**R Lab**

**E.x:8 Creation of Piechart**

**Aim:** To plot the vector as Pie chart using R language

**Procedure**

Step1) Install R and R Studio IDE in the System

Step2) Create a new script file using the command File🡪New File🡪R Script or

Ctrl +Shift+N.

Step3) Create vector and plot it as Pie chart using functions.

Step4) Save this file using File🡪Save or Ctrl+S

Step5) Select ALL and run the script file using Ctrl+Enter

Step6) Close the R Script file.

**Program coding**

**x<-c(10,20,30,40)**

**chart1<-pie(x,init.angle=90)**

**print(chart1)**

**mylabel<-c("Toyota","Benz","Maruti","Audi")**

**chart2<-pie(x,label=mylabel,main="Cars")**

**print(chart2)**

**colors<-c("red","blue","green","yellow")**

**chart3<-pie(x,label=mylabel,col=colors)**

**legend("bottomright",mylabel,fill=colors)**

**print(chart3)**

**Result :**

Thus Vector has been plotted as Pie chart using R programming language successfully

**Ex.9 Importing and Analyzing mtcars dataset**

**Aim:** To import mtcars dataset and perform various operations using R language

**Procedure**

Step1) Install R and R Studio IDE in the System

Step2) Create a new script file using the command File🡪New File🡪R Script or Ctrl +Shift+N.

Step3) Install ggplot2 package and load mtcars dataset .

Step4) Perform various descriptive statistical operations using functions.

Step5) Save this file using File🡪Save or Ctrl+S

Step5) Select ALL and run the script file using Ctrl+Enter

Step6) Close the R Script file.

**Program coding**

**install.packages("ggplot2")**

**library("ggplot2")**

**data(mtcars)**

**mtcars**

#To summarize each variable in dataset

**summary(mtcars)**

#Structure of dataset

**str(mtcars)**

#dimensions in terms of number of rows and columns

**dim(mtcars)**

#get all quartiles of mpg variable

**res<-quantile(mtcars$mpg)**

**print(res)**

#get maximum mpg

**print(max(mtcars$mpg))**

#count number of observations

**print(nrow(mtcars))**

#count number of variables

**print(ncol(mtcars))**

#first 6 observations

**head(mtcars)**

#last 6 observations

**tail(mtcars)**

#cars with cylinder>6 and mpg>15.5

**data<-subset(mtcars,cyl>6 & mpg>15.5)**

**print(data)**

**write.csv(data,"P:\\mtcarsdata.csv",row.names=TRUE)**

**print(“The observations with cylinder greater than 6 and mileage greater than 15.5 is”)**

**read.csv("P:\\mtcarsdata.csv")**

**Result :**

Thus mtcars dataset has been loaded and analysed using R language successfully

**Ex.10 Analyzing and Visualizing mtcars dataset**

**Aim:** To import mtcars dataset and plot the values in histogram using R language

**Procedure**

Step1) Install R and R Studio IDE in the System

Step2) Create a new script file using the command File🡪New File🡪R Script or Ctrl +Shift+N.

Step3) Install ggplot2 package and load mtcars dataset .

Step4) Perform various descriptive statistical operations using functions.

Step5) Plot the variable values in histogram

Step6) Save this file using File🡪Save or Ctrl+S

Step7) Select ALL and run the script file using Ctrl+Enter

Step8) Close the R Script file.

**Program coding**

**install.packages("ggplot2")**

**library("ggplot2")**

**data(mtcars)**

**mtcars**

#To summarize each variable in dataset

**summary(mtcars)**

#Structure of dataset

**str(mtcars)**

#dimensions in terms of number of rows and columns

**dim(mtcars)**

#get all quartiles of mpg variable

**res<-quantile(mtcars$mpg)**

**print(res)**

#get maximum mpg

**print(max(mtcars$mpg))**

#count number of observations

**print(nrow(mtcars))**

#count number of variables

**print(ncol(mtcars))**

#first 6 observations

**head(mtcars)**

#last 6 observations

**tail(mtcars)**

**#create histogram of mpg values**

**hist(mtcars$mpg,**

**col=”steelblue”,**

**main=”Histogram of Mileage vaues”,**

**xlab=”mpg”,**

**ylab=”Frequency”)**

**write.csv(data,"P:\\mtcarsdata.csv",row.names=TRUE)**

**print(“The observations with cylinder greater than 6 and mileage greater than 15.5 is”)**

**read.csv("P:\\mtcarsdata.csv")**

**Result :**

Thus mtcars dataset has been loaded, analysed and visualized in histogram using R language successfully

**Ex.12 Importing and Analyzing IRIS dataset**

**Aim:** To import IRIS dataset and perform various operations using R language

**Procedure**

Step1) Install R and R Studio IDE in the System

Step2) Create a new script file using the command File🡪New File🡪R Script or Ctrl +Shift+N.

Step3) Install ggplot2 package and load IRIS dataset .

Step4) Perform various descriptive statistical operations using functions.

Step5) Save this file using File🡪Save or Ctrl+S

Step5) Select ALL and run the script file using Ctrl+Enter

Step6) Close the R Script file.

**Program coding**

**#install.packages("ggplot2")**

**#library("ggplot2")**

**data(iris)**

**iris**

**summary(iris)**

**str(iris)**

**print(nrow(iris))**

**#count number of variables**

**print(ncol(iris))**

**#first 6 observations**

**head(iris)**

**#last 6 observations**

**tail(iris)**

**#extract only setosa species**

**res<-subset(iris,Species=="setosa")**

**print(res)**

**#extract only sepal length and find sum,mean,median,min and max values**

**mysepal = iris$Sepal.Length**

**sum(mysepal)**

**mean(mysepal)**

**median(mysepal)**

**min(mysepal)**

**max(mysepal)**

**attach(iris)**

**plot(Sepal.Length, Sepal.Width)**

**plot(Sepal.Length, Sepal.Width, ylim=c(0,5), xlim=c(3,9))**

**Result :**

Thus IRIS dataset has been loaded and various operations performed using R language successfully

**Ex.11 Performing Statistical testing t-test and Correlation on two sample variables of mtcars dataset**

**Aim:** To perform students t-test and finding correlation between two sample variables using R language

**Procedure**

Step1) Install R and R Studio IDE in the System

Step2) Create a new script file using the command File🡪New File🡪R Script or Ctrl +Shift+N.

Step3) Install ggplot2 package and load mtcars dataset .

Step4) Perform statistical t-test and finding correlation using functions.

Step5) Plot the result in boxplot.

Step6) Save this file using File🡪Save or Ctrl+S

Step7) Select ALL and run the script file using Ctrl+Enter

Step8) Close the R Script file.

**Program coding**

# View the first few rows of the dataset

**head(mtcars)**

# Separate the data into two groups (e.g., automatic vs. manual transmission)

**group\_auto <- mtcars$mpg[mtcars$am==0]**

**group\_manual <- mtcars$mpg[mtcars$am==1]**

# Perform a two-sample t-test

**result <- t.test(group\_auto, group\_manual)**

# Print the result

**print(result)**

#finding correlation between mileage per gallon and weight

**cor.test(mtcars$mpg,mtcars$wt)**

**means <- c(mean(group\_auto), mean(group\_manual))**

**names <- c("Automatic", "Manual")**

# Create a boxplot

**boxplot(group\_auto, group\_manual,**

**names = c("Automatic", "Manual"),**

**main = "Miles per Gallon (mpg) by Transmission Type",**

**ylab = "Miles per Gallon (mpg)")**

**Result :**

Thus mtcars dataset has been loaded and performed statistical t-test ,correlation using R language successfully