OSS Lab Report
Prof.Pranav Nerurkar
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ASSIGNMENT NO. 1

1.What are the advantages of LaTex in Word Processing Tools?

- **Dealing with mathematical notation :** Layout and entry are generally easier using LaTeX than some other sort of equation editor.
- **Consistent handling of intra-document references and bibliography.** As of a couple of years ago the major WYSIWYG editors still had problems with re-numbering cross-references and bibliography items. This is never a problem with BibTeX or LaTeX.
- **Separation of content and style.** In principle this means that you can write your document without caring how it is formatted, and at the end of the day wrap it in the style-file provided by the journal publisher before submission to conform to the house style. In practice some of the journal publishers demand special formatting commands that partially moots this process. Furthermore recent versions of Word and LibreOffice Writer, when properly used, should be able to keep track of various levels of section heading separate from the body text, and apply uniform styling to each level. The gap is somewhat closing.
- **Portability.** LaTeX portability comes in multiple ways: An actual LaTeX file is merely a text file, which is just about the most portable format in computing. The LaTeX system that processes the text file and produces the finished document has been implemented on just about every mainstream platform you care to mention. The default output file format for LaTeX is DVI (which stands for device independent). This was around well before PDF was dreamed up and the high quality files can be viewed via software viewers or printed out. DVI is an open standard, so once again, readers are extremely portable and exist on most operating systems. Admittedly, DVI is hardly ubiquitous and nowadays it's often bypassed in favour for PDF (or it's very simple to convert to other formats like PS or HTML)
- **Lightweight** in terms of computational resources for typing.
- **Bibliography styles:** changing the style allows to switch back and forth between e.g. references with title and linked doi and the journal's requested format without.

2.LaTex Commands

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Command List		
Sr.No.	Commands	Description
1	$\backslash begin\{itemize\}$	Defines an environment of non-ordered items.
2	$\backslash item$	Item part of a list.
3	$\backslash documentclass$	Creates a Document in Latex.
4	$\backslash usepackage/comment/$	Enables the use of multi-line comments ($\backslash ifx\backslash fi$).
5	$\backslash usepackage/fullpage/$	Changes the margin.
6	$\backslash backslash$	Prints a backslash.
7	$\backslash section$	Marks the beginning of a new section.
8	$\backslash hline$	Horizontal Line.
9	$\backslash noindent$	The next paragraph is not indented.
10	$\backslash newline$	Starts a new line without actually starting a new paragraph.

Table 1: CMD_Table

3.Version Control In Overleaf

One can use the Save & Restore feature to save versions of the work in Overleaf.The previous versions can be restored from *history*.
These versions save the complete document (source code, attached files and PDF), and one can save up to 300 versions.
We can access this feature via the 'Versions' link in the editor's top bar—simply name a version and hit enter to save the current version of your work.

4.Collaborations With Overleaf

One can share the projects *or can also collab with others with the help of* LaTex Overleaf.
Anyone can edit this project :

https://www.overleaf.com/7293876213rvcjqhptnhhv
Anyone can view this project:

https://www.overleaf.com/read/rmyvfykzknmw

5.Tables In LaTex

Tables are common elements in most scientific documents, LaTeX provides a large set of tools to customize tables, change the size, combine cells, change the colour of cells and so on.The tabular environment is the default LaTeX method to create tables. You must specify a parameter to this environment, c c c tells LaTeX that there will be three columns and that the text inside each one of them must be centred.

Creating a Table : $\backslash arrayrulecolor HTML${**DB5800**}
$\backslash begin\{table\}h!$
$\backslash centering$
$\backslash captionExample$
$\backslash labeltab : my_label$
$\backslash begin\{center\}$
$\backslash begin\{tabular\}\{|c|c|c|\}$
$\backslash hline$
$\backslash cellcolor\{pink\}cell1\&cell2\&cell3$
$\backslash hline$
$cell4\&\backslash cellcolor\{red\}cell5\&cell6$
$\backslash hline$
$cell7\&cell8\&\backslash cellcolor\{green\}cell9$
$\backslash hline$
$\backslash \{tabular\}$
$\backslash end\{center\}$
$\backslash end\{table\}$

Example of a simple table :

Table 2: Example

cell1	cell2	cell3
cell4	cell5	cell6
cell7	cell8	cell9

6.Equations

The feature that makes LATEX the right editing tool for scientific documents is the ability to render complex mathematical expressions.

1. **Equation :**

$$x^n + y^n = z^n$$

2. **Symbol:** $\mathbf{e}^{\pi i} + 1 = 0 Large Brackets : \left\{ \begin{array}{ccc} \mathbf{1} & \mathbf{5} & \mathbf{8} \\ \mathbf{0} & \mathbf{2} & \mathbf{4} \\ \mathbf{3} & \mathbf{3} & \mathbf{-8} \end{array} \right\}$

3. **Limits:**

$$\int_0^1 x^2 + y^2 \ dx$$

Subscript and Superscript:

$$m_1^2 + m_2^2 = m_3^2$$

Operators using Symbol,subscript and superscript :

$$\sum_{i=1}^{\infty} \frac{1}{n^s} = \prod_p \frac{1}{1 - p^{-s}}$$

Trignometric Functions :

$$\sin(a + b) = \sin(a)\cos(b) + \cos(a)\sin(b)$$

Set : {x: x $\in a, b\}$

Binomial :

$$\binom{n}{k} = \frac{n!}{k!(n-k)!}$$

Greek Letters : αA**,** βB**,** $\gamma\Gamma$**,** $\theta\Theta$

7.Images In LaTex

Images are essential elements in most of the scientific documents. LATEX provides several options to handle images and make them look exactly what you need. 1

Figure 1: Nature

Figure 2: Beach

8.List Of Tables And Figures

List of Figures

1 Nature . . . . . .
2 Beach . . . . . .

List of Tables

1 CMD_Table 2
2 Example 3
3 Symbols_ And_Notations . . . . . .

9.Glossary In LaTex

Latex mathematics

10.Bibliography

Whole Bibliography

[1] Paul Adrien Maurice Dirac. *The Principles of Quantum Mechanics*. International series of monographs on physics. Clarendon Press, 1981. ISBN: 9780198520115.

[2] Albert Einstein. "Zur Elektrodynamik bewegter Körper. (German) [On the electrodynamics of moving bodies]". In: *Annalen der Physik* 322.10 (1905), pp. 891–921. DOI: http://dx.doi.org/10.1002/andp.19053221004.

11.Symbols And Notations

Symbols	Notations
A,α	$\backslash Alpha, \backslash alpha$
B,β	$\backslash Beta, \backslash beta$
Δ, δ	$\backslash Delta, \backslash delta$
π	$\backslash pi$
Θ, θ	$\backslash Theta, \backslash theta$

Table 3: Symbols_ And_Notations