## Before doing this worksheet kindly do the following steps:

- Please install R on your device. Visit https://www.r-project.org/ to download R and learn more about it.
- Please Read Section 1.5 of the text.

## The worksheets will not be graded but we shall provide solutions for the same before we announce the next worksheet,

- 1. Find the sum of squares of the first 50 natural numbers.
- 2. Find  $\binom{200}{4}$
- 3. Take the vector x = c(-15, -11, -4, 0, 7, 9, 16, 23)
  . Find the outputs of the functions listed below: sum(x),length(x),mean(x),var(x),sd(x),max(x),min(x),median(x)
- 4. Security guard Shyamala has a log book of the institute bus. In the log book she keeps track of the kilometer reading before each time driver Sakshi fills petrol. The last 8 readings are:

65311, 65624, 65908, 66219, 66499, 66821, 67145, 67447

- (a) Enter these numbers into R as a variable kreading. Use the function diff on the data. What does it give?
  - > kreading = c(65311, 65624, 65908, 66219, 66499, 66821, 67145, 67447)
    > differences = diff(kreading)

Write down, x, the number of kilometers between each time Sakshi fills up petrol.

- (b) Use the max to find the maximum number of kilometers, the mean function to find the average number of kilometers and the min to get the minimum number of kilometers Sakshi has driven between two fill-ups.
- 5. Jaldi Suppandi, a D-block student resident started tracking his commute time for two weeks and finds the following times in minutes

 $7, \quad 6, \quad 10, \quad 8, \quad 7, \quad 9, \quad 15, \quad 6, \quad 4, \quad 10, \quad 8, \quad 6, \quad 9, \quad 10$ 

(a) Enter this into R as a variable Jaldicommutes. Use the function max to find the longest commute time, the function mean to find the average and the function min to find the minimum.

- (b) When confronted by Slowpoke Siva, Jaldi realizes that entry 4 was a mistake. It should have been 14 (as he had to return midway since he forgot his H.W.). How can you fix this? Do so, and then find the new average.
- (c) What does the below command provide in R?

> sum( Jaldicommutes >= 9)

- (d) What do you get? What percent of your commutes are less than 17 minutes? How can you answer this with R?
- 6. Naina's cell phone bill varies from month to month. Suppose in her first year of Super Math (hons.) program, under the Drop-at most 10-calls monthly plan, the following monthly amounts were incurred:

460, 330, 390, 370, 460, 300, 480, 320, 490, 350, 300, 480

- (a) Enter this data into a variable called Nainabill. Use the sum command to find the amount spent by Naina that year on the cell phone.
- (b) Using R find out what is the smallest amount she spent in a month and the largest amount she spent in a month ?
- (c) How many months was the amount greater than Rs 400? What percentage was this?
- (d) If her monthly stipend from PRESPIRE fellowship was Rs 3000. Using R store her balance(after paying her phone bill) in a variable called freemoney. Find the average amount available each month for her other expenses.