeX

```
\documentclass{article}
\begin{document}

\begin{abstract}
This is a simple paragraph at the beginning of the
document. A brief introduction about the main subject.
\end{abstract}

In this document some extra packages and parameters
were added. There is a encoding package
an a pagesize and fontsize parameters.

This line will start a second Paragraph. And I can
 brake\\ the lines \\and continue in a new line.

\end{document}
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New Lines

```
\end{document}
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Environments are used to format blocks of text in a LATEX documents.

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- The abstract environment will put the text in a special format at the top of your document.

- Environments are used by an opening tag `\begin` and a closing tag `\end`.

  - Everything inside those tags will be formatted in a special manner depending on the type of the environment.

DEMO3: Basic Formatting in LaTeX

```
Some of the \textbf{greatest}
discoveries in \underline{science}
were made by \textbf{\textit{accident}}.
```

- To make a text italic is straightforward, use the `\textit` command.

- To make a text bold use `\textbf` command.

- Underlining text is very simple too, use the `\underline` command.

Mathematical Expressions

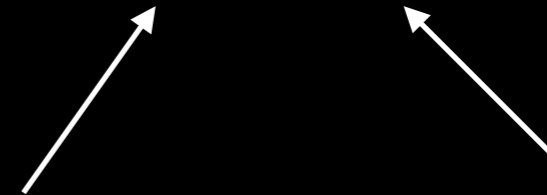The well known Pythagorean theorem $\(x^2 + y^2 = z^2\)$ was
proved to be invalid for other exponents.
Meaning the next equation has no integer solutions:

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proved to be invalid for other exponents.
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Display mode: used to write expressions that are not
part of a text or paragraph, and are therefore put on separate lines

Mathematical Expressions

description	code	examples
Greek letters	\alpha \beta \gamma \rho \sigma \delta \epsilon	α β γ ρ σ δ ϵ
Binary operators	\times \otimes \oplus \cup \cap	$\times$ $\otimes$ $\oplus$ $\cup$ $\cap$
Relation operators	< > \subset \supset \subseteq \supseteq	$<$ $>$ $\subset$ $\supset$ $\subseteq$ $\supseteq$
Others	\int \oint \sum \prod	$\int$ $\oint$ $\sum$ $\prod$

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Mathematical Expressions

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\documentclass{article}
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Definite integrals are some of the most common
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In the MathDisplayMode

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Using the \int command for the Integral sign

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Limits of our integral.
_ is used for subscript
^ is used for superscript.

0 is the lower integral (subscript)
1 is the upper integral (superscript)

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The expresson to integrate

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I need a space!!

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What do you think this renders as?
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\documentclass{article}
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Summation Sign

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Lower value on the summation i=1

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Upper value on the summation is infinity

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The fraction command i.e. someNumerator/someDenominator

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The value of the numerator

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The value of the denominator

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The prod command for the series multiplication sign.

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Numerator of the
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Denominator of the fraction

References

- Material to prepare this workshop is from:

- 1) https://www.sharelatex.com/learn/Main_Page

  I highly recommend going to the above link as it has tons of useful material.

- 2) http://www.cs.cornell.edu/info/misc/latex-tutorial/latex-home.html