R –Day2 Questions

Save the answers of all questions to a Single File named Day2.R

1) Create the vectors:
   (a) (1, 2, 3, . . . , 19, 20, 19, 18, . . . , 2, 1)
   (b) (4, 6, 3) and assign it to the variable x

2) Using rep to create the following vectors.
   (a) (4, 6, 3, 4, 6, 3, . . . , 4, 6, 3) where there are 10 occurrences of 4.
   (b) (4, 6, 3, 4, 6, 3, . . . , 4, 6, 3, 4) where there are 11 occurrences of 4, 10 occurrences of 6 and 10 occurrences of 3.
   (c) (4, 4, . . . , 4, 6, 6, . . . , 6, 3, 3, . . . , 3) where there are 10 occurrences of 4, 20 occurrences of 6 and 30 occurrences of 3.

3) Assume that you are interested in cone-shaped structures, and have measured the height and radius of 6 cones. Make vectors with these values as follows:
   R <- c(2.27, 1.98, 1.69, 1.88, 1.64, 2.14)
   H <- c(8.28, 8.04, 9.06, 8.70, 7.58, 8.34)
   a) Make a vector with the volumes of the 6 cones. (Volume=1/3 pi R^2 H)
   b) Round the values to 2 decimal points and store into a vector
   c) Find out the the minimum and maximum volumes
      (hint: use the functions min and max)

4) Create 3 Vectors A,B & C with the following contents.

   A should contain a Random sample of 250 numbers between 0 and 999.
   (hint: use the command *sample(0:999,250))*

   B should contain all numbers from A which are greater than 900
   (hint:use *which* command & subsetting with index vector)

   C should contain all the elements from B in sorted order.
   (hint:use the function *sort()*)

5) Assume that we have registered the height and weight for four people: Heights in cm are 180, 165, 160, 193; weights in kg are 87, 58, 65, 100. Make two vectors, height and weight, with the data. The body mass index (BMI) is defined as (weight in kg/ (height in m) ^{2}).
   a) Make a vector with the BMI values for the four people.
   b) Also make a vector with the weights for those people who have a BMI > 25.
   c) Find the average BMI Value.

6) Create a vector, marks (out of 50) of 10 students. Compute the following.

   (a) Mean of these marks and store into a variable p1
   (b) Median of these marks and store into a variable p2
   Hint: Use the functions mean and median on the vector.

7) In an experiment the dry weight has been measured for 8 plants grown under certain conditions (the values are given below). Try the following commands in order to make a vector with the values and compute various sample statistics:

```
dry <- c(77, 93, 92, 68, 88, 75, 100)
sum(dry)
length(dry)
mean(dry)
sum(dry)/length(dry)  ## Equation for mean, cross check value with Mean above
sort(dry)
median(dry)
sd(dry)
var(dry)    ##Variance
sd(dry)^2
min(dry)
max(dry)
summary(dry)
```

8) Create a vector **N** of 10 random numbers between 1 & 20. (Use the Sample function with replacement=True). Print the numbers in **N** which are divisible by 2. (hint: Use modulo operator %%.)