Department of Computer Science & Engineering

Assignment on LaTeX

Course Name:Technical Writing and Presentation

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Chapter 1

Introduction

LAT_EX

Latex(pronounced lay-tek) is a document preparation system for producing professional-looking documents, it is not a word processor. It is particularly suited to producing long, structured documents, and is very good at type-setting equations. It is available as free software for most operating systems. LATEX is based on TEX, a typesetting system designed by Donald Knuth in 1978 for high quality digital typesetting. TEX is a low-level language that computers can work with, but most people would find difficult to use; so LATEX has been developed to make it easier.

If you are used to producing documents with Microsoft Word, you will find that LATEX is a very different style of working. Microsoft Word is 'What You See Is What You Get' (WYSIWYG), this means that you see how the final document will look as you are typing. When working in this way you will probably make changes to the document's appearance (such as line spacing, headings, page breaks) as you type. With LATEX you do not see how the final document will look while you are typing it — this allows you to concentrate on the content rather than appearance.

Chapter 2

Core Content

2.1 The Basic of Latex

LaTeX is a powerful typesetting system used primarily for technical and scientific documents. Unlike word processors, LaTeX separates content creation from formatting, allowing authors to focus on the text while LaTeX manages the layout and style. Here are some foundational concepts that help new users get started with LaTeX:

2.2 Document Structure

A LaTeX document typically begins with a preamble where you set up the document class, load packages, and define any necessary settings. The preamble might look like this:

```
\documentclass{report}
\usepackage{graphicx} % For including images
```

After the preamble, the document content is written within the 'document' environment. The basic structure looks like this:

```
\begin{document}
% Content goes here
\end{document}
```

2.2.1 Formatting Text

LaTeX provides several commands for text formatting. Some common commands include:

- **Bold text**
- *Italic Text*
- <u>underline text</u>

You can combine these commands for more complex formatting, such as '***bold and italic***'.

2.2.2 Creating Sections and Subsections

In LaTeX, you can organize content using sections, subsections, and subsubsections. Each level of sectioning is automatically numbered and added to the table of contents (if you include one):

```
\section{Main Section}
\subsection{Subsection}
\subsubsection{Subsubsection}
```

2.2.3 Mathematical Expressions

One of LaTeX's most powerful features is its ability to typeset complex mathematical equations. Math expressions are placed between dollar signs for inline math, or in a dedicated 'equation' environment for display equations:

```
inline math: (E = mc^2 )
display math :
\begin{equation}
  a^2 + b^2 = c^2
\end{equation}
```

2.2.4 Including image and Figures

To insert images, use the 'graphicx' package and the 'figure' environment:

```
\begin{figure}[h]
    \centering
    \includegraphics[width=0.5\textwidth]{image.png}
    \caption{An example image}
    \label{fig:example}
\end{figure}
```

These are the basics of working with LaTeX. By mastering these elements, you can create well-structured, professional-looking documents that are easy to read and navigate.

2.3 Advance Features

2.3.1 Text Formatting, Lists, and Quotations

Here are some ways to format text: SMALL CAPS TEXT, *Slanted Text*, and ***Italic and Bold*** for emphasis.

2.3.2 Why LaTeX is Awesome

1. High-quality typesetting

2. Efficient management of references

3. Strong support for complex equations and formatting

2.3.3 Core Features

- **Ease of Use**

  – Simple document structure

  – Easy to write and edit content

- **High quality output**

  – Simple document structure

  – Easy to write and edit content

- **Customization**

  – Simple document structure

  – Easy to write and edit content

- **Quote**

  > *"Good design is as little design as possible."*
  > — Dieter Rams

2.3.4 Table

Features	Pros	Cons
Ease of Use	Simple to learn and use	Limited functionality
High-Quality Output	Produces professional documents	Requires time to learn
Customization	Highly customizable with packages	Can be complex for simple tasks

Table 2.1: Sample Table Showing Features, Pros, and Cons

2.3.5 Figures

(a) This is a *Purple* flower.

(b) This is a *Orange* flower.

Figure 2.1: Beautiful flower images

2.3.6 Equations and Expressions

Here we demonstrate some mathematical expressions.

$$ax^2 + bx + c = 0 \tag{2.1}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \tag{2.2}$$

$$\sum_{i=1}^{n} i = \frac{n(n+1)}{2} \quad \int_{0}^{\infty} e^{-x} \, dx = 1$$

$$\begin{bmatrix} a & b \\ c & d \end{bmatrix}$$

Chapter 3

Summary

In summary, LaTeX is an invaluable tool for creating well-structured and visually appealing documents, particularly in academic and professional settings. Its ability to handle complex formatting, including mathematical expressions, tables, and references, sets it apart from standard word processors. The separation of content and formatting enables authors to focus on their writing while maintaining a consistent and polished appearance. Additionally, the extensive library of packages enhances its functionality, allowing for customized layouts and styles. Overall, LaTeX empowers users to produce high-quality publications that meet rigorous academic standards, making it a preferred choice for researchers and scholars worldwide.

Chapter 4

References

This is my first reference [Knuth, 1984]
This is my first reference [Lamport, 1994]

Bibliography

Donald Knuth. *The T$_{\!E}$Xbook*. Addison-Wesley, 1984.

Leslie Lamport. Latex: A document preparation system. *Addison-Wesley*, 1994.