**1) Hypothesis Testing Exercise**

A F&B manager wants to determine whether there is any significant difference in the diameter of the cutlet between two units. A randomly selected sample of cutlets was collected from both units and measured? Analyze the data and draw inferences at 5% significance level. Please state the assumptions and tests that you carried out to check validity of the assumptions.

Minitab File : **Cutlets.mtw**

**Ans: here the given data is in y continues and x is discrete**

cutlets\_jinka<-read.csv(file.choose()) **# loading the data frame**

here first we should do the business problem :

**H0**: there is a significance difference in the diameter of the two cutlets

**H1:** there is no significance difference in the diameter of the two culters

attach(cutlets\_jinka)# attach the 2 variables

shapiro.test(cutlets\_jinka$Unit.A) **# checking whether data is normally distributed or not in a single category**

**H0: data is normal**

**H1: data is not normal # here the data is normal we should go for variance test**

shapiro.test(cutlets\_jinka$Unit.B)

var.test(Unit.A,Unit.B) **# checking variance between the two variables**

**H0: variance is there between the two variables**

**H1: variance is not there between the two variables**

**here the two given variables variance is there so then we should consider the 2 sample t-test**

t.test(Unit.A,Unit.B,alternative = "two.sided",conf.level = 0.95,correct=TRUE)  **# 2 sample t test with the given data**

**here the data is equl so we should consider whether the data is lesser than equal or great the sample t.test**

t.test(Unit.A,Unit.B,alternative = "less",conf.level = 0.95,correct=TRUE**) # for checking whether data is less or greater**

**conditions : P-high null fly and p-low null go**

**the given condition is greater than the so here hypothesis is**

**The condition is we have put alternative is less so we should consider the alternative hypothesis as a less . so here the results are obtained greater p-value so high so null will accept.**

**H0: Greater than**

**H1: less than equal**

**Here we should consider the H0; there is a significance difference in the two diameter of cutlets.**

**2) A hospital wants to determine whether there is any difference in the average Turn Around Time (TAT) of reports of the laboratories on their preferred list. They collected a random sample and recorded TAT for reports of 4 laboratories. TAT is defined as sample collected to report dispatch.**

**Analyze the data and determine whether there is any difference in average TAT among the different laboratories at 5% significance level.**

**Minitab File: LabTAT.mtw**

**Ans) here the given data set in y continues and 4 categories**

**#hypothesis testing concern to the one way annova ( y continioes and 4 categories)**

TAT<-read.csv(file.choose()) **# for loading the data set**

View(TAT) **# for viewing the data set which we extracted**

**here first we should do the business problem :**

**H0: there is a difference in the average turn around time(TAT) of the laboratories**

**H1: there is no difference in the average turn around time(TAT) of the laboratories**

attach(TAT)  **# attach the data set for better understanding the data set**

**# for checking the normalization of given data set for each variable( it fallows the normalization)**

shapiro.test(TAT$Laboratory.1)

shapiro.test(TAT$Laboratory.2)

shapiro.test(TAT$Laboratory.3)

shapiro.test(TAT$Laboratory.4)

**H0: data is normal**

**H1: data is not normal**

**Here the given data is normally so here we can apply the annova test**

**# for checking the variance of given data set(the given data set is equal variance)**

var.test(Laboratory.1,Laboratory.2)

var.test(Laboratory.1,Laboratory.3)

var.test(Laboratory.1,Laboratory.4)

var.test(Laboratory.2,Laboratory.3)

var.test(Laboratory.2,Laboratory.4)

var.test(Laboratory.3,Laboratory.4)

stack\_TAT<- stack(TAT)  **# stack the data for better understanding the given data set**

attach(stack\_TAT) **# attach the data which ever you stacked**

anova\_tat<- aov(values~ind, data = stack\_TAT) **# apply the annova test**

summary(anova\_tat) **# view the summary of the annova**

**Here the p value is high so we are accepting the H0**

**3) Sales of products in four different regions is tabulated for males and females. Find if male-female buyer rations are similar across regions.**

**Ans:-**

buyers\_ratio<- read.csv(file.choose()) **# loading the data set**

View(buyers\_ratio) **# view the data set which ever you have loeaded**

attach(buyers\_ratio)  **# attach the data set for better understading**

stack\_buyers<-stack(buyers\_ratio)  **# stack data set for better improvement for data set**

shapiro.test(stack\_buyers$values) **# use the normality test for checking weather data is normal or not**

**H0: data is normal**

**H1: data is not normal**

**here the data is not normal so here we are using the mood’s median test**

mood**.**medtest**(**stack**\_**buyers**$**values**) # moods median test here I got results as p-high null fly**

**4) TeleCall uses 4 centers around the globe to process customer order forms. They audit a certain % of the customer order forms. Any error in order form renders it defective and has to be reworked before processing. The manager wants to check whether the defective % varies by centre. Please analyze the data at *5%* significance level and help the manager draw appropriate inferences.**

**Minitab File: CustomerOrderForm.mtw**

**Ans:-**

customer\_order<-read.csv(file.choose())  **# loeading the data set**

View(customer\_order)  **#view the data set which ever is load**

attach(customer\_order)  **# attach the data set**

table(customer\_order) **# get the table form the data set**

chisq.test(Phillippines~Indonesia~Malta~India, correct = TRUE)) **# using the chi squire test for 4 catogory**

?chisq.test

**5) Fantaloons Sales managers commented that *%* of males versus females walking in to the store differ based on day of the week. Analyze the data and determine whether there is evidence at *5 %* significance level to support this hypothesis.**

**Minitab File: Fantaloons.mtw**

**Ans:-**

fantloons\_2<-read.csv(file.choose())  **# loeading the data set**

View(fantloons\_2) **# view the data set which ever you loeaded**

attach(fantloons\_2) **#attach the data set for better understanding the model**

table2<- table(Weekdays,Weekend) **#make a table for weekdays and weelends**

table2  **# for view the table**

**#p.test for getting final results**

prop.test(x=c(66,47),n=c(167,66),conf.level =0.95,correct = FALSE,alternative = "less")

**here H0 is greater than the alternative hypothesis for given condition alternative is less so the p-value is less so p-low alternative go. Here are accepting the null hypothesis which is males are greater than the females.**