What is LaTeX?

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February 17, 2026

What is LaTeX?

- LaTeX is a document preparation system used to create professional documents.
- It is especially popular in mathematics, computer science, physics, and engineering.
- Unlike Microsoft Word, LaTeX focuses on structure rather than visual formatting.
- Users write code that is compiled into a high-quality PDF.

The History of LaTeX

- LaTeX is based on a typesetting system called TeX.
- TeX was created in 1978 by computer scientist Donald Knuth.
- Knuth created TeX because he was unhappy with how mathematical books were being printed.
- In the 1980s, Leslie Lamport developed LaTeX to make TeX easier to use.

How LaTeX Was Developed

- TeX was powerful but difficult to use.
- Leslie Lamport created LaTeX as a set of macros built on top of TeX.
- These macros simplified document formatting.
- LaTeX allowed users to focus on content instead of layout.
- Today, LaTeX is maintained by a global open-source community.

How LaTeX Works

- You write plain text mixed with LaTeX commands.
- Commands begin with a backslash (e.g., \section).
- The file is saved as a .tex file.
- A compiler processes the file and generates a PDF.
- The compiler interprets structure, formatting, and layout automatically.

Example of Basic LaTeX Code

```
\documentclass{article}

\begin{document}
\section{Introduction}
Hello World!
\end{document}
```

This simple code generates a formatted document with a section title.

Why LaTeX is Powerful

- Produces professional, publication-quality documents.
- Handles complex mathematical equations easily:

$$\int_0^\infty e^{-x} dx = 1$$

- Automatically numbers sections, equations, and figures.
- Manages references and bibliographies efficiently.
- Ideal for long research papers and theses.

What is Beamer?

- Beamer is a LaTeX document class used to create presentations.
- Instead of writing slides manually, you code them.
- Each slide is created using the frame environment.
- Beamer allows themes, transitions, and structured formatting.
- It is widely used for academic conference presentations.

Each frame becomes one slide in the final PDF.

Advantages and Conclusion

- LaTeX separates content from design.
- It ensures consistent formatting throughout a document.
- It is the standard tool for many academic journals.
- Beamer makes professional presentations possible using code.
- Learning LaTeX is valuable for STEM students and researchers.

Thank you!