**Roll No:-04**

**Assignment No:- 6**

**Assignment Name : Write Program to implement the following analysis technique using R.**

**1)Stastical hypothesis testing:-**

#One-sample T-testing:

x<-rnorm(100)#sample vector

t.test(x,mu=5)#one-sample t-test

#two-sample T-testing:

x<-rnorm(100)

y<-rnorm(100)

t.test(x,y)

#Directional Hypothesis:-

t.test(x,mu=2,alternative = 'greater')

#one sample u-test:-

wilcox.test(y,exact = FALSE)

#Two sample u-test:-

wilcox.test(x,y)

**2)Correlation Test:-**

cor.test(matcars$mpg,matcars$hp)

**3)Chi-Square Test:-**

library(MASS)

#create DataFrame:

print(str(survey))

# Create a data frame from the main data set.

stu\_data = data.frame(survey$Smoke,survey$Exer)

# Create a contingency table with the needed variables.

stu\_data = table(survey$Smoke,survey$Exer)

print(stu\_data)

**OUTPUT:-**

#1)Stastical hypothesis testing:-

> #One-sample T-testing:

> x<-rnorm(100)#sample vector

> t.test(x,mu=5)#one-sample t-test

One Sample t-test

data: x

t = -52.314, df = 99, p-value < 2.2e-16

alternative hypothesis: true mean is not equal to 5

95 percent confidence interval:

-0.2298852 0.1523448

sample estimates:

mean of x

-0.03877023

> #two-sample T-testing:

> x<-rnorm(100)

> y<-rnorm(100)

> t.test(x,y)

Welch Two Sample t-test

data: x and y

t = -0.062003, df = 197.96, p-value = 0.9506

alternative hypothesis: true difference in means is not equal to 0

95 percent confidence interval:

-0.2842159 0.2668885

sample estimates:

mean of x mean of y

0.04941380 0.05807748

> #Directional Hypothesis:-

> t.test(x,mu=2,alternative = 'greater')

One Sample t-test

data: x

t = -19.884, df = 99, p-value = 1

alternative hypothesis: true mean is greater than 2

95 percent confidence interval:

-0.1134708 Inf

sample estimates:

mean of x

0.0494138

> #one sample u-test:-

> wilcox.test(y,exact = FALSE)

Wilcoxon signed rank test with continuity correction

data: y

V = 2589, p-value = 0.8272

alternative hypothesis: true location is not equal to 0

> #Two sample u-test:-

> wilcox.test(x,y)

Wilcoxon rank sum test with continuity correction

data: x and y

W = 5039, p-value = 0.9251

alternative hypothesis: true location shift is not equal to 0

> #2)Correlation Test:-

> cor.test(mtcars$mpg,mtcars$hp)

Pearson's product-moment correlation

data: mtcars$mpg and mtcars$hp

t = -6.7424, df = 30, p-value = 1.788e-07

alternative hypothesis: true correlation is not equal to 0

95 percent confidence interval:

-0.8852686 -0.5860994

sample estimates:

cor

-0.7761684

> #3)Chi-Square Test:-

> library(MASS)

> #create DataFrame:

> print(str(survey))

'data.frame': 237 obs. of 12 variables:

$ Sex : Factor w/ 2 levels "Female","Male": 1 2 2 2 2 1 2 1 2 2 ...

$ Wr.Hnd: num 18.5 19.5 18 18.8 20 18 17.7 17 20 18.5 ...

$ NW.Hnd: num 18 20.5 13.3 18.9 20 17.7 17.7 17.3 19.5 18.5 ...

$ W.Hnd : Factor w/ 2 levels "Left","Right": 2 1 2 2 2 2 2 2 2 2 ...

$ Fold : Factor w/ 3 levels "L on R","Neither",..: 3 3 1 3 2 1 1 3 3 3 ...

$ Pulse : int 92 104 87 NA 35 64 83 74 72 90 ...

$ Clap : Factor w/ 3 levels "Left","Neither",..: 1 1 2 2 3 3 3 3 3 3 ...

$ Exer : Factor w/ 3 levels "Freq","None",..: 3 2 2 2 3 3 1 1 3 3 ...

$ Smoke : Factor w/ 4 levels "Heavy","Never",..: 2 4 3 2 2 2 2 2 2 2 ...

$ Height: num 173 178 NA 160 165 ...

$ M.I : Factor w/ 2 levels "Imperial","Metric": 2 1 NA 2 2 1 1 2 2 2 ...

$ Age : num 18.2 17.6 16.9 20.3 23.7 ...

NULL

> # Create a data frame from the main data set.

> stu\_data = data.frame(survey$Smoke,survey$Exer)

>

> # Create a contingency table with the needed variables.

> stu\_data = table(survey$Smoke,survey$Exer)

>

> print(stu\_data)

Freq None Some

Heavy 7 1 3

Never 87 18 84

Occas 12 3 4

Regul 9 1 7