

# **Software Systems Lab: Outlab 5**

## **L<sup>A</sup>T<sub>E</sub>X(80 marks)**

Dominatrix

180050005

180050095

18D070026

14 September, 2019

**Contents**

**1 Introduction (4 marks) 2**

1.1 graphicx package . . . . . 2

1.2 amssymb package . . . . . 3

**2 Pointers (3 + 2 + 1 marks) 3**

**3 Mathematical formulae and notations (15 marks) 4**

3.1 Equation Array (4 marks) . . . . . 4

3.2 Prepositional Formulae using Various Operators (2 marks) . . . . . 4

This is a  $\text{\LaTeX}$  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)

$\text{\LaTeX}$  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  $\text{\TeX}$  distribution such as  **$\text{\TeX}$  Live** or **Mik- $\text{\TeX}$**  is used to produce an output file (such as PDF or DVI) suitable for printing or digital distribution.

$\text{\LaTeX}$  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.  $\text{\LaTeX}$  uses the  $\text{\TeX}$  typesetting program for formatting its output, and is itself written in the  $\text{\TeX}$  macro language.

$\text{\LaTeX}$  is widely used in academia.  $\text{\LaTeX}$  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 you'll 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.

- $\text{\LaTeX}$ typesets a file of text using the TEX program.
- $\text{\LaTeX}$ is 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.
- $\text{\LaTeX}$ can 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  $\text{\LaTeX}$ typesets a file of text using the TEX program.
  - II  $\text{\LaTeX}$ is 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  $\text{\LaTeX}$ can be used as a standalone document preparation system or as an intermediate format.
  - IV  $\text{\LaTeX}$ is intended to provide a high-level language that accesses the power of TeX in an easier way for writers.
- (a)  $\text{\LaTeX}$ typesets a file of text using the TEX program.
  - (b)  $\text{\LaTeX}$ is 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

### 3 Mathematical formulae and notations (15 marks)

#### 3.1 Equation Array (4 marks)

$$\cos^3\theta + \sin^3\theta = (\cos\theta + \sin\theta)(\cos^2\theta - \cos\theta\sin\theta) \quad (1)$$

$$= (\cos\theta + \sin\theta)(1 - \cos\theta\sin\theta) \quad (2)$$

$$= (\cos\theta + \sin\theta)(1/2)(2 - 2\cos\theta\sin\theta) \quad (3)$$

$$= (1/3)(\cos\theta + \sin\theta)(2 - \sin 2\theta) \quad (4)$$

#### 3.2 Propositional Formulae using Various Operators (2 marks)

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

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