Software Systems Lab: OutLab 5

$\LaTeX$(80 marks)

Code Warriors

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Contents

This is a LaTeX document for the course **Software Systems Lab** with course code *CS 251.* You need to replicate the document. Spacing need not be matched perfectly but page numbers should be. **1 mark is for the title page.**. Bonus marks will be given only if you score full (80/80) in the rest.

1 Introduction (4 marks)

LaTeX is a word processor and document markup language. It is distinguished from typical word processors such as Microsoft Word and Apple Pages in that the writer uses plain text as opposed to formatted text, relying on markup tagging conventions to define the general structure of a document (such as article, book, and letter), to stylise text throughout a document (such as **bold** and *italic*), and to add citations and cross-referencing. A TeX distribution such as **TeXLive** or **MikTeX** is used to produce an output file (such as PDF or DVI) suitable for printing or digital distribution.

LaTeX is used for the communication and publication of scientific documents in many fields, including mathematics, physics, computer science, statistics, economics, and political science. It also has a prominent role in the preparation and publication of books and articles that contain complex multilingual materials, such as Sanskrit and Arabic. LaTeX uses the TeX typesetting program for formatting its output, and is itself written in the TeX macro language.

LaTeX is widely used in academia. LaTeX can be used as a standalone document preparation system, or as an intermediate format. In the latter role, for example, it is often used as part of a pipeline for translating DocBook and other XML-based formats to PDF. The typesetting system offers programmable desktop publishing features and extensive facilities for automating most aspects of typesetting and desktop publishing, including numbering and cross-referencing of tables and figures, chapter and section headings, the inclusion of graphics, page layout, indexing and bibliographies.

Below are some of the basic packages which youll be using. For other required packages, search over the net :).

1.1 graphicx package

This package is used to import tables, and figure in the document. Our document type is article, and we are currently using a4 type paper with the following margin geometry: (total=6in, 8in, margin=1.2in, bottom=1in), which is specified in the beginning.

1.2 amssymb package

This package is used to import mathematical symbols in the document. We encapsulate the mathematical equations and symbols under $, and they are changed to maths symbols.

2   Pointers (3 + 2 + 1 marks)

Here we are using **itemize** to generate unordered list.

- LATEXtypesets a file of text using the TEX program.

- LATEXis widely used in academia for the communication and publication of scientific documents in many fields, including mathematics, physics, computer science, statistics, economics and political science.

- LATEXcan be used as a standalone document preparation system or as an intermediate format.

- **We have used renewcommand for the bullets to be bigger.**

- Look at the **item separation space**, and **change it** accordingly.

For ordered lists we use **enumerate**.

I. LATEXtypesets a file of text using the TEX program.

II. LATEXis widely used in academia for the communication and publication of scientific documents in many fields, including mathematics, physics, computer science, statistics, economics and political science.

III. LATEXcan be used as a standalone document preparation system or as an intermediate format.

IV. LATEXis intended to provide a high-level language that accesses the power of TeX in an easier way for writers.

(a) LATEXtypesets a file of text using the TEX program.

(b) LATEXis widely used in academia for the communication and publication of scientific documents in many fields, including mathematics, physics, computer science, statistics, economics and political science.

Following is another type of a pointer (**description**).

CS 213 Data structures and Algorithm

CS 215 Data Analysis and Interpretation

CS 251 Software Systems Lab

3 Mathematical formulae and notations (15 marks)

3.1 Equation Array (4 marks)

$$
\begin{aligned}
\cos^3\theta + \sin^3\theta &= (\cos\theta + \sin\theta)(\cos 2\theta - \cos\theta\sin\theta) & (1)\\
&= (\cos\theta + \sin\theta)(1 - \cos\theta\sin\theta) & (2)\\
&= (\cos\theta + \sin\theta)(1/2)(2 - 2\cos\theta\sin\theta)(3) & (3)\\
&= (1/2)(\cos\theta + \sin\theta)(2 - \sin(2\theta)) & (4)
\end{aligned}
$$

3.2 Prepositional Formulae using Various Operators (2 marks)

$(\exists x)(\phi(x) \wedge \psi(x)) \leftrightarrow ((\exists x)\phi(x) \wedge (\exists x)\psi(x))$

$(\exists x)(\phi(x) \wedge \psi(x)) \rightarrow ((\exists x)\phi(x) \wedge (\exists x)\phi(x) \wedge (\exists x)\psi(x))$

3.3 Alphabets (3 marks + 1 mark for table)

Binary Operators:	$\times \otimes \oplus \cup \cap$
Relation Operators:	$\subset \supset \subseteq \supseteq <>$
Others:	$\int \oint \sum \prod$

3.4 Mathematical Formulas (5 marks)

1. $\displaystyle \int_a^b x^3 dx = \frac{1}{4}x^4 \Big|_a^b$

2. $\displaystyle \frac{\pi}{4} = 4\sum_{n=0}^{\infty} \frac{(-1)^n}{(2n+1)5^{2n+1}} - \sum_{n=0}^{\infty} \frac{(-1)^n}{(2n+1)239^{2n+1}}$

3. $\displaystyle \pi = \frac{3\sqrt{3}}{4} - 24\sum_{n=0}^{\infty} \frac{\frac{(2n)!}{(n)}}{2n+1(2n+1)4^{2n+1}}$

4. $\displaystyle \frac{1}{\pi} = \frac{2\sqrt{2}}{9801} \sum_{n=0}^{\infty} \frac{(4n)!(1103 + 26390n)}{(n)!^4 396^{4n}}$

5. $\displaystyle \sum_{i=0}^{\left\lfloor \frac{n}{2} \right\rfloor} \binom{x_{i,i+1}^{i^2}}{\left\lfloor \frac{i+3}{3} \right\rfloor} \frac{\sqrt{\mu(i)^{\frac{3}{2}}(i^2 - 1)}}{\sqrt[3]{\rho(i) - 2} + \sqrt[3]{\rho(i) - 1}}$

4 Tables (10 marks)

To combine rows a package must be imported with in your preamble, then you can use the XXXXXXX command in your document. The table below includes mathematical notations, which you can produce by embedding the expression in $ $ delimiters. For subscript, use underscore and for superscript, use carrot.

		Basic Properties						Readability		
		WC	SC	C-W	S-W	W-S	FK	GF	SMOG	LEX
Baseline	Mean	0.84	0.41	**0.56**	**0.46**	**0.55**	**0.60**	0.56	0.57	0.63
	SD	0.07	0.08	0.06	0.07	0.05	0.05	0.06	0.07	0.05
ScaComph	Mean	0.89	0.46	0.53	0.43	0.53	0.58	0.54	0.56	0.62
	SD	0.05	0.08	0.05	0.06	0.06	0.05	0.05	0.06	0.05
ScaComph	Mean	**0.92**	**0.48**	0.55	0.45	0.53	0.59	**0.58**	**0.61**	**0.64**
	SD	0.04	0.07	0.05	0.04	0.05	0.04	0.04	0.04	0.04

The first part of **the** methods.

1. First thing

2. Second thing
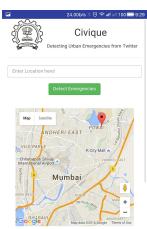
    - A sub-thing
    - Another sub-thing

3. Third thing

4.1 Stage 2

The <u>second</u> part of the ᴍᴇᴛʜᴏᴅs. Item #1A\642 costs $8 & is sold at a 10% profit.

5 Results

Here are my results.Referring to section **??** on page **??**

Item	Quantity	Price (&)
Nails	500	0.34
Wooden boards	100	4.00

Figure 1: my image