612303050 Deshmukh Mehmood Rehan's Assignment 1

Q1.Install packages namely 'plyr', 'MASS', 'ggplot2', 'dplyr' etc.

```
#we can use vector to install multiple packages simultaneously
install.packages(c('plyr', 'MASS', 'ggplot2', 'dplyr'), repos = "http://cran.us.r-project.org")
```

```
## Installing packages into 'C:/Users/deshm/AppData/Local/R/win-library/4.3'
## (as 'lib' is unspecified)
```

```
## package 'plyr' successfully unpacked and MD5 sums checked
## package 'MASS' successfully unpacked and MD5 sums checked
## package 'ggplot2' successfully unpacked and MD5 sums checked
## package 'dplyr' successfully unpacked and MD5 sums checked
##
## The downloaded binary packages are in
##  C:\Users\deshm\AppData\Local\Temp\Rtmpa2a6Gb\downloaded_packages
```

Q2.Find answers to log2(2.5) and log(exp(1)*exp(1))

```
answer1 <- log2(2^5)
answer1
```

```
## [1] 5
```

```
answer2 <- log(exp(1)*exp(1))
answer2
```

```
## [1] 2
```

Q3.Using built-in dataset iris, implement the functions like: Summary, class, type of, head,tail, str, Merge.

```
#loading dataset
data(iris)

#summary
iris_summary <- summary(iris)
iris_summary
```

```
##   Sepal.Length    Sepal.Width     Petal.Length    Petal.Width
##  Min.   :4.300   Min.   :2.000   Min.   :1.000   Min.   :0.100
##  1st Qu.:5.100   1st Qu.:2.800   1st Qu.:1.600   1st Qu.:0.300
##  Median :5.800   Median :3.000   Median :4.350   Median :1.300
##  Mean   :5.843   Mean   :3.057   Mean   :3.758   Mean   :1.199
##  3rd Qu.:6.400   3rd Qu.:3.300   3rd Qu.:5.100   3rd Qu.:1.800
##  Max.   :7.900   Max.   :4.400   Max.   :6.900   Max.   :2.500
##        Species
##  setosa    :50
##  versicolor:50
##  virginica :50
##
##
##
```

```
#class
iris_class <- class(iris)
iris_class
```

```
## [1] "data.frame"
```

```
#typeof
iris_typeof <- typeof(iris)
iris_typeof
```

```
## [1] "list"
```

```
#head
iris_head <- head(iris)
iris_head
```

```
##   Sepal.Length Sepal.Width Petal.Length Petal.Width Species
## 1          5.1         3.5          1.4         0.2  setosa
## 2          4.9         3.0          1.4         0.2  setosa
## 3          4.7         3.2          1.3         0.2  setosa
## 4          4.6         3.1          1.5         0.2  setosa
## 5          5.0         3.6          1.4         0.2  setosa
## 6          5.4         3.9          1.7         0.4  setosa
```

```
#tail
iris_tail <- tail(iris)
iris_tail
```

```
##     Sepal.Length Sepal.Width Petal.Length Petal.Width   Species
## 145          6.7         3.3          5.7         2.5 virginica
## 146          6.7         3.0          5.2         2.3 virginica
## 147          6.3         2.5          5.0         1.9 virginica
## 148          6.5         3.0          5.2         2.0 virginica
## 149          6.2         3.4          5.4         2.3 virginica
## 150          5.9         3.0          5.1         1.8 virginica
```

```
#str
iris_str <- str(iris)
```

```
## 'data.frame':    150 obs. of  5 variables:
##  $ Sepal.Length: num  5.1 4.9 4.7 4.6 5 5.4 4.6 5 4.4 4.9 ...
##  $ Sepal.Width : num  3.5 3 3.2 3.1 3.6 3.9 3.4 3.4 2.9 3.1 ...
##  $ Petal.Length: num  1.4 1.4 1.3 1.5 1.4 1.7 1.4 1.5 1.4 1.5 ...
##  $ Petal.Width : num  0.2 0.2 0.2 0.2 0.2 0.4 0.3 0.2 0.2 0.1 ...
##  $ Species     : Factor w/ 3 levels "setosa","versicolor",..: 1 1 1 1 1 1 1 1 1 1 ...
```

```
#merge
iris_merge <- merge(iris, iris, by = "Petal.Length")
head(iris_merge)
```

```
##   Petal.Length Sepal.Length.x Sepal.Width.x Petal.Width.x Species.x
## 1          1.0           4.6           3.6           0.2    setosa
## 2          1.1           4.3           3.0           0.1    setosa
## 3          1.2           5.8           4.0           0.2    setosa
## 4          1.2           5.8           4.0           0.2    setosa
## 5          1.2           5.0           3.2           0.2    setosa
## 6          1.2           5.0           3.2           0.2    setosa
##   Sepal.Length.y Sepal.Width.y Petal.Width.y Species.y
## 1            4.6           3.6           0.2    setosa
## 2            4.3           3.0           0.1    setosa
## 3            5.8           4.0           0.2    setosa
## 4            5.0           3.2           0.2    setosa
## 5            5.8           4.0           0.2    setosa
## 6            5.0           3.2           0.2    setosa
```

Q4.Write a R program to create a two-dimensional 5×3 array of sequence of even integers greater than

```
answer4 <- array(seq(from = 52, by = 2, length.out = 5*3), dim = c(5, 3))
answer4
```

```
##      [,1] [,2] [,3]
## [1,]   52   62   72
## [2,]   54   64   74
## [3,]   56   66   76
## [4,]   58   68   78
## [5,]   60   70   80
```

Q5. Write a R program to create a vector which contains 10 integer values between -50 and +50

```
answer5 <- seq(-50,50, 10)
answer5
```

```
##  [1] -50 -40 -30 -20 -10   0  10  20  30  40  50
```

Q6.Suppose the age is a vector containing ages of 10 persons as 22,27,31,41,30,25,19,20,23,35

```
age <- c(22, 27, 31, 41, 30, 25, 19, 20, 23, 35)

#a).Access the age of fourth person
answer6a <- age[4]
answer6a
```

```
## [1] 41
```

```
#b).Create a vector of 'age 30' with a person >30
answer6b <- age[age > 30]
answer6b
```

```
## [1] 31 41 35
```

```
#c).Access the age of last 3 person
answer6c <- tail(age, 3)
answer6c
```

```
## [1] 20 23 35
```

```
#d).Find the number of elements in vector age
answer6d <- length(age)
answer6d
```

```
## [1] 10
```

```
#e).Access the age of person except 5th and 7th
answer6e <- age[-c(5, 7)]
answer6e
```

```
## [1] 22 27 31 41 25 20 23 35
```

```
#f).Create a vector 'age 2' with a persons between 20 and 25.
answer6f <- age[(age >= 20) & (age <= 25)]
answer6f
```

```
## [1] 22 25 20 23
```

Q7.Create a factor from the following vector data:(1,2,3,2,3,1,4,2,3,NA,5,3,2) and also find levels

```
answer7_factors <- factor(c(1, 2, 3, 2, 3, 1, 4, 2, 3, NA, 5, 3, 2))
answer7 <- levels(answer7_factors)
answer7
```

```
## [1] "1" "2" "3" "4" "5"
```

Q8.Write a R program to create a list containing strings, numbers, vectors and a logical values.

```
answer8 <- list("abcd", 123, c(1, 2, 3), TRUE)
answer8
```

```
## [[1]]
## [1] "abcd"
##
## [[2]]
## [1] 123
##
## [[3]]
## [1] 1 2 3
##
## [[4]]
## [1] TRUE
```

Q9.Using built-in dataset iris, find out the categorical variables.

```
answer9 <- sapply(iris, is.factor)
answer9
```

```
## Sepal.Length  Sepal.Width Petal.Length  Petal.Width      Species
##        FALSE        FALSE        FALSE        FALSE         TRUE
```

Q10.Create a numeric vector c(1:5) and a 5 by 3 matrix with elements from 1 to 15.

```
answer10_vector <- c(1:5)
answer10_matrix <- matrix(1:15, nrow = 5, ncol = 3)
answer10_vector
```

```
## [1] 1 2 3 4 5
```

```
answer10_matrix
```

```
##      [,1] [,2] [,3]
## [1,]    1    6   11
## [2,]    2    7   12
## [3,]    3    8   13
## [4,]    4    9   14
## [5,]    5   10   15
```

Q11. Create a dataframe of the following dataset height:140,137,150,147,139,140,150,132,138,140 Weight:55,57,59,62,61,60,60,58,59,57

```
answer11_dataframe <- data.frame(
  height = c(140, 137, 150, 147, 139, 140, 150, 132, 138, 140),
  weight = c(55, 57, 59, 62, 61, 60, 60, 58, 59, 57)
)

#a).Create a vector h1 with height>145cms
h1 <- answer11_dataframe$height[answer11_dataframe$height > 145]
h1
```

```
## [1] 150 147 150
```

```
#b).Create a vector h2 with weight>55kgs
h2 <- answer11_dataframe$weight[answer11_dataframe$weight > 55]
h2
```

```
## [1] 57 59 62 61 60 60 58 59 57
```

```
#c).Create a vector h3 with height>140 and weight >60
h3 <- answer11_dataframe$height[answer11_dataframe$height > 140 & answer11_dataframe$weight > 60]
h3
```

```
## [1] 147
```