**3RD ASSESMENT**

**R Programming Assignment: Basic Calculations, Variables, Vectors, and Data Management Instructions**:

1. Write the R code for each question in your R environment and run the code to see the results. 2. Submit both your R code and the output in a document.

**1. Basic Calculations**

a. Perform the following calculations in R:

∙ 1+2

∙ (100+30)/13

∙ 3^4+2^4

∙ (2^2 -1)\*4/3

b. Evaluate the following step-by-step:

∙ 1+2×3

**2. Working with Variables**

a. Assign the result of 1+3 to a variable x and then perform the following operations: ∙ Display the value of x.

∙ Calculate x2

∙ Multiply x by 2.

b. Overwrite the variable x with 2, and create another variable y as 3. Perform the following operations: ∙ Display the values of x and y.

∙ Calculate x+y

∙ Calculate x\*y

∙ Calculate x−y

**3. Vectors and Calculations**

a. Create two vectors x1 and x2 as follows:

x1 <- c(1, 2, 3, 4, 5)

x2 <- c(1, 3, 5, 7, 9)

b. Perform the following operations:

∙ Display the values of x1 and x2.

∙ Add x1 and x2.

∙ Multiply x1 by x2.

c. Calculate the following statistics for x1:

∙ Mean

∙ Standard deviation

∙ Median

∙ Minimum value

∙ Maximum value

∙ Sum of all elements

∙ Range (minimum and maximum)

**5. Directory Management and Data Export/Import**

a. Get the current working directory:

getwd ()

b. Set a new working directory to a folder on your desktop (change the path if necessary): setwd ("")

**6. Saving and Reading Data**

a. Use the built-in iris dataset and perform the following:

∙ Display the iris dataset using View ().

∙ Save the dataset as a CSV file:

write.csv (iris, "irisdata.csv", row. names = FALSE)

b. Read the saved CSV file and perform the following:

∙ Load the dataset:

irisdata <- read.csv("irisdata.csv")

∙ Display the first six rows and the last six rows of the dataset.

∙ Check the structure of the dataset using nrow(), ncol(), and dim().

**7. Summary Statistics and Data Manipulation**

a. Obtain summary statistics for the irisdata dataset:

b. Add a new column ratio\_sepal to the dataset, which is the ratio of Sepal.Length to Sepal.Width. View the first six rows:

**8. Exercise: Ratio Calculation**

a. Add a new column ratio\_petal, which is the ratio of Petal.Length to Petal.Width. View the first six rows.

**9. Species-Specific Analysis**

a. Calculate the mean and standard deviation of Sepal.Length for each species in the dataset: b. Extract data for species setosa and obtain a summary of this subset:

**Submission**:

∙ Upload your R script and the results of each section.

∙ Be prepared to discuss the logic behind your calculations in the next class.

**ANSWERS OF 3RD ASSESMENT**

| | #BASIC CALCULATIONS  > 1+2  [1] 3  > (100+30)/13  [1] 10  > 3^4+2^4  [1] 97  > (2^2-1)\*4/3  [1] 4  > 1+2\*3  [1] 7  > #WORKING WITH VARIABLES  > X<-1+3  > X  [1] 4  > X^2  [1] 16  > X\*2  [1] 8  > X<-2  > Y<-3  > X  [1] 2  > Y  [1] 3  > X+Y  [1] 5  > X\*Y  [1] 6  > X-Y  [1] -1  > #VECTORS AND CALCULATIONS  > X1<-c(1,2,3,4,5)  > X2<-c(1,3,5,7,9)  > X1  [1] 1 2 3 4 5  > X2  [1] 1 3 5 7 9  > X1+X2  [1] 2 5 8 11 14  > X1\*X2  [1] 1 6 15 28 45  > mean(X1)  [1] 3  > sd(X1)  [1] 1.581139  > median(X1)  [1] 3  > min(X1)  [1] 1  > max(X1)  [1] 5  > sum(X1)  [1] 15  > range(X1)  [1] 1 5  > #DIRECTORY MANAGEMENT AND DATA EXPORT/IMPORT  > getwd()  [1] "C:/Users/User/Desktop/3rd Assesment"  > setwd("C:\\Users\\User\\Desktop\\3rd Assesment")  > #SAVING AND READING DATA  > View(iris)  > write.csv(iris,"iris.csv",row.names = F)  > iris<-read.csv("iris.csv")  > head(iris)  Sepal.Length Sepal.Width Petal.Length Petal.Width Species ratio\_sepal  1 5.1 3.5 1.4 0.2 setosa 7.00  2 4.9 3.0 1.4 0.2 setosa 7.00  3 4.7 3.2 1.3 0.2 setosa 6.50  4 4.6 3.1 1.5 0.2 setosa 7.50  5 5.0 3.6 1.4 0.2 setosa 7.00  6 5.4 3.9 1.7 0.4 setosa 4.25  > tail(iris)  Sepal.Length Sepal.Width Petal.Length Petal.Width Species ratio\_sepal  145 6.7 3.3 5.7 2.5 virginica 2.280000  146 6.7 3.0 5.2 2.3 virginica 2.260870  147 6.3 2.5 5.0 1.9 virginica 2.631579  148 6.5 3.0 5.2 2.0 virginica 2.600000  149 6.2 3.4 5.4 2.3 virginica 2.347826  150 5.9 3.0 5.1 1.8 virginica 2.833333  > nrow(iris)  [1] 150  > ncol(iris)  [1] 6  > dim(iris)  [1] 150 6  > #SUMMARY STATISTICS AND DATA MANIPULATIONS  > summary(iris)  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 ratio\_sepal  Length:150 Min. : 2.125  Class :character 1st Qu.: 2.802  Mode :character Median : 3.300  Mean : 4.311  3rd Qu.: 4.667  Max. :15.000  > iris$ratio\_sepal<-iris$Petal.Length/iris$Petal.Width  > head(iris)  Sepal.Length Sepal.Width Petal.Length Petal.Width Species ratio\_sepal  1 5.1 3.5 1.4 0.2 setosa 7.00  2 4.9 3.0 1.4 0.2 setosa 7.00  3 4.7 3.2 1.3 0.2 setosa 6.50  4 4.6 3.1 1.5 0.2 setosa 7.50  5 5.0 3.6 1.4 0.2 setosa 7.00  6 5.4 3.9 1.7 0.4 setosa 4.25  > #SPECIES SPECIFIC ANALYSIS  > tapply(iris$Sepal.Length,iris$Species,mean)  setosa versicolor virginica  5.006 5.936 6.588  > Setosadata<-subset(iris,iris$Species=="setosa")  > summary(Setosadata)  Sepal.Length Sepal.Width Petal.Length Petal.Width  Min. :4.300 Min. :2.300 Min. :1.000 Min. :0.100  1st Qu.:4.800 1st Qu.:3.200 1st Qu.:1.400 1st Qu.:0.200  Median :5.000 Median :3.400 Median :1.500 Median :0.200  Mean :5.006 Mean :3.428 Mean :1.462 Mean :0.246  3rd Qu.:5.200 3rd Qu.:3.675 3rd Qu.:1.575 3rd Qu.:0.300  Max. :5.800 Max. :4.400 Max. :1.900 Max. :0.600  Species ratio\_sepal  Length:50 Min. : 2.667  Class :character 1st Qu.: 4.688  Mode :character Median : 7.000  Mean : 6.908  3rd Qu.: 7.500  Max. :15.000 | | --- | |  | |  | |
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