An Assignment on LaTeX

Aditya Vashishtha

August 21, 2017

Contents

Chapter 1

Tables

1.1 Dummy section

1.1.1 Dummy subsection

Lorem Ipsum is simply [1] dummy text of the printing and typesetting industry. Lorem Ipsum has been the industry's standard dummy text ever since the 1500s, when an unknown printer took a galley of type and scrambled it to make a type specimen book. It has survived not only five centuries, but also the leap into electronic typesetting, remaining essentially unchanged. It was popularised in the 1960s with the release of Letraset sheets containing Lorem Ipsum passages, and more recently with desktop publishing software like Aldus PageMaker including versions of Lorem Ipsum.

1.1.2 Second subsection

Lorem Ipsum is simply [2] dummy text of the printing and typesetting industry. Lorem Ipsum has been the industry's standard dummy text ever since the 1500s, when an unknown printer took a galley of type and scrambled it to make a type specimen book. It has survived not only five centuries, but also the leap into electronic typesetting, remaining essentially unchanged. It was popularised in the 1960s with the release of Letraset sheets containing Lorem Ipsum passages, and more recently with desktop publishing software like Aldus PageMaker including versions of Lorem Ipsum.

[1] This is first footnote.
[2] This is second footnote.

1.2 Second section

1.2.1 Dummy subsection

Lorem Ipsum is simply dummy text of the printing and typesetting industry. Lorem Ipsum has been the industry's standard dummy text ever since the 1500s, when an unknown printer took a galley of type and scrambled it to make a type specimen book. It has survived not only five centuries, but also the leap into electronic typesetting, remaining essentially unchanged. It was popularised in the 1960s with the release of Letraset sheets containing Lorem Ipsum passages, and more recently with desktop publishing software like Aldus PageMaker including versions of Lorem Ipsum.

1.2.2 Second subsection

Lorem Ipsum is simply dummy text of the printing and typesetting industry. Lorem Ipsum has been the industry's standard dummy text ever since the 1500s, when an unknown printer took a galley of type and scrambled it to make a type specimen book. It has survived not only five centuries, but also the leap into electronic typesetting, remaining essentially unchanged. It was popularised in the 1960s with the release of Letraset sheets containing Lorem Ipsum passages, and more recently with desktop publishing software like Aldus PageMaker including versions of Lorem Ipsum.

Chapter 2

Math

2.1 Quadratic

2.1.1 Que.3 Solve the equation $5x^2 - 2x + 1 = 0$.

solution:

$$5x^2 - 2x + 1 = 0 \qquad \text{...given}$$

Using formula :
x_1, x_2 root of equation
$ax^2 + bx + c = 0$ are,

$$x_1, x_2 = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

here for given equation, $a = 5, b = -2, c = 1$
we have,

$$x_1, x_2 = \frac{-(-2) \pm \sqrt{(-2)^2 - 4 * (5) * (1)}}{2 * (5)}$$

$$x_1, x_2 = \frac{2 \pm \sqrt{4 - 20}}{10}$$

$$x_1, x_2 = \frac{2 \pm \sqrt{-16}}{10}$$

$$x_1, x_2 = \frac{2 \pm 4 * \sqrt{-1}}{10}$$

$$\Rightarrow x_1, x_2 = \frac{2 \pm 4i}{10}$$ **Ans**

2.2 Progression

2.2.1 Summation of n^2

$$\sum_{x=1}^{x=n} x^2 = 1^2 + 2^2 + 3^3 + 4^2 ... + (n-1)^2 + n^2$$
$$\sum_{x=1}^{x=n} x^2 = \frac{(n)(n+1)(2n+1)}{6}$$

2.3 Matrix

2.3.1 Multiplication of Matrix

Find X*Y if,

$$X = \begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix}, Y = \begin{bmatrix} 7 & 8 & 9 & 0 \\ 1 & 2 & 3 & 4 \end{bmatrix}$$

$$XY = \begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix} \begin{bmatrix} 7 & 8 & 9 & 0 \\ 1 & 2 & 3 & 4 \end{bmatrix}$$

$$XY = \begin{bmatrix} (1*7+2*1) & (1*8+2*2) & (1*9+2*3) & (1*0+2*4) \\ (3*7+4*1) & (3*8+4*2) & (3*9+4*3) & (3*0+4*4) \\ (5*7+6*1) & (5*8+6*2) & (5*9+6*3) & (5*0+6*4) \end{bmatrix}$$

2.4 Calculas

2.4.1 Integration Problem

Solve the Integration $\int xcos(x^2)dx$.
solution:

$$\begin{aligned} f(x) &= \int x * cos(x^2)dx && \text{(given)} \\ &= \int x * cos(x^2)dx \\ putting, \qquad x^2 &= t && (1) \end{aligned}$$

differenting both the side equation 1,

$$\begin{aligned} x^2dx &= tdx \\ 2x &= t\frac{dt}{dx} \\ \Rightarrow x * dx &= \frac{t}{2}dt && (2) \end{aligned}$$

putting value of equation 2nd in given equation,

$$f(t) = \int cos(t)dt$$

$$f(t) = sin(t) + C \qquad \because \int cos(x)dx = sin(x) + c$$

as[1] putting,

$$t = \sqrt{x}$$

[1] $\because \int cos(x) = sin(x) + c$

from equation 1
we have

$$f(x) = \int xcos(x^2)dx = sin(\sqrt{x}) + C$$
$$f(x) = sin(\sqrt{x}) + C \qquad \text{(Ans)}$$

2.5 Binomial

Write binomial formula for $(a+b)^5$.

$$(a+b)^5 = \binom{5}{0}a^5b^0 + \binom{5}{1}a^4b^1 + \binom{5}{2}a^3b^2 + \binom{5}{3}a^2b^3\binom{5}{4}a^1b^4 + \binom{5}{5}a^0b^5$$

Chapter 3

Algorithm

3.1 Sorting

3.1.1 Bubble sort

Input: list of elements.
Output: Sorted list.
BubbleSort(List)

1: set $n \leftarrow length(list)$
2: **for** $i = 0$ **to** $n - 1$ **do**
3: **for** $j = 0$ **to** $(n - i - 1)$ **do**
4: set $swapped \leftarrow false$
5: **if** $list[j - 1] > list[j]$ **then**
6: $swap(list[j - 1], list[j])$
7: set $swapped \leftarrow true$
8: **end if**
9: **end for**
10: **if** $(swapped == false)$ **then**
11: *break*
12: **end if**
13: **end for**

Chapter 4

References

$$x = y \tag{4.1}$$

First equation 2
First Section 1.1
BubbleSort refered in 3.1.1