Rajeev Institute of Technology

Technical Writing using LaTeX

Comprehensive Report

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Supervisor: **Supervisor Name**

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Certificate

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CERTIFICATE

This is to certify that Mr./Ms. Hemanth S.P has successfully completed the project titled **"Technical Writing using LaTeX"** under the guidance of **Supervisor Name** in partial fulfillment of the requirements for the award of the degree of Bachelor of Engineering in Computer Science and Engineering of Visvesvaraya Technological University, Belagavi, Karnataka.

Signature of Guide **Signature of HOD** **Signature of Principal**

Abstract

This report demonstrates the importance and usage of LaTeX in academic and technical documentation. LaTeX, known for its typesetting quality, is widely used for producing scientific and mathematical documents due to its powerful handling of formulas, bibliographies, and structured content.

This work includes examples across 11 chapters, explaining each concept through code and rendered output. Chapters explore document design, equation typesetting, theorem environments, tables and graphics handling, algorithms using pseudo-code, and bibliographic citations. The final sections emphasize how all these elements synergize in producing professional-quality reports and theses.

The goal is to familiarize students with LaTeX basics and advanced features to create well-organized and publish-ready documents.

Contents

Chapter 1

Introduction

1.1 Simple Document

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eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa. LaTeX provides a robust solution for creating high-quality documents. A typical LaTeX document consists of a preamble (for setting document class and loading packages) and the content body. LaTeX enforces structure through sections, chapters, and logical divisions, which is essential in academic writing.

1.2 Importance of LaTeX

LaTeX separates content from presentation. This allows writers to focus on the document's logical flow while LaTeX handles formatting. Unlike WYSIWYG word processors, LaTeX encourages structured and clean documents.

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Chapter 2

Abstract/Summary

2.1 Sample Abstract

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Chapter 3

Title and Certificate Pages

3.1 Title Page

The title page is structured using the `titlepage` environment. It includes the university name, report title, author, supervisor, and submission date. This sets the first impression of your report.

3.2 Certificate Page

The certificate authenticates the student's work and is signed by the guide, HOD, and principal. It confirms the submission of original work under proper guidance.

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Chapter 4

Tables

4.1 Student Marks Table

Sl	USN	Student Name	Subject1	Subject2	Subject3
1	4XX22XX001	Name1	89	60	90
2	4XX22XX002	Name2	78	45	98
3	4XX22XX003	Name3	67	55	59

Table 4.1: Student Marks

Tables in LaTeX are structured using the `tabular` environment. Borders, alignment, and formatting options give full control over presentation.

Chapter 5

Graphics

5.1 Side-by-Side Images

(a) Image 1

(b) Image 2

Figure 5.1: Side-by-side Images

The `graphicx` package enables image inclusion and manipulation. Using `subcaption`, we can arrange multiple images neatly side-by-side.

Chapter 6

Mathematical Equations

6.1 Einstein's Mass-Energy Equivalence

$$E = mc^2 \tag{6.1}$$

6.2 Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \tag{6.2}$$

LaTeX excels at rendering complex equations using the `amsmath` package.

Chapter 7

Theorems and Definitions

7.1 Sample Theorem

Theorem 7.1 (Accessible Pointed Graph)**.** *Consider an XML database D and a twig query q with only ancestor, descendant relationships in branching edges. The worst-case I/O complexity is decided by the number of holistic nodes in the path algebra.*

7.2 Sample Corollary

Corollary 7.1.1. *Every valid subtree extracted from an accessible pointed graph satisfies the uniqueness constraint in XML.*

7.3 Sample Lemma

Lemma 7.2. *Every connected acyclic graph has at least one leaf node.*

7.4 Sample Definition

Definition 7.4.1. *A tree is a connected graph without cycles.*

Chapter 8

Citations and Bibliography

8.1 Sample Citations

As discussed in [3], LaTeX provides a high-quality typesetting system. Further details can be found in [1] and [2].

8.2 Bibliography

Bibliography

[1] Donald E. Knuth. *The TeXbook*. Addison-Wesley, 1984.

[2] Leslie Lamport. *LaTeX: A Document Preparation System*. Addison-Wesley, 1994.

[3] Frank Mittelbach and Michel Goossens. *The LaTeX Companion*. Addison-Wesley, 2nd edition, 2004.

Chapter 9

Algorithms

9.1 Sample Algorithm

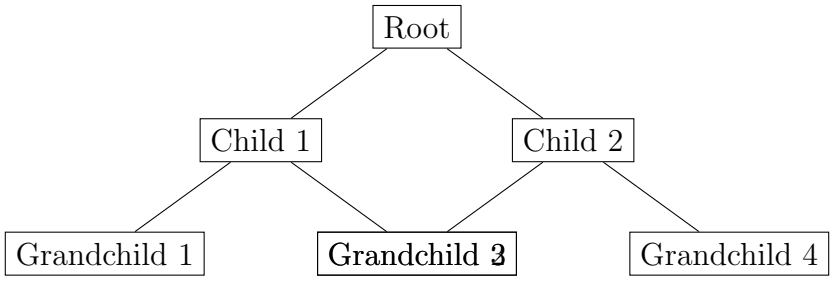
Result: Factorial of n
Initialize result $\leftarrow$ 1;
for $i \leftarrow 2$ **to** n **do**
  result $\leftarrow$ result $\times$ i;
end
return *result*

Algorithm 1: Factorial Calculation

Chapter 10

TikZ Diagrams

10.1 Sample Tree Diagram



Chapter 11

Conclusion

This report offered a hands-on overview of LaTeX. By breaking down individual features across separate chapters, readers gain a modular understanding of its components. Students are encouraged to experiment and expand each section, developing custom commands and styles as needed.

The power of LaTeX lies in its automation, scalability, and precision—making it a valuable tool for students, researchers, and authors.

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