18-09-2018 **Assignment Number 8 1740256**

**Hypothesis Testing**

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**Aim:** *A certain stimulus administered to each of the 13 patients resulted in the following increase of blood pressure:*

*5, 2, 8, -1, 3, 0, -2, 1, 5, 0, 4, 6, 8.*

*Can it be concluded that the stimulus, in general, be accompanied by an increase in the blood pressure?*

**Procedure:**

> x<-c(5,2,8,-1,3,0,-2,1,5,0,4,6,8)

> t.test(x,alternative="greater",mu=0)

One Sample t-test

data: x

t = 3.2613, df = 12, p-value = 0.003406

alternative hypothesis: true mean is greater than 0

95 percent confidence interval:

1.360534 Inf

sample estimates:

mean of x

3

> qt(0.05,12)

[1] -1.782288

**Conclusion:**

The p value which is **0.003406** is greater than the critical value **-1.782288.**

Therefore, we accept the null hypothesis at 5% level of significance.

Hence it can be concluded that the stimulus in general cannot be accompanied by an increase in blood pressure.

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**Aim:**

Here we test for a difference in means for the following data

Drug(x1) 237 289 257 228 303 275 262 304 244 233

Drug(x2) 194 240 230 186 265 222 242 281 240 212

**Procedure:**

> y1<-c(237,289,257,228,303,275,262,304,244,233)

> y2<-c(194,240,230,186,265,222,242,281,240,212)

> t.test(y1,y2,var.equal=FALSE,paired=FALSE)

Welch Two Sample t-test

data: y1 and y2

t = 2.4725, df = 17.982, p-value = 0.02363

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

95 percent confidence interval:

4.807367 59.192633

sample estimates:

mean of x mean of y

263.2 231.2

> qt(0.05,17.982)

[1] -1.734158

**Conclusion:**

In this question – the p value **0.02363** is greater than the critical value -**1.734158.**

Therefore, we accept the null hypothesis at 5% level of significance.

Hence there is no significant difference between the means for the data.

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**Aim:**

*An IQ test was administrated to 5 persons before and after they were trained. The results are given below*

*Candidates I II III IV V*

*IQ before Training 110 120 123 132 125*

*IQ After Training 120 118 125 136 121*

*Test whether there is any change in IQ after the training Programme*

**Procedure:**

> before<-c(110,120,123,132,125)

> after<-c(120,118,125,136,121)

> t.test(before,after,paired=TRUE)

Paired t-test

data: before and after

t = -0.8165, df = 4, p-value = 0.4601

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

95 percent confidence interval:

-8.800874 4.800874

sample estimates:

mean of the differences

-2

> qt(0.05,4)

[1] -2.131847

**Conclusion:**

In this question – the p value **0.4601** is greater than the critical value –-**2.131847.**

Therefore, we accept the null hypothesis at 5% level of significance.

Hence there is no change in IQ after the training programme.

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**Aim:**

*In order to compare the effectiveness of two sources of nitrogen, namely ammonium chloride and urea on grain yield of paddy, an experiment was conducted. The results on the grain yield of paddy(kg/plot) under the two treatments are given below*

*Ammonium*

*Chloride 13.4 10.9 11.2 11.8 14.0 15.3 14.2 12.6 17.0 16.2 16.5 15.7*

*Urea 12.0 11.7 10.7 11.2 14.8 14.4 13.9 13.7 16.9 16.0 15.6 16.0*

*Asses which sources nitrogen is better for paddy.*

**Procedure:**

> amm<-c(13.4,10.9,11.2,11.8,14.0,15.3,14.2,12.6,17.0,16.2,16.5,15.7)

> urea<-c(12.0,11.7,10.7,11.2,14.8,14.4,13.9,13.7,16.9,16.0,15.6,16.0)

> var.test(amm,urea)

F test to compare two variances

data: amm and urea

F = 1.0309, num df = 11, denom df = 11, p-value = 0.9606

alternative hypothesis: true ratio of variances is not equal to 1

95 percent confidence interval:

0.2967779 3.5810956

sample estimates:

ratio of variances

1.030917

>qt(0.05,11)

[1] -1.795885

**Conclusion:**

In this question – the p value **0.906** is greater than the critical value –-**-1.795885.**

Therefore, we accept the null hypothesis at 5% level of significance.

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