My First Latex Document

April 6, 2025

Mibin Benny
S2CS
45
February 2025

1 Introduction

1.1 What is Latex?

LaTeX often stylized as LaTeX) is a software system for typesetting documents. LaTeX markup describes the content and layout of the document, as opposed to the formatted text found in WYSIWYG word processors like Google Docs, LibreOffice Writer, and Microsoft Word. The writer uses markup tagging conventions to define the general structure of a document, to stylize text throughout a document, and to add citations and cross-references.

1.2 What is *typesetting* program?

To answer this question let us look in various stages of documentation with latex

1. Text is entered into the computer
2. Input text is formatted into lines, paragraphs and pages
3. The output text is displayed on the computer screen
4. Final output is printed

Typesetting refers to the process of arranging and formatting text on a page to ensure that it is visually appealing, readable, and organized. It involves choosing the right fonts, adjusting line spacing, managing margins, and determining the layout of paragraphs, headings, and images.

1.3 Why learn latex?

- Professional grade typography
- Superior math type setting
- Consistent formatting throughout the document

2 Comparison of latex document with MS Word

Features	MS Word	Latex
Ease of use	User-Friendly Interface	Required knowledge of commands and syntax
Customization	Limited to bult-in formatted tools	Highly customizable through coding
Mathematical typesetting	Basic support for equations (equation editor)	Excellent support for complex equations

Table 1: Comparison Table

3 Equations in latex

Mathematical equations can be written in different ways. For example,an inline equation such as $E = mc^2$ can be included within a sentence. A standalone equation is written as follows:

$$F = ma \tag{1}$$

Some other examples:

1. Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \tag{2}$$

2. Pythagorean Theorem

$$a^2 + b^2 = c^2 \tag{3}$$

3. A Summation Formula

$$\sum_{k=1}^{n} k^2 = \frac{n(n+1)(2n+1)}{6} \tag{4}$$

3.1 Multiline Equations

If equation is too long, we can split it across multiple lines:

$$a^2 + b^2 = c^2 \tag{5}$$

$$\tag{6}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \tag{7}$$

4 Special Symbols and Characters

LaTeX allows the use of special symbols and characters such as:

- Greek Letters: $\alpha, \beta, \gamma, \pi, \sigma$
- Set Symbols: $\in, \notin, \subseteq, \supseteq$
- Logical Symbols: $\forall, \exists, \neg, \wedge, \vee$
- Operators :$\sum, \prod, \int, \oint$
- Special Characters: # $ % & _ { } ~ \