1. 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**

Solution :- B.P = Difference in the diameter of the cutlet between two unit.

Null hypo :- have no difference in the diameter.

Alt. Hypo :-have difference in the diameter.

Using R.

cutlet <-read.csv('/home/sushil/Documents/Assingment/hypo-ass3/Cutlets.csv')

cutlet

install.packages("")

library(readxl)

View(cutlet)

attach(cutlet)

colnames(cutlet)

####### Normality Test##########

shapiro.test(Unit.A) # p-value = 0.32

shapiro.test(Unit.B) # p-value = 0.5225

######### Variance Test #######

var.test(Unit.A,Unit.B) # p-value = 0.3136

######### 2 Sample T Test ######

t.test(Unit.A,Unit.B,alternative = "two.sided",conf.level = 0.95,correct = TRUE) # p-value = 0.4723

########## After seeing the result there is no difference between cutlet of two unit #########

So.accept null hypothesis.

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**

##### Solution :- B.P = To determine whether there is any

##### difference in the average Turn Around Time

##### Null Hypo = No difference in the average turn around time.

##### Alt. Hypo = Average TAT is not same for atleast one laboratory.

Using R.

lab<-read.csv("/home/sushil/Documents/Assingment/hypo-ass3/LabTAT.csv")

lab

View(lab)

attach(lab)

######### Normality Test #########

shapiro.test(Laboratory.1) # p-value = 0.5508

shapiro.test(Laboratory.2) # p-value = 0.8637

shapiro.test(Laboratory.3) # p-value = 0.4205

shapiro.test(Laboratory.4) # p-value = 0.6619

stacked\_data <-stack(lab)

View(stacked\_data)

attach(stacked\_data)

Anova\_result <- aov(values~ind , data = stacked\_data)

summary(Anova\_result) # p-value = <2e-16 \*\*\*

########## Average TAT is not same for atleast one laboratory ##############

So,reject null hypothesis.

3

**Hypothesis Testing Exercise**

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



All proportions are equal

Not all Proportions are equal

Buyer Ratio.mtw

Using R.

buyer<-read.csv('/home/sushil/Documents/Assingment/hypo-ass3/BuyerRatio.csv')

buyer

View(buyer)

attach(buyer)

stacked <- stack(lapply(buyer,as.integer))

stacked

attach(stacked)

View(stacked)

table(values,ind)

t<-prop.table(table(ind))

t

t6<-table(values)

t6

chisq.test(table(values,ind)) # p-value = 0.297

########## All proportion are equal ###########

So,accept null hypothesis.

4 . (a) 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**

##### Solution :- B.P = % of defective order form is same or different.

Null hypo = The proportion of defective entries across the centers are same.

Alt. Hypo = The proportion of defective order form is not same atleast for one center.

Using R.

customerform<-read.csv('/home/sushil/Documents/Assingment/hypo-ass3/Costomer+OrderForm.csv')

customerform

View(customerform)

stacked <- stack(lapply(customerform,as.character))

stacked

View(stacked)

attach(stacked)

table(values,ind)

t1<-prop.table(table(ind))

t1

t2<-table(values)

t2

chisq.test(table(values,ind)) # p-value = 0.2771

################ The proportion of defective entries across the centers are same ##############

(b) 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**

**Solution :- Null hypo = Both males and females came all days.**

**Alt.hypo = Both males and females donot come atleast one day in week.**

**Using R.**

**fantaloon<-read.csv('/home/sushil/Documents/Assingment/hypo-ass3/Faltoons.csv')**

**fantaloon**

**View(fantaloon)**

**attach(fantaloon)**

**stacked<-stack(lapply(fantaloon,as.character))**

**stacked**

**View(stacked)**

**attach(stacked)**

**table(values,ind)**

**t7<-prop.table(table(ind))**

**t7**

**t8<-table(values)**

**t8**

**chisq.test(table(values,ind)) # p-value = 8.543e-05**

**##########Both males and females came all days ##############**