LIVE PROJECTS IN BUSINESS ANALYTICS USING R

Edited and Co-authored by

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Live Projects- Business Analytics Using R

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Study in Local Transport in Mumbai

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Introduction:

Public transport in Mumbai involves the transport of millions of its citizens by train and road. As of 2015, 52% of commuters use public transport. Mumbai has the largest organized bus transport network among major Indian cities. Mumbai's public transport consists primarily of rapid transit on exclusive suburban railway lines augmented by commuter rail on main lines serving outlying suburbs, the bus services of the three municipalities making up the metropolitan area, public taxis and auto rickshaws, as well as ferry services.

We have conducted a short study on local transport in Mumbai. Few of the aspects that we have focused are – Factors considered for travel, most affordable and convenient mode of commute, travel during pandemic, type of fuel used etc.

Methodology:

For the purpose of this study, our method is qualitative data which we have taken through questionnaire. We have received 200 responses by this questionnaire, for which we have done hypothesis testing through R programming to find out the relation between several aspects of our study.

Hypothesis testing:

We have conducted the hypothesis testing, to find out the answers for the following questions:

1. Does income affect preferred mode of travel?

2. Does profession affect preferred mode of travel?

3. Does age group affect preferred mode of travel?

4. Does income affect choice of fuel?

5. Does age group affect factor considered for travelling?

6. Is there a difference in preferred mode of travel for people with income 30k to 50k?

7. Does income of people between 30k to 50k affect choice of fuel?

The complete hypothesis testing and its output is done as follows:

```
getwd()
setwd("C:/Users/Inspiron/Documents/R")
install.packages("csvread")
a=read.csv("Public_Transport_in_Mumbai_Excel_File.csv")
View(a)

#gender converted to factor
Sex=as.factor(c("Male","Female"))
Sex
s=factor(Sex)
s

#age
AgeGrp = as.factor(c("30-49","Below 30","49-59","60 and Above"))
AgeGrp
ag=factor(AgeGrp)
ag

#Profession
Profession= as.factor(c("Student","Other","Businessman","IT Sector"))
Profession
p=factor(Profession)
p

#Travel factor
f=as.factor(c("Time","Distance","Cost","Accessibility"))
f
fc=factor(f)
fc

#Fuel
fuel=as.factor(c("Petrol","CNG","Electricity","Diesel"))
fuel
ff=factor(fuel)
ff


# 1. Does income affect preferred mode of travel?
```

#null hypo: income does not affect preferred mode of travel
#Alternate hypo : income affect preferred mode of travel
anv1<-
aov(a$Monthly.Income..yours.family.~a$Which.mode.do.you.prefer.most.to.travel)
summary(anv1)

Output:

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
a$Which.mode.do.you.prefer.most.to.travel		965e+09	988287737	2.898	0.0362 *
Residuals	199	6.787e+10	341079258		

Signif. codes: 0 ?***? 0.001 ?**? 0.01 ?*? 0.05 ?.? 0.1 ? ? 1

Interpretation:
#p-value <0.05 so we accept alternate hypo and conclude that
#income affect preferred mode of travel
****
2. Does profession affect preferred mode of travel?
#null hypo: profession does not affect preferred mode of travel
#alternate hypo:profession affect preferred mode of travel
chisq.test(a$Profession,a$Which.mode.do.you.prefer.most.to.travel)

#Output :

#Pearson's Chi-squared test

data: a$Profession and a$Which.mode.do.you.prefer.most.to.travel
X-squared = 20.266, df = 9, p-value = 0.01634

Interpretation:
#p-value <0.05 so we accept alternate hypo and conclude that
#profession affect preferred mode of travel

****
3. Does age group affect preferred mode of travel?
#null hypo: ge group does not affect preferred mode of travel
#alternate hypo : age group affect preferred mode of travel
chisq.test(a$AgeGrp,a$Which.mode.do.you.prefer.most.to.travel)

#Output :
#Pearson's Chi-squared test

data: a$AgeGrp and a$Which.mode.do.you.prefer.most.to.travel
X-squared = 19.315, df = 9, p-value = 0.02264

#Interpretation:
#p-value <0.05 so we accept alternate hypo and conclude that
#Age group affect preferred mode of travel

```
*********************************************************************
# 4. Does income affect choice of fuel?
#null hypo:income does not affect choice of fuel
#alternate hypo: income affect choice of fuel
anv1<- aov(a$Monthly.Income..yours.family~a$Which.one.do.you.prefer.most.)
summary(anv1)

#Output:
                                   Df   Sum Sq   Mean Sq F value Pr(>F)
a$Which.one.do.you.prefer.most.   3 3.883e+08 129435625   0.366  0.778
Residuals                 199 7.045e+10 354026777

#Interpretation:
#p-value>0.05 we accept null hypo and conclude that
#income does not affect choice of fuel

*********************************************************************
# 5. Does age grp affect factor considered for traveling?
#null hypo: age grp does not affect factor considered for traveling
#alternate hypo:age grp affect factor considered for traveling
chisq.test(a$AgeGrp,a$The.factor.considered.for.travelling)

#Output:
#Pearson's Chi-squared test

data:  a$AgeGrp and a$The.factor.considered.for.travelling
X-squared = 17.144, df = 9, p-value = 0.04651

Interpretation:
#p-value <0.05 so we accept alternate hypo and conclude that
#Age group affect factor considered for traveling

*********************************************************************
getwd()
setwd("C:/Users/Inspiron/Documents/R")
mt=read.csv("MumbaiTransport.csv")
View(mt)

#gender converted to factor
S=as.factor(c("Male","Female"))
S
gd=factor(S)
gd


# 6. Is there a difference in preferred mode of travel for people with income 30k to 50k?
#Null hypo: there is no difference in preferred mode of travel for people with income
30k to 50k
```

#alternate hypo :there is a difference in preferred mode of travel for people with income 30k to 50k
chisq.test(mtSex,mtWhich.mode.do.you.prefer.most.to.travel)

#Output :
#Pearson's Chi-squared test

data: mt$Sex and mt$Which.mode.do.you.prefer.most.to.travel
X-squared = 0.3614, df = 3, p-value = 0.9481

#Interpretation:
#p-value>0.05 we accept null hypo and conclude that
#there is no difference in preferred mode of travel for people with income 30k to 50k

****
7. Does income of people between 30k to 50k affect choice of fuel?
#null hypo:income of people between 30k to 50k does not affect choice of fuel
#alternate hypo:income of people between 30k to 50k affect choice of fuel
chisq.test(mtSex,mtWhich.one.do.you.prefer.most.)

#Output:
#Pearson's Chi-squared test

data: mt$Sex and mt$Which.one.do.you.prefer.most.
X-squared = 1.5831, df = 3, p-value = 0.6632

#Interpretation:
#p-value>0.05 we accept null hypo and conclude that

#income of people between 30k to 50k does not affect choice of fuel

R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

Conclusion
To conclude, there are several aspects that effect the mode of travel in Mumbai. According to our views, most people, irrespective of their gender, age, profession face some or the other issue while travelling and their choices also vary.

Livelihood of Indian Households before and During Lock-down due to Covid19 Pandemic

Submitted By-
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Benedict

Introduction -

This pandemic has a greater impact on the livelihood of Indian households. We decided to do a study on them by collecting nominal data with respective to the lockdown status (i. e prior to lockdown & during lockdown). We have analyzed this data to find the relationship between them and how far it is affecting the livelihood of the people.

```r
setwd("D:/Trim 4/R")
getwd()

## [1] "D:/Trim 4/R"

corona<-read.csv("Master Data.csv")
View(corona)

# Does gender have an effect on work place preference ?
# Ho: Gender does not affect work place preference.
# H1: Gender affects work place preference
chisq.test(corona$Gender,corona$X.Do.you.prefer.Working.from.home.rather.t
han.going.to.the.workplace...)

## Warning in chisq.test(corona$Gender,
##
corona$X.Do.you.prefer.Working.from.home.rather.than.going.to.the.workplac
e...):
## Chi-squared approximation may be incorrect
```

```
##
##  Pearson's Chi-squared test
##
## data:  corona$Gender and
corona$X.Do.you.prefer.Working.from.home.rather.than.going.to.the.workplac
e...
## X-squared = 12.157, df = 4, p-value = 0.01622
```

```
# Since p-value is 0.01622, Ho is not accepted.
# Conclusion: Gender affects work place preference
```

```
# Does Stability of income depends on the source?
# Ho: Stability of income does not depend on the source.
# H1: Stability of income depends on the source.
sta=aov(corona$Difference.in.the.Income ~corona$Major.Source.of.Income)
summary(sta)
```

```
##                                Df    Sum Sq   Mean Sq F value Pr(>F)
## corona$Major.Source.of.Income   1 1.622e+10 1.622e+10    6.71 0.0104 *
## Residuals                     175 4.230e+11 2.417e+09
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
# since p value is 0.0104, Ho is not accepted.
# Conclusion: Stability of income depends on the source.
```

```
# Does Stability of income depends on the region?
# Ho: Stability of income does not depend on the region.
# H1: Stability of income depends on the region.
sta=aov(corona$Difference.in.the.Income ~corona$Region)
summary(sta)
```

```
##                  Df    Sum Sq   Mean Sq F value Pr(>F)
## corona$Region     1 8.069e+09 8.069e+09   3.276  0.072 .
## Residuals       175 4.311e+11 2.463e+09
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
# since p value is 0.072, Ho is accepted.
# Conclusion: Stability of income does not depend on the region.
```

```
# Does gender has an effect on people who own's an oTT account?
# Ho: Gender does not has an effect on people who own's an oTT account.
# H1: Gender has an effect on people who own's an oTT account.
chisq.test(corona$Gender,corona$OTT.Status)
```

```
##
##  Pearson's Chi-squared test
##
## data:  corona$Gender and corona$OTT.Status
## X-squared = 4.4875, df = 2, p-value = 0.1061
```

```
# since p value is 0.1061, Ho is accepted.
# Conclusion: Gender does not has an effect on people who own's an oTT
account.


# Does gender has an effect on who relies on public transport?
# Ho: Gender does not has an effect on who relies on public transport.
# H1: Gender has an effect on who relies on public transport.
chisq.test(corona$Gender,corona$X.Are.you.dependent.on.Public.Transport.Of
fice.Buses.for.commute...)

##
##  Pearson's Chi-squared test
##
## data:  corona$Gender and
corona$X.Are.you.dependent.on.Public.Transport.Office.Buses.for.commute...
## X-squared = 3.3065, df = 4, p-value = 0.5079

# since p value is 0.5079, Ho is accepted.
# Conclusion: Gender does not has an effect on who relies on public
transport.


# Does gender has an effect on people who are in fear of losing jobs?
# Ho: Gender does not has an effect on people who are in fear of losing
jobs.
# H1: Gender has an effect on people who are in fear of losing jobs.
chisq.test(corona$Gender,corona$X.Do.you.fear.losing.your.job.in.this.pand
emic...)

##
##  Pearson's Chi-squared test
##
## data:  corona$Gender and
corona$X.Do.you.fear.losing.your.job.in.this.pandemic...
## X-squared = 4.9017, df = 4, p-value = 0.2975

# since p value is 0.2975, Ho is accepted.
# Conclusion: Gender does not has an effect on people who are in fear of
losing jobs.


# Does region  has an effect on people who are in fear of losing jobs?
# Ho: Region does not has an effect on people who are in fear of losing
jobs.
# H1: Region has an effect on people who are in fear of losing jobs.
chisq.test(corona$Region,corona$X.Do.you.fear.losing.your.job.in.this.pand
emic...)

## Warning in chisq.test(corona$Region,
## corona$X.Do.you.fear.losing.your.job.in.this.pandemic...): Chi-squared
## approximation may be incorrect
```

```
##
##  Pearson's Chi-squared test
##
## data:  corona$Region and
corona$X.Do.you.fear.losing.your.job.in.this.pandemic...
## X-squared = 12.981, df = 8, p-value = 0.1125
```

```
# since p value is 0.1125, Ho is accepted.
# Conclusion: Region does not has an effect on people who are in fear of
losing jobs.
```

```
# Does region has an effect on the tendecy of people who store groceries?
# Ho: Region does not has an effect on the tendecy of people who store
groceries.
# H1: Region has an effect on the tendecy of people who store groceries.
chisq.test(corona$Region,corona$X.Do.you.think.that.there.is.a.need.to.sto
ck.up.groceries...)
```

```
## Warning in chisq.test(corona$Region,
## corona$X.Do.you.think.that.there.is.a.need.to.stock.up.groceries...):
Chi-
## squared approximation may be incorrect
```

```
##
##  Pearson's Chi-squared test
##
## data:  corona$Region and
corona$X.Do.you.think.that.there.is.a.need.to.stock.up.groceries...
## X-squared = 3.6868, df = 8, p-value = 0.8842
```

```
# since p value is 0.8842, Ho is accepted.
# Conclusion: Region does not has an effect on the tendecy of people who
store groceries.
```

```
# Does region  has an effect on people who own's an oTT account?
# Ho: Region does not has an effect on people who own's an oTT account.
# H1: Region has an effect on people who own's an oTT account.
chisq.test(corona$Region,corona$OTT.Status)
```

```
## Warning in chisq.test(corona$Region, corona$OTT.Status): Chi-squared
## approximation may be incorrect
```

```
##
##  Pearson's Chi-squared test
##
## data:  corona$Region and corona$OTT.Status
## X-squared = 3.6058, df = 4, p-value = 0.462
```

```
# since p value is 0.462, Ho is accepted.
# Conclusion: Region does not has an effect on people who own's an oTT
account.
```

```
# Does age has an effect on people who are in fear of losing jobs?
# Ho: Age does not has an effect on people who are in fear of losing jobs.
# H1: Age has an effect on people who are in fear of losing jobs.
chisq.test(corona$Age,corona$X.Do.you.fear.losing.your.job.in.this.pandemi
c...)

## Warning in chisq.test(corona$Age,
## corona$X.Do.you.fear.losing.your.job.in.this.pandemic...): Chi-squared
## approximation may be incorrect

##
##  Pearson's Chi-squared test
##
## data:  corona$Age and
corona$X.Do.you.fear.losing.your.job.in.this.pandemic...
## X-squared = 14.354, df = 20, p-value = 0.8121

# since p value is 0.8121, Ho is accepted.
# Conclusion: Age does not has an effect on people who are in fear of
losing jobs.


# Does the family size has an effect on mental health?
# Ho: Family size does not has an effect on mental health.
# H1: Family size has an effect on mental health.
sta=aov(corona$Number.of.people.in.your.house.
~corona$X.Do.you.agree.that.Mental.Health.of.the.people.has.improved.in.th
is.lock.down.period...)
summary(sta)

##
Df
##
corona$X.Do.you.agree.that.Mental.Health.of.the.people.has.improved.in.thi
s.lock.down.period...   1
## Residuals
175
##
Sum Sq
##
corona$X.Do.you.agree.that.Mental.Health.of.the.people.has.improved.in.thi
s.lock.down.period...   3.92
## Residuals
262.62
##
Mean Sq
##
corona$X.Do.you.agree.that.Mental.Health.of.the.people.has.improved.in.thi
s.lock.down.period...   3.919
## Residuals
1.501
##
F value
##
```

```
corona$X.Do.you.agree.that.Mental.Health.of.the.people.has.improved.in.thi
s.lock.down.period...    2.611
## Residuals
##
Pr(>F)
##
corona$X.Do.you.agree.that.Mental.Health.of.the.people.has.improved.in.thi
s.lock.down.period...   0.108
## Residuals

# since p value is 0.108, Ho is accepted.
# Conclusion: Family size does not has an effect on mental health.


# Does region have an effect on work place preference?
# Ho: Region does not affect work place preference.
# H1: Region affects work place preference
chisq.test(corona$Region,corona$X.Do.you.prefer.Working.from.home.rather.t
han.going.to.the.workplace...)

## Warning in chisq.test(corona$Region,
##
corona$X.Do.you.prefer.Working.from.home.rather.than.going.to.the.workplac
e...):
## Chi-squared approximation may be incorrect

##
##   Pearson's Chi-squared test
##
## data:  corona$Region and
corona$X.Do.you.prefer.Working.from.home.rather.than.going.to.the.workplac
e...
## X-squared = 3.9286, df = 8, p-value = 0.8635

# Since p-value is 0.8635, Ho is accepted.
# Conclusion: Region does not affect work place preference.


# Does region has an effect on number of people who prefer to work from
home?
# Ho: Region does not has an effect on number of people who prefer to work
from home.
# H1: Region has an effect on number of people who prefer to work from
home.
sta=aov(corona$Region
~corona$X.Do.you.prefer.Working.from.home.rather.than.going.to.the.workpla
ce...)
summary(sta)

##
Df
##
corona$X.Do.you.prefer.Working.from.home.rather.than.going.to.the.workplac
e...    1
```

```
## Residuals
175
##
Sum Sq
##
corona$X.Do.you.prefer.Working.from.home.rather.than.going.to.the.workplac
e...    0.59
## Residuals
70.87
##
Mean Sq
##
corona$X.Do.you.prefer.Working.from.home.rather.than.going.to.the.workplac
e...   0.5944
## Residuals
0.4050
##
F value
##
corona$X.Do.you.prefer.Working.from.home.rather.than.going.to.the.workplac
e...    1.468
## Residuals
##
Pr(>F)
##
corona$X.Do.you.prefer.Working.from.home.rather.than.going.to.the.workplac
e...   0.227
## Residuals
```

```
# since p value is 0.227, Ho is accepted.
# Conclusion: Region does not has an effect on number of people who prefer
to work from home.
```

```
table(corona$Gender,corona$Region)
```

```
##
##       0  1  2
##   0   6 40 23
##   1  19 62 27
```

```
#we can see which gender lives in which region
```

```
table(corona$Gender,corona$OTT.Status)
```

```
##
##       0  1  2
##   0  23 12 34
##   1  51 10 47
```

```
#we can see which gender and their respective OTT status
```

```
# Is there a change in the collective income before and during lock-down ?
```

```
# Ho: There is no significant difference in the collective income before
and during the lock-down.
# H1: There is a significant difference in the collective income before
and during the lock-down.
t.test(corona$Total.Income.Before.Lockdown,corona$Total.Income.post.Lockdo
wn, paired = TRUE)

##
##  Paired t-test
##
## data:  corona$Total.Income.Before.Lockdown and
corona$Total.Income.post.Lockdown
## t = 6.9096, df = 176, p-value = 8.562e-11
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  18533.49 33353.51
## sample estimates:
## mean of the differences
##              25943.5

# Since p-value is 8.562e-11, Ho is not accepted.
#Conclusion: There is a significant difference in the collective income
before and during the lock-down.


# Is there a change in the consumption of Electricity before and during
lock-down ?
# Ho: There is no significant difference in the consumption of Electricity
before and during the lock-down.
# H1: There is a significant difference in the consumption of Electricity
before and during the lock-down.
t.test(corona$Total.Consumption.Before.Kwh.,corona$Total.Consumption.Durin
g..Kwh.,paired = TRUE)

##
##  Paired t-test
##
## data:  corona$Total.Consumption.Before.Kwh. and
corona$Total.Consumption.During..Kwh.
## t = -1.3956, df = 176, p-value = 0.1646
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  -396.35402   67.98589
## sample estimates:
## mean of the differences
##             -164.1841

# Since p-value is  0.1646, Ho is accepted.
#Conclusion: There is no significant difference in the consumption of
Electricity before and during the lock-down.

# Is there a change in the consumption of AC before and during lock-down ?
# Ho: There is no significant difference in the consumption of AC before
and during the lock-down.
```

```
# H1: There is a significant difference in the consumption of AC before
and during the lock-down.
t.test(corona$Consumption.of.AC.Before.,corona$Consumption.of.AC.After.,pa
ired = TRUE)

##
##  Paired t-test
##
## data:  corona$Consumption.of.AC.Before. and
corona$Consumption.of.AC.After.
## t = 0.62649, df = 176, p-value = 0.5318
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  -43.44043  83.84721
## sample estimates:
## mean of the differences
##              20.20339

# Since p-value is 0.5318, Ho is accepted.
#Conclusion: There is no significant difference in the consumption of AC
before and during the lock-down.

# Is there a change in the usage of Modem/WiFi before and during lock-down
?
# Ho: There is no significant difference in the usage of Modem/WiFi before
and during the lock-down.
# H1: There is a significant difference in the usage of Modem/WiFi before
and during the lock-down.
t.test(corona$Consumption.of.Modem.Before.,corona$Consumption.of.Modem.Dur
ing.,paired = TRUE)

##
##  Paired t-test
##
## data:  corona$Consumption.of.Modem.Before. and
corona$Consumption.of.Modem.During.
## t = -2.2478, df = 176, p-value = 0.02583
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  -2.8838307 -0.1873557
## sample estimates:
## mean of the differences
##              -1.535593

# Since p-value is 0.02583, Ho is not accepted.
# Conclusion: There is a significant difference in the usage of Modem/WiFi
before and during the lock-down.


# Is the change in electricity consumption dependent on the region ?
# Ho: The change in electricity consumption is not dependent on the
region.
# H1: The change in electricity consumption is dependent on the region.
```

```
anv<-aov(corona$Difference.in.Consumption~corona$Region)
summary(anv)

##                    Df    Sum Sq Mean Sq F value Pr(>F)
## corona$Region     1    632194  632194   0.257  0.613
## Residuals       175 430498127 2459989

# Since p-value is 0.613, Ho is accepted.
# Conclusion: The change in electricity consumption is not dependent on
the region.

# Does the stability of Income affect the Mental Health of people ?
# Ho: The stability of Income does not affect the Mental Health of people.
# H1: The stability of Income affects the Mental Health of people.
t.test(corona$Difference.in.the.Income,corona$X.Do.you.agree.that.Mental.H
ealth.of.the.people.has.improved.in.this.lock.down.period...)

##
##   Welch Two Sample t-test
##
## data:  corona$Difference.in.the.Income and
corona$X.Do.you.agree.that.Mental.Health.of.the.people.has.improved.in.thi
s.lock.down.period...
## t = -6.9101, df = 176, p-value = 8.542e-11
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##   -33355.13 -18535.11
## sample estimates:
##      mean of x      mean of y
## -25943.502825       1.615819

# Since p-value is 8.542e-11, Ho is not accepted.
# Conclusion: The stability of Income affects the Mental Health of people.

# Is there a difference in the opinion between Men and Women about the
Petrol Consumption ?
# Ho: There is no significant difference in the opinion between Men and
Women people aged about the Petrol Consumption.
# H1: There is a significant difference in the opinion between Men and
Women about the Petrol Consumption.
chisq.test(corona$Petrol.Consumption,corona$Gender)

##
##   Pearson's Chi-squared test with Yates' continuity correction
##
## data:  corona$Petrol.Consumption and corona$Gender
## X-squared = 0.060987, df = 1, p-value = 0.8049

# Since p-value is 0.8409, Ho is not accepted.
# Conclusion: There is no significant difference in the opinion between
Men and Women people about the Petrol Consumption.

# Do Men from age 15-50 feel that Petrol Consumption has gone up ?
# Ho: Men from age 15-50 do not feel that Petrol Consumption has gone up.
# H1: Men from age 15-50 feel that Petrol Consumption has gone up.
```

```r
aaa<-data.frame(petrol=numeric(0))
for (i in c(1:178)) {
  if(isTRUE(corona$Age[i]>=0 & (corona$Age[i]<=3) &
(corona$Gender[i]==1))) {
    bbb<-data.frame(petrol=corona$Petrol.Consumption[i])
    aaa<-rbind(aaa,bbb)
  }
}
View(aaa)
t.test(aaa$petrol,mu=1)

##
##  One Sample t-test
##
## data:  aaa$petrol
## t = -4.1697, df = 102, p-value = 6.413e-05
## alternative hypothesis: true mean is not equal to 1
## 95 percent confidence interval:
##  0.7850932 0.9236446
## sample estimates:
## mean of x
## 0.8543689

# Since p-value is 6.413e-05, Ho is not accepted.
# Conclusion: Men from age 15-50 feel that Petrol Consumption has gone up.

# Is there a difference in the opinion between Men and Women aged 15-50
about the Petrol Consumption ?
# Ho: There is no significant difference in the opinion between Men and
Women people aged 15-50 about the Petrol Consumption.
# H1: There is a significant difference in the opinion between Men and
Women aged 15-50 about the Petrol Consumption.
aaa<-data.frame(petrol=numeric(0),sex=numeric(0))
for (i in c(1:178)) {
  if(isTRUE(corona$Age[i]>=0 & (corona$Age[i]<=3))) {
    bbb<-
data.frame(petrol=corona$Petrol.Consumption[i],sex=corona$Gender[i])
    aaa<-rbind(aaa,bbb)
  }
}
View(aaa)
chisq.test(aaa$petrol,aaa$sex)

##
##  Pearson's Chi-squared test with Yates' continuity correction
##
## data:  aaa$petrol and aaa$sex
## X-squared = 5.7301e-31, df = 1, p-value = 1

# Since p-value is 1, Ho is accepted.
# Conclusion: There is no significant difference in the opinion between
Men and Women people aged 15-50 about the Petrol Consumption.

# Is there a difference in the opinion between Men and Women about the LPG
```

16

```
Consumption ?
# Ho: There is no significant difference in the opinion between Men and
Women people aged about the LPG Consumption.
# H1: There is a significant difference in the opinion between Men and
Women about the LPG Consumption.
chisq.test(corona$Lpg.Consumption,corona$Gender)

##
##  Pearson's Chi-squared test with Yates' continuity correction
##
## data:  corona$Lpg.Consumption and corona$Gender
## X-squared = 0.0029356, df = 1, p-value = 0.9568

# Since p-value is 0.9658, Ho is accepted.
# Conclusion: There is no significant difference in the opinion between
Men and Women people about the LPG Consumption.


# Does Region influence people's opinion about the LPG consumption?
# Ho: Region does not influence people's opinion about the LPG
consumption.
# H1: Region influences people's opinion about the LPG consumption.
chisq.test(corona$Lpg.Consumption,corona$Region)

##
##  Pearson's Chi-squared test
##
## data:  corona$Lpg.Consumption and corona$Region
## X-squared = 1.3784, df = 2, p-value = 0.502

# Since p-value is 0.502, Ho is accepted.
# Conclusion: Region does not influence people's opinion about the LPG
consumption.


# Does Region influence Mental Health ?
# Ho: Region does not influence Mental Health.
# H1: Region influences Mental Health.
chisq.test(corona$Region,corona$X.Do.you.agree.that.Mental.Health.of.the.p
eople.has.improved.in.this.lock.down.period...)

## Warning in chisq.test(corona$Region,
##
corona$X.Do.you.agree.that.Mental.Health.of.the.people.has.improved.in.thi
s.lock.down.period...):
## Chi-squared approximation may be incorrect

##
##  Pearson's Chi-squared test
##
## data:  corona$Region and
corona$X.Do.you.agree.that.Mental.Health.of.the.people.has.improved.in.thi
s.lock.down.period...
## X-squared = 2.6149, df = 8, p-value = 0.9562

# Since p-value is 0.9562, Ho is accepted.
# Conclusion: Region does not influence Mental Health.
```

17

```
# Is the difference in electricity consumption dependent on number of
people working from home ?
# Ho: There is no correlation between electricity consumption and number
of people working from home.
# H1: There is a non-zero correlation between electricity consumption and
number of people working from home.
cor.test(corona$Difference.in.Consumption,corona$Number.of.ppl.WFH,method=
"pearson")

##
##  Pearson's product-moment correlation
##
## data:  corona$Difference.in.Consumption and corona$Number.of.ppl.WFH
## t = 0.94933, df = 175, p-value = 0.3438
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  -0.07673192  0.21679056
## sample estimates:
##        cor
## 0.07157881

# Since the confidence interval range contains zero, Ho is accepted.
# Conclusion: There is no correlation between electricity consumption and
number of people working from home.


# Is the salary(before lock-down) dependent on number of people living in
the house ?
# Ho: There is no correlation between salary and number of people living.
# H1: There is a non-zero correlation between salary and number of people
living.
cor.test(corona$Number.of.people.in.your.house.,corona$Total.Income.Before
.Lockdown,method = "pearson")

##
##  Pearson's product-moment correlation
##
## data:  corona$Number.of.people.in.your.house. and
corona$Total.Income.Before.Lockdown
## t = 4.3608, df = 175, p-value = 2.207e-05
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  0.1735902 0.4402452
## sample estimates:
##        cor
## 0.3130746

# Since the confidence interval range does not contain zero, Ho is not
accepted.
# Conclusion: There is a positive correlation between salary and number of
people living.

# Does change in expenditure depend on the change in income ?
```

```r
# Ho: Change in expenditure does not depend on the change in income.
# H1: Change in expenditure depends on the change in income.
anv<-
aov(corona$Difference.in.the.Income~corona$X.Do.you.feel.that.the.expendit
ure.has.come.down.post.the.implementation.of.lock.down...)
summary(anv)

##
Df
##
corona$X.Do.you.feel.that.the.expenditure.has.come.down.post.the.implement
ation.of.lock.down...    1
## Residuals
175
##
Sum Sq
##
corona$X.Do.you.feel.that.the.expenditure.has.come.down.post.the.implement
ation.of.lock.down... 9.601e+08
## Residuals
4.382e+11
##
Mean Sq
##
corona$X.Do.you.feel.that.the.expenditure.has.come.down.post.the.implement
ation.of.lock.down... 9.601e+08
## Residuals
2.504e+09
##
F value
##
corona$X.Do.you.feel.that.the.expenditure.has.come.down.post.the.implement
ation.of.lock.down...   0.383
## Residuals
##
Pr(>F)
##
corona$X.Do.you.feel.that.the.expenditure.has.come.down.post.the.implement
ation.of.lock.down...   0.537
## Residuals

# Since p-value is 0.537, Ho is accepted.
# Change in expenditure does not depend on the change in income.

# Does the change in Mobile/Laptop charging time depend on the number of
people working from home ?
# Ho: The change in Mobile/Laptop charging time does not depend on the
number of people working from home.
# Ho: The change in Mobile/Laptop charging time depends on the number of
people working from home.
cor.test(corona$Difference.in.consumption.of.mobile...laptop.charging,coro
na$Number.of.ppl.WFH,method = "pearson")
```

```
##
##  Pearson's product-moment correlation
##
## data:  corona$Difference.in.consumption.of.mobile...laptop.charging and
corona$Number.of.ppl.WFH
## t = 0.43505, df = 175, p-value = 0.6641
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  -0.1151899  0.1794996
## sample estimates:
##        cor
## 0.03286921
```

```
# The 95% Confidence Interval range contains zero, thus we accept Ho.
# Conclusion: There is no correlation between Mobile/Laptop charging time
& number of people working from home.
```

```
# Is the source of income dependent on the region ?
# Ho: The  source of income is not dependent on the region.
# H1: The source of income is dependent on the region.
chisq.test(corona$Major.Source.of.Income,corona$Region)
```

```
##
##  Pearson's Chi-squared test
##
## data:  corona$Major.Source.of.Income and corona$Region
## X-squared = 1.9443, df = 4, p-value = 0.746
```

```
# Since p-value is 0.746, Ho is accepted.
# Conclusion: The  source of income is not dependent on the region.
```

```
# Does the Age affect the Work place preference ?
# Ho: Age does not affect the work place preference.
# H1: Age affects work place preference.
anv<-
aov(corona$Age~corona$X.Do.you.prefer.Working.from.home.rather.than.going.
to.the.workplace...)
summary(anv)
```

```
##
Df
##
corona$X.Do.you.prefer.Working.from.home.rather.than.going.to.the.workplac
e...   1
## Residuals
175
##
Sum Sq
##
corona$X.Do.you.prefer.Working.from.home.rather.than.going.to.the.workplac
e...   0.78
## Residuals
147.27
```

```
##
Mean Sq
##
corona$X.Do.you.prefer.Working.from.home.rather.than.going.to.the.workplac
e...  0.7775
## Residuals
0.8415
##
F value
##
corona$X.Do.you.prefer.Working.from.home.rather.than.going.to.the.workplac
e...   0.924
## Residuals
##
Pr(>F)
##
corona$X.Do.you.prefer.Working.from.home.rather.than.going.to.the.workplac
e...  0.338
## Residuals
```

```
# Since p-value is 0.338, Ho is accepted.
# Conclusion: Age does not affect the work place preference.

# Does Number of people in each house depend on the Region ?
# Ho: Number of people in each house does not depend on the Region.
# H1: Number of people in each house depends on the Region.
anv<-aov(corona$Number.of.people.in.your.house.~corona$Region)
summary(anv)
```

```
##                 Df Sum Sq Mean Sq F value Pr(>F)
## corona$Region    1   0.31  0.3129   0.206  0.651
## Residuals      175 266.23  1.5213

# Since p-value is 0.651, Ho is accepted.
# Conclusion: Number of people in each house does not depend on the
Region.
```

Attributes of Online Shopping from Consumers' Perspective

Submitted By -
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Introduction

In this we want to know how the consumer's buying behaviour affect online shopping of apparels. The apparel buying behaviour of Indian consumers through five dimensions viz. consumer characteristics, reference groups, store attributes, promotion and product attributes. The results show that the store attributes promotion and reference groups are the important dimensions of apparel buying behaviour. The demographic aspects namely occupation of the consumer and social class of the consumer has no effect on the consumer buying behaviour in choosing private label brands. The purpose of this **study** is to understand the **consumer perspective** towards **online shopping**, their liking, disliking, and satisfaction level. The objective of this study is know the consumer pattern and to understand the awareness among the consumers regarding the e-commerce platform, to analyse the factors influencing online shopping, to find about the variety of products purchased by the customers through online shopping. In this we have make questionnaire and collect survey from people and analyse their perspective.

```r
library(readr)
a <-read.csv("project1.csv")
```

```r
gender=factor(a$Gender.,levels = c("Male","Female"))
gender
```

```
##   [1] Female Male   Female Female Male   Male   Male   Male   Male   Male
##  [11] Male   Female Male   Female Male   Female Male   Female Male   Male
##  [21] Male   Male   Male   Male   Male   Male   Female Female Male   Femal
e
##  [31] Female Female Female Female Female Female Female Female Male   Femal
e
##  [41] Male   Female Female Male   Male   Female Female Female Female Male
##  [51] Female Male   Female Female Male   Male   Male   Male   Female Femal
e
##  [61] Male   Female Male   Female Male   Female Male   Male   Male   Male
##  [71] Female Female Female Female Female Female Female Male   Female Male
##  [81] Female Female Male   Male   Male   Male   Female Female Male   Femal
e
##  [91] Male   Female Male   Female Male   Male   Male   Male   Female Femal
e
## [101] Female Female Female Male   Female Male   Female Female Male   Male
## [111] Female Male   Male   Male   Female Female Female Male   Female Femal
e
## [121] Male   Female Female Male   Female Female Female Male   Female Male
## [131] Female Female Male   Female Male   Female Female Female Female Male
## [141] Male   Female Male   Male   Female Female Female Male   Male   Femal
e
## [151] Female Male   Male   Male   Male   Male   Female Male   Male   Male
## [161] Male   Female Female Male   Female Female Female Female Male   Male
## [171] Female Female Female Female Female Male   Female Male   Female Femal
e
## [181] Male   Female Female Male   Female Female Female Female Male   Male
## [191] Female Male   Male   Female Female Female Female Male   Female Male
## Levels: Male Female
```

```r
levels(gender)
```

```
## [1] "Male"   "Female"
```

```r
occupation=factor(a$Occupation.,levels = c("Business","Employed","Other","Stu
dent"))
occupation
```

```
##   [1] Student  Student  Student  Other    Student  Student  Student  Stude
nt
##   [9] Student  Student  Student  Student  Student  Student  Student  Stude
nt
##  [17] Student  Student  Student  Student  Student  Student  Student  Stude
nt
##  [25] Student  Student  Student  Student  Student  Student  Student  Stude
nt
##  [33] Student  Student  Student  Student  Employed Employed Student  Busin
ess
```

```
##   [41] Student   Business Business Business Business Business Other    Emplo
yed
##   [49] Student   Employed Employed Business Student  Business Employed Busin
ess
##   [57] Business Employed Employed Other    Employed Employed Business Stude
nt
##   [65] Business Other    Student   Student   Business Business Student   Other
##   [73] Other    Employed Other    Employed Student  Employed Employed Busin
ess
##   [81] Student   Business Employed Business Business Employed Employed Other
##   [89] Employed Employed Business Student   Business Other    Student   Stude
nt
##   [97] Business Business Student   Other    Other    Employed Other    Stude
nt
## [105] Student   Student   Student   Student   Employed Business Student   Busin
ess
## [113] Student   Student   Student   Student   Student   Student   Student   Stude
nt
## [121] Business Student   Student   Business Student   Student   Employed Emplo
yed
## [129] Other    Student   Employed Student   Employed Student   Student   Other
## [137] Other    Other    Student   Business Student   Student   Employed Emplo
yed
## [145] Employed Other    Student   Student   Business Student   Student   Stude
nt
## [153] Student   Student   Employed Business Employed Student   Business Stude
nt
## [161] Employed Student   Student   Student   Business Student   Other    Stude
nt
## [169] Student   Student   Other    Student   Student   Student   Employed Stude
nt
## [177] Employed Employed Other    Student   Student   Student   Student   Stude
nt
## [185] Other    Other    Other    Student   Business Student   Student   Emplo
yed
## [193] Employed Employed Other    Student   Student   Employed Student   Emplo
yed
## Levels: Business Employed Other Student
```

```
levels(occupation)
```

```
## [1] "Business" "Employed" "Other"    "Student"
```

```
frequency1=factor(a$How.frequently.do.you.prefer.online.shopping.,levels = c(
"Occasionally","On the basis of Requirement (When Product is not available in
market)","Routine (Include Window Shopping)"))
levels(frequency1)
```

```
## [1] "Occasionally"
## [2] "On the basis of Requirement (When Product is not available in market)
```

```
"
## [3] "Routine (Include Window Shopping)"

device=factor(a$Which.device.you.use.to.do.online.shopping.,levels = c("Perso
nal Computer (Website)","Smart Phone (Application)"))
levels(device)

## [1] "Personal Computer (Website)" "Smart Phone (Application)"

motivation1=factor(a$The.main.motivation.behind.using.an.E.commerce.Platform.
..Shopping.on.internet.saves.time.,order=TRUE,levels=c("Highly Disagree","Dis
agree","Neutral","Agree","Highly Agree"))
levels(motivation1)

## [1] "Highly Disagree" "Disagree"        "Neutral"         "Agree"
## [5] "Highly Agree"

motivation1

##   [1] Highly Agree    Agree           Highly Agree    Neutral
##   [5] Highly Agree    Highly Agree    Highly Agree    Highly Agree
##   [9] Agree           Agree           Neutral         Neutral
##  [13] Neutral         Neutral         Neutral         Agree
##  [17] Highly Agree    Neutral         Agree           Neutral
##  [21] Agree           Highly Agree    Agree           Highly Agree
##  [25] Agree           Agree           Highly Disagree Neutral
##  [29] Highly Agree    Highly Agree    Highly Agree    Highly Agree
##  [33] Highly Agree    Highly Agree    Highly Agree    Highly Agree
##  [37] Highly Agree    Highly Agree    Highly Agree    Highly Agree
##  [41] Highly Agree    Highly Agree    Highly Agree    Highly Agree
##  [45] Highly Agree    Highly Agree    Highly Agree    Highly Agree
##  [49] Neutral         Agree           Agree           Highly Agree
##  [53] Agree           Agree           Neutral         Agree
##  [57] Neutral         Agree           Agree           Agree
##  [61] Agree           Highly Agree    Agree           Disagree
##  [65] Agree           Neutral         Agree           Agree
##  [69] Neutral         Neutral         Agree           Agree
##  [73] Agree           Agree           Agree           Agree
##  [77] Neutral         Agree           Agree           Highly Agree
##  [81] Agree           Agree           Neutral         Agree
##  [85] Neutral         Agree           Agree           Agree
##  [89] Agree           Highly Agree    Agree           Disagree
##  [93] Agree           Neutral         Agree           Agree
##  [97] Neutral         Neutral         Agree           Agree
## [101] Agree           Agree           Agree           Highly Agree
## [105] Highly Disagree Highly Agree    Highly Agree    Agree
## [109] Highly Agree    Highly Agree    Agree           Highly Agree
## [113] Highly Disagree Highly Agree    Highly Agree    Agree
## [117] Highly Agree    Highly Agree    Neutral         Agree
## [121] Highly Agree    Highly Agree    Highly Agree    Disagree
## [125] Highly Agree    Highly Agree    Neutral         Disagree
```

```
## [129] Neutral          Agree             Neutral          Highly Disagree
## [133] Agree            Neutral           Agree            Agree
## [137] Agree            Agree             Agree            Agree
## [141] Agree            Agree             Highly Agree     Agree
## [145] Highly Agree     Agree             Neutral          Agree
## [149] Agree            Highly Disagree Agree              Highly Agree
## [153] Agree            Agree             Agree            Disagree
## [157] Neutral          Agree             Highly Agree     Agree
## [161] Highly Agree     Agree             Agree            Neutral
## [165] Agree            Agree             Agree            Neutral
## [169] Highly Agree     Agree             Agree            Neutral
## [173] Highly Agree     Highly Agree      Agree            Neutral
## [177] Agree            Agree             Neutral          Agree
## [181] Highly Agree     Agree             Neutral          Agree
## [185] Agree            Agree             Agree            Agree
## [189] Agree            Agree             Agree            Highly Agree
## [193] Agree            Highly Agree      Agree            Neutral
## [197] Highly Disagree Agree              Neutral          Highly Agree
## Levels: Highly Disagree < Disagree < Neutral < Agree < Highly Agree

motivation2=factor(a$The.main.motivation.behind.using.an.E.commerce.Platform.
..It.is.a.great.advantage.to.be.able.to.shop.at.any.time.of.the.day..24.7...,
order=TRUE,levels=c("Highly Disagree","Disagree","Neutral","Agree","Highly Ag
ree"))
motivation2

##   [1] Highly Agree     Agree             Agree            Highly Agree
##   [5] Agree            Agree             Highly Agree     Highly Agree
##   [9] Highly Agree     Highly Agree      Agree            Agree
##  [13] Agree            Neutral           Neutral          Neutral
##  [17] Agree            Agree             Agree            Neutral
##  [21] Agree            Agree             Neutral          Neutral
##  [25] Agree            Neutral           Highly Disagree Agree
##  [29] Neutral          Agree             Neutral          Agree
##  [33] Agree            Agree             Neutral          Agree
##  [37] Neutral          Neutral           Agree            Neutral
##  [41] Agree            Neutral           Agree            Agree
##  [45] Neutral          Neutral           Neutral          Neutral
##  [49] Neutral          Neutral           Agree            Neutral
##  [53] Neutral          Neutral           Agree            Neutral
##  [57] Agree            Disagree          Neutral          Neutral
##  [61] Disagree         Agree             Neutral          Neutral
##  [65] Neutral          Neutral           Disagree         Disagree
##  [69] Agree            Agree             Disagree         Disagree
##  [73] Neutral          Disagree          Disagree         Neutral
##  [77] Neutral          Neutral           Agree            Neutral
##  [81] Neutral          Neutral           Agree            Neutral
##  [85] Agree            Disagree          Neutral          Neutral
##  [89] Disagree         Agree             Neutral          Neutral
##  [93] Neutral          Neutral           Disagree         Disagree
```

```
##   [97] Agree            Agree            Disagree         Disagree
## [101] Neutral           Disagree         Disagree         Neutral
## [105] Highly Disagree Neutral            Neutral          Neutral
## [109] Neutral           Highly Agree     Highly Agree     Highly Agree
## [113] Disagree          Highly Agree     Highly Agree     Neutral
## [117] Highly Agree      Highly Agree     Neutral          Neutral
## [121] Highly Agree      Agree            Agree            Neutral
## [125] Highly Agree      Highly Agree     Agree            Highly Agree
## [129] Neutral           Agree            Agree            Disagree
## [133] Agree             Agree            Agree            Agree
## [137] Agree             Agree            Highly Agree     Agree
## [141] Agree             Agree            Highly Agree     Highly Agree
## [145] Highly Agree      Agree            Neutral          Agree
## [149] Agree             Highly Disagree Agree             Highly Agree
## [153] Agree             Agree            Neutral          Highly Disagree
## [157] Highly Agree      Agree            Highly Agree     Agree
## [161] Highly Agree      Agree            Highly Agree     Agree
## [165] Highly Agree      Agree            Agree            Highly Agree
## [169] Highly Agree      Agree            Agree            Agree
## [173] Highly Agree      Highly Agree     Agree            Agree
## [177] Agree             Agree            Agree            Highly Agree
## [181] Highly Agree      Agree            Agree            Agree
## [185] Agree             Agree            Agree            Highly Agree
## [189] Agree             Agree            Agree            Highly Agree
## [193] Highly Agree      Highly Agree     Agree            Neutral
## [197] Disagree          Agree            Agree            Highly Agree
## Levels: Highly Disagree < Disagree < Neutral < Agree < Highly Agree
```

```r
levels(motivation2)
```

```
## [1] "Highly Disagree" "Disagree"        "Neutral"         "Agree"
## [5] "Highly Agree"
```

```r
motivation3=factor(a$The.main.motivation.behind.using.an.E.commerce.Platform.
..Selection.of.goods.is.very.broad.,order=TRUE,levels=c("Highly Disagree","Di
sagree","Neutral","Agree","Highly Agree"))
motivation3
```

```
##   [1] Highly Agree      Agree            Highly Agree     Neutral
##   [5] Highly Agree      Highly Agree     Highly Agree     Highly Agree
##   [9] Agree             Agree            Neutral          Highly Agree
##  [13] Highly Agree      Highly Agree     Highly Agree     Agree
##  [17] Highly Agree      Neutral          Agree            Highly Agree
##  [21] Agree             Highly Agree     Agree            Highly Agree
##  [25] Agree             Agree            Highly Disagree Neutral
##  [29] Highly Agree      Agree            Neutral          Agree
##  [33] Agree             Agree            Agree            Agree
##  [37] Agree             Agree            Agree            Disagree
##  [41] Highly Agree      Disagree         Disagree         Neutral
##  [45] Disagree          Agree            Highly Agree     Disagree
##  [49] Agree             Neutral          Agree            Highly Agree
```

```
##   [53] Agree          Agree          Highly Agree   Agree
##   [57] Neutral        Agree          Neutral        Highly Agree
##   [61] Disagree       Neutral        Agree          Disagree
##   [65] Highly Agree   Neutral        Agree          Agree
##   [69] Highly Agree   Agree          Neutral        Agree
##   [73] Agree          Agree          Agree          Disagree
##   [77] Agree          Neutral        Agree          Highly Agree
##   [81] Agree          Agree          Highly Agree   Agree
##   [85] Neutral        Agree          Neutral        Highly Agree
##   [89] Disagree       Neutral        Agree          Disagree
##   [93] Highly Agree   Neutral        Agree          Agree
##   [97] Highly Agree   Agree          Neutral        Agree
##  [101] Agree          Agree          Agree          Agree
##  [105] Neutral        Agree          Neutral        Agree
##  [109] Agree          Agree          Agree          Highly Agree
##  [113] Neutral        Highly Agree   Agree          Highly Agree
##  [117] Highly Agree   Highly Agree   Neutral        Neutral
##  [121] Agree          Highly Agree   Highly Agree   Highly Disagree
##  [125] Neutral        Neutral        Agree          Highly Agree
##  [129] Neutral        Agree          Agree          Highly Disagree
##  [133] Agree          Neutral        Neutral        Agree
##  [137] Agree          Agree          Agree          Neutral
##  [141] Agree          Agree          Highly Agree   Agree
##  [145] Highly Agree   Agree          Neutral        Neutral
##  [149] Agree          Neutral        Neutral        Agree
##  [153] Neutral        Agree          Neutral        Disagree
##  [157] Agree          Agree          Disagree       Agree
##  [161] Highly Agree   Agree          Agree          Agree
##  [165] Agree          Neutral        Agree          Highly Agree
##  [169] Highly Agree   Neutral        Neutral        Neutral
##  [173] Agree          Highly Agree   Neutral        Highly Agree
##  [177] Neutral        Agree          Disagree       Highly Agree
##  [181] Highly Agree   Agree          Neutral        Neutral
##  [185] Agree          Agree          Agree          Agree
##  [189] Neutral        Agree          Agree          Highly Agree
##  [193] Agree          Highly Agree   Agree          Neutral
##  [197] Highly Disagree Agree         Neutral        Highly Agree
## Levels: Highly Disagree < Disagree < Neutral < Agree < Highly Agree
```

```
levels(motivation3)
```

```
## [1] "Highly Disagree" "Disagree"        "Neutral"         "Agree"
## [5] "Highly Agree"
```

```
motivation4=factor(a$The.main.motivation.behind.using.an.E.commerce.Platform.
..Easy.comparison.of.Product.and.vendors.,order=TRUE,levels=c("Highly Disagre
e","Disagree","Neutral","Agree","Highly Agree"))
motivation4
```

```
##    [1] Highly Agree   Agree          Agree          Highly Agree
##    [5] Agree          Agree          Highly Agree   Highly Agree
```

```
##   [9] Highly Agree    Highly Agree    Agree           Agree
##  [13] Agree           Highly Agree    Highly Agree    Highly Agree
##  [17] Agree           Agree           Agree           Highly Agree
##  [21] Agree           Agree           Highly Agree    Neutral
##  [25] Agree           Neutral         Highly Disagree Agree
##  [29] Highly Agree    Agree           Neutral         Agree
##  [33] Agree           Agree           Agree           Agree
##  [37] Agree           Highly Agree    Agree           Disagree
##  [41] Highly Agree    Neutral         Agree           Neutral
##  [45] Neutral         Neutral         Highly Agree    Neutral
##  [49] Disagree        Agree           Agree           Highly Agree
##  [53] Disagree        Disagree        Agree           Disagree
##  [57] Highly Agree    Agree           Agree           Agree
##  [61] Agree           Highly Agree    Disagree        Neutral
##  [65] Agree           Neutral         Disagree        Disagree
##  [69] Neutral         Agree           Disagree        Disagree
##  [73] Neutral         Highly Disagree Disagree        Neutral
##  [77] Disagree        Agree           Agree           Highly Agree
##  [81] Disagree        Disagree        Agree           Disagree
##  [85] Highly Agree    Agree           Agree           Agree
##  [89] Agree           Highly Agree    Disagree        Neutral
##  [93] Agree           Neutral         Disagree        Disagree
##  [97] Neutral         Agree           Disagree        Disagree
## [101] Neutral         Highly Disagree Disagree        Highly Agree
## [105] Neutral         Highly Agree    Neutral         Neutral
## [109] Agree           Agree           Neutral         Agree
## [113] Highly Agree    Agree           Agree           Highly Agree
## [117] Agree           Highly Agree    Neutral         Neutral
## [121] Agree           Neutral         Neutral         Highly Disagree
## [125] Agree           Highly Agree    Highly Agree    Agree
## [129] Neutral         Agree           Agree           Highly Disagree
## [133] Agree           Neutral         Neutral         Agree
## [137] Agree           Agree           Neutral         Neutral
## [141] Agree           Neutral         Highly Agree    Highly Agree
## [145] Agree           Highly Agree    Neutral         Disagree
## [149] Agree           Neutral         Agree           Agree
## [153] Agree           Agree           Neutral         Disagree
## [157] Agree           Agree           Highly Agree    Neutral
## [161] Highly Agree    Agree           Agree           Agree
## [165] Disagree        Neutral         Agree           Highly Agree
## [169] Highly Agree    Agree           Agree           Agree
## [173] Agree           Highly Agree    Neutral         Agree
## [177] Neutral         Neutral         Agree           Agree
## [181] Highly Agree    Neutral         Neutral         Neutral
## [185] Agree           Agree           Agree           Neutral
## [189] Neutral         Agree           Neutral         Highly Agree
## [193] Highly Agree    Agree           Highly Agree    Neutral
## [197] Highly Disagree Agree           Neutral         Highly Agree
## Levels: Highly Disagree < Disagree < Neutral < Agree < Highly Agree
```

```
levels(motivation4)

## [1] "Highly Disagree" "Disagree"        "Neutral"         "Agree"
## [5] "Highly Agree"

motivation5=factor(a$The.main.motivation.behind.using.an.E.commerce.Platform.
..Best.price.with.difference.schemes.,order=TRUE,levels=c("Highly Disagree","
Disagree","Neutral","Agree","Highly Agree"))
motivation5

##   [1] Highly Agree    Agree          Highly Agree    Neutral
##   [5] Highly Agree    Highly Agree   Highly Agree    Highly Agree
##   [9] Agree           Agree          Neutral         Highly Agree
##  [13] Highly Agree    Highly Agree   Highly Agree    Agree
##  [17] Highly Agree    Neutral        Agree           Highly Agree
##  [21] Agree           Highly Agree   Agree           Highly Agree
##  [25] Agree           Highly Agree   Highly Agree    Highly Agree
##  [29] Highly Agree    Highly Agree   Highly Agree    Highly Agree
##  [33] Highly Agree    Highly Agree   Highly Agree    Highly Agree
##  [37] Highly Agree    Highly Agree   Highly Agree    Highly Agree
##  [41] Highly Agree    Highly Agree   Highly Agree    Highly Agree
##  [45] Highly Agree    Highly Agree   Highly Agree    Highly Agree
##  [49] Highly Agree    Highly Agree   Highly Agree    Highly Agree
##  [53] Highly Agree    Agree          Agree           Agree
##  [57] Agree           Neutral        Disagree        Neutral
##  [61] Disagree        Agree          Agree           Disagree
##  [65] Neutral         Neutral        Neutral         Agree
##  [69] Agree           Neutral        Neutral         Agree
##  [73] Agree           Agree          Agree           Neutral
##  [77] Disagree        Neutral        Agree           Highly Agree
##  [81] Neutral         Agree          Agree           Agree
##  [85] Agree           Neutral        Disagree        Neutral
##  [89] Disagree        Agree          Agree           Disagree
##  [93] Neutral         Neutral        Neutral         Agree
##  [97] Agree           Neutral        Neutral         Agree
## [101] Agree           Agree          Agree           Agree
## [105] Neutral         Agree          Agree           Agree
## [109] Highly Agree    Agree          Agree           Agree
## [113] Agree           Agree          Agree           Highly Agree
## [117] Agree           Highly Agree   Neutral         Agree
## [121] Agree           Agree          Agree           Highly Disagree
## [125] Agree           Highly Agree   Agree           Agree
## [129] Neutral         Agree          Neutral         Neutral
## [133] Agree           Agree          Neutral         Agree
## [137] Agree           Agree          Agree           Agree
## [141] Agree           Neutral        Agree           Highly Agree
## [145] Highly Agree    Neutral        Disagree        Agree
## [149] Agree           Neutral        Neutral         Agree
## [153] Agree           Neutral        Neutral         Disagree
## [157] Highly Agree    Highly Agree   Highly Agree    Neutral
```

```
## [161] Agree          Agree           Agree           Neutral
## [165] Agree          Agree           Agree           Neutral
## [169] Highly Agree   Agree           Agree           Agree
## [173] Neutral        Highly Agree    Neutral         Agree
## [177] Neutral        Neutral         Agree           Highly Agree
## [181] Agree          Neutral         Agree           Neutral
## [185] Agree          Agree           Agree           Agree
## [189] Agree          Agree           Neutral         Agree
## [193] Highly Agree   Highly Agree    Neutral         Disagree
## [197] Neutral        Agree           Agree           Agree
## Levels: Highly Disagree < Disagree < Neutral < Agree < Highly Agree
```

```r
levels(motivation5)
```

```
## [1] "Highly Disagree" "Disagree"        "Neutral"         "Agree"
## [5] "Highly Agree"
```

```r
motivation6=factor(a$The.main.motivation.behind.using.an.E.commerce.Platform.
..Some.products.are.not.available.in.retail.store.,order=TRUE,levels=c("Highl
y Disagree","Disagree","Neutral","Agree","Highly Agree"))
motivation6
```

```
##   [1] Highly Agree   Agree           Agree           Highly Agree
##   [5] Agree          Agree           Highly Agree    Highly Agree
##   [9] Highly Agree   Highly Agree    Agree           Agree
##  [13] Agree          Highly Agree    Highly Agree    Highly Agree
##  [17] Agree          Agree           Agree           Highly Agree
##  [21] Agree          Agree           Highly Agree    Neutral
##  [25] Agree          Neutral         Highly Disagree Agree
##  [29] Highly Agree   Agree           Neutral         Agree
##  [33] Agree          Agree           Agree           Agree
##  [37] Agree          Highly Agree    Agree           Disagree
##  [41] Highly Agree   Neutral         Neutral         Disagree
##  [45] Disagree       Neutral         Highly Agree    Disagree
##  [49] Neutral        Agree           Agree           Highly Agree
##  [53] Agree          Disagree        Highly Agree    Disagree
##  [57] Neutral        Neutral         Neutral         Highly Agree
##  [61] Agree          Neutral         Disagree        Disagree
##  [65] Highly Agree   Neutral         Disagree        Disagree
##  [69] Highly Agree   Agree           Highly Disagree Disagree
##  [73] Agree          Disagree        Disagree        Disagree
##  [77] Neutral        Agree           Agree           Highly Agree
##  [81] Agree          Disagree        Highly Agree    Disagree
##  [85] Neutral        Neutral         Neutral         Highly Agree
##  [89] Agree          Neutral         Disagree        Disagree
##  [93] Highly Agree   Neutral         Disagree        Disagree
##  [97] Highly Agree   Agree           Highly Disagree Disagree
## [101] Agree          Disagree        Disagree        Agree
## [105] Highly Disagree Agree          Neutral         Neutral
## [109] Agree          Agree           Agree           Highly Agree
## [113] Agree          Highly Agree    Agree           Agree
```

```
## [117] Highly Agree     Highly Agree     Neutral          Neutral
## [121] Agree            Agree            Agree            Neutral
## [125] Highly Agree     Agree            Neutral          Agree
## [129] Neutral          Agree            Neutral          Highly Disagree
## [133] Agree            Agree            Agree            Agree
## [137] Agree            Agree            Neutral          Agree
## [141] Neutral          Disagree         Highly Agree     Highly Agree
## [145] Agree            Agree            Neutral          Agree
## [149] Agree            Highly Disagree Highly Agree     Agree
## [153] Agree            Neutral          Agree            Disagree
## [157] Highly Disagree Agree            Highly Agree     Neutral
## [161] Agree            Agree            Agree            Agree
## [165] Highly Disagree Agree            Agree            Highly Agree
## [169] Highly Agree     Neutral          Agree            Agree
## [173] Neutral          Highly Agree     Agree            Agree
## [177] Agree            Agree            Agree            Highly Agree
## [181] Highly Agree     Disagree         Agree            Agree
## [185] Agree            Agree            Agree            Neutral
## [189] Agree            Neutral          Disagree         Highly Agree
## [193] Highly Agree     Agree            Agree            Neutral
## [197] Highly Disagree Agree            Agree            Highly Agree
## Levels: Highly Disagree < Disagree < Neutral < Agree < Highly Agree
```

```
levels(motivation6)
```

```
## [1] "Highly Disagree" "Disagree"        "Neutral"         "Agree"
## [5] "Highly Agree"
```

```
motivation7=factor(a$The.main.motivation.behind.using.an.E.commerce.Platform.
..Home.Delivery.,order=TRUE,levels=c("Highly Disagree","Disagree","Neutral","
Agree","Highly Agree"))
motivation7
```

```
##   [1] Highly Agree     Agree            Highly Agree     Neutral
##   [5] Highly Agree     Highly Agree     Highly Agree     Highly Agree
##   [9] Agree            Agree            Neutral          Highly Agree
##  [13] Highly Agree     Highly Agree     Highly Agree     Agree
##  [17] Highly Agree     Neutral          Agree            Highly Agree
##  [21] Agree            Highly Agree     Agree            Highly Agree
##  [25] Agree            Agree            Highly Disagree Neutral
##  [29] Highly Agree     Agree            Neutral          Agree
##  [33] Agree            Agree            Agree            Agree
##  [37] Neutral          Highly Agree     Agree            Neutral
##  [41] Highly Agree     Disagree         Neutral          Neutral
##  [45] Neutral          Agree            Highly Agree     Neutral
##  [49] Agree            Neutral          Agree            Highly Agree
##  [53] Disagree         Agree            Neutral          Agree
##  [57] Highly Agree     Neutral          Agree            Agree
##  [61] Disagree         Highly Agree     Disagree         Neutral
##  [65] Agree            Neutral          Agree            Agree
##  [69] Neutral          Agree            Neutral          Agree
```

```
##   [73] Agree            Agree            Agree            Neutral
##   [77] Agree            Neutral          Agree            Highly Agree
##   [81] Disagree         Agree            Neutral          Agree
##   [85] Highly Agree     Neutral          Agree            Agree
##   [89] Disagree         Highly Agree     Disagree         Neutral
##   [93] Agree            Neutral          Agree            Agree
##   [97] Neutral          Agree            Neutral          Agree
##  [101] Agree            Agree            Agree            Highly Agree
##  [105] Highly Disagree Highly Agree      Highly Agree     Agree
##  [109] Highly Agree     Highly Agree     Highly Agree     Highly Agree
##  [113] Neutral          Highly Agree     Highly Agree     Highly Agree
##  [117] Highly Agree     Highly Agree     Neutral          Agree
##  [121] Highly Agree     Highly Agree     Highly Agree     Highly Agree
##  [125] Agree            Highly Agree     Highly Agree     Highly Agree
##  [129] Neutral          Agree            Agree            Highly Disagree
##  [133] Agree            Agree            Highly Agree     Agree
##  [137] Agree            Agree            Agree            Agree
##  [141] Agree            Agree            Highly Agree     Highly Agree
##  [145] Highly Agree     Agree            Neutral          Agree
##  [149] Agree            Highly Disagree Highly Agree      Highly Agree
##  [153] Highly Agree     Agree            Agree            Disagree
##  [157] Agree            Highly Agree     Highly Agree     Highly Agree
##  [161] Agree            Agree            Highly Agree     Neutral
##  [165] Highly Agree     Agree            Agree            Highly Agree
##  [169] Highly Agree     Agree            Agree            Agree
##  [173] Agree            Highly Agree     Agree            Highly Agree
##  [177] Agree            Highly Agree     Agree            Highly Agree
##  [181] Highly Agree     Agree            Agree            Highly Agree
##  [185] Agree            Agree            Agree            Agree
##  [189] Agree            Agree            Agree            Highly Agree
##  [193] Highly Agree     Highly Agree     Agree            Neutral
##  [197] Highly Disagree Agree            Agree            Highly Agree
## Levels: Highly Disagree < Disagree < Neutral < Agree < Highly Agree
```

```
levels(motivation7)
```

```
## [1] "Highly Disagree" "Disagree"        "Neutral"         "Agree"
## [5] "Highly Agree"
```

```
motivation8=factor(a$The.main.motivation.behind.using.an.E.commerce.Platform.
..Review.of.products.by.different.existing.customers.,order=TRUE,levels=c("Hi
ghly Disagree","Disagree","Neutral","Agree","Highly Agree"))
motivation8
```

```
##   [1] Highly Agree     Agree            Agree            Highly Agree
##   [5] Agree            Agree            Highly Agree     Highly Agree
##   [9] Highly Agree     Highly Agree     Agree            Agree
##  [13] Agree            Highly Agree     Highly Agree     Highly Agree
##  [17] Agree            Agree            Agree            Highly Agree
##  [21] Agree            Agree            Highly Agree     Neutral
##  [25] Agree            Neutral          Highly Disagree Agree
```

```
##   [29] Highly Agree    Agree          Neutral          Agree
##   [33] Agree           Agree          Agree            Agree
##   [37] Agree           Agree          Agree            Disagree
##   [41] Agree           Neutral        Agree            Agree
##   [45] Disagree        Neutral        Highly Agree     Disagree
##   [49] Disagree        Agree          Agree            Highly Agree
##   [53] Neutral         Disagree       Agree            Disagree
##   [57] Agree           Neutral        Disagree         Neutral
##   [61] Agree           Agree          Disagree         Disagree
##   [65] Neutral         Neutral        Disagree         Disagree
##   [69] Agree           Neutral        Highly Disagree  Disagree
##   [73] Agree           Neutral        Disagree         Disagree
##   [77] Disagree        Agree          Agree            Highly Agree
##   [81] Neutral         Disagree       Agree            Disagree
##   [85] Agree           Neutral        Disagree         Neutral
##   [89] Agree           Agree          Disagree         Disagree
##   [93] Neutral         Neutral        Disagree         Disagree
##   [97] Agree           Neutral        Highly Disagree  Disagree
## [101] Agree            Neutral        Disagree         Agree
## [105] Neutral          Agree          Disagree         Agree
## [109] Highly Agree     Highly Agree   Agree            Highly Agree
## [113] Neutral          Highly Agree   Agree            Highly Agree
## [117] Highly Agree     Highly Agree   Neutral          Neutral
## [121] Agree            Agree          Agree            Agree
## [125] Neutral          Highly Agree   Highly Agree     Highly Agree
## [129] Neutral          Agree          Agree            Disagree
## [133] Agree            Agree          Agree            Agree
## [137] Agree            Agree          Agree            Agree
## [141] Agree            Agree          Agree            Agree
## [145] Neutral          Neutral        Neutral          Agree
## [149] Agree            Neutral        Agree            Agree
## [153] Agree            Agree          Agree            Disagree
## [157] Disagree         Agree          Highly Agree     Highly Agree
## [161] Agree            Agree          Agree            Disagree
## [165] Agree            Neutral        Agree            Highly Agree
## [169] Highly Agree     Agree          Agree            Neutral
## [173] Agree            Highly Agree    Agree           Neutral
## [177] Agree            Agree          Highly Disagree  Agree
## [181] Highly Agree     Agree          Agree            Agree
## [185] Agree            Agree          Agree            Agree
## [189] Agree            Agree          Agree            Agree
## [193] Agree            Neutral        Neutral          Neutral
## [197] Disagree         Agree          Agree            Agree
## Levels: Highly Disagree < Disagree < Neutral < Agree < Highly Agree
```

```
levels(motivation8)
```

```
## [1] "Highly Disagree" "Disagree"        "Neutral"         "Agree"
## [5] "Highly Agree"
```

```
review=factor(a$Do.you.check.the.reviews.of.a.product.that.are.given.by.diffe
rent.customers.,levels = c("Yes","No"))
levels(review)

## [1] "Yes" "No"

problem1=factor(a$Please.rate.the.following.problems.that.you.have.encountere
d.during.an.online.purchase...Delay.in.Delivery.,order=TRUE,levels = c("Alway
s","Very Often","Sometimes","Rarely","Never"))
problem1

##   [1] Rarely     Rarely     Sometimes  Rarely     Rarely     Rarely
##   [7] Sometimes  Never      Rarely     Never      Rarely     Rarely
##  [13] Rarely     Very Often Very Often Sometimes  Sometimes  Never
##  [19] Rarely     Sometimes  Rarely     Sometimes  Rarely     Never
##  [25] Sometimes  Rarely     Rarely     Never      Rarely     Never
##  [31] Sometimes  Very Often Very Often Very Often Very Often Very Often
##  [37] Very Often Very Often Sometimes  Rarely     Rarely     Very Often
##  [43] Very Often Sometimes  Rarely     Very Often Very Often Sometimes
##  [49] Sometimes  Sometimes  Sometimes  Always     Very Often Very Often
##  [55] Sometimes  Very Often Rarely     Sometimes  Sometimes  Very Often
##  [61] Sometimes  Sometimes  Very Often Rarely     Sometimes  Rarely
##  [67] Very Often Very Often Never      Rarely     Sometimes  Sometimes
##  [73] Sometimes  Very Often Rarely     Sometimes  Sometimes  Sometimes
##  [79] Sometimes  Always     Very Often Very Often Sometimes  Very Often
##  [85] Rarely     Sometimes  Sometimes  Very Often Sometimes  Sometimes
##  [91] Very Often Rarely     Sometimes  Rarely     Very Often Very Often
##  [97] Never      Rarely     Sometimes  Sometimes  Sometimes  Very Often
## [103] Rarely     Rarely     Rarely     Rarely     Rarely     Rarely
## [109] Rarely     Sometimes  Sometimes  Rarely     Never      Sometimes
## [115] Sometimes  Rarely     Never      Never      Sometimes  Sometimes
## [121] Sometimes  Rarely     Rarely     Never      Rarely     Never
## [127] Sometimes  Sometimes  Sometimes  Rarely     Rarely     Never
## [133] Sometimes  Sometimes  Sometimes  Rarely     Rarely     Rarely
## [139] Rarely     Rarely     Rarely     Never      Rarely     Sometimes
## [145] Sometimes  Rarely     Rarely     Sometimes  Sometimes  Rarely
## [151] Sometimes  Never      Sometimes  Sometimes  Sometimes  Rarely
## [157] Rarely     Rarely     Rarely     Sometimes  Never      Sometimes
## [163] Rarely     Never      Never      Sometimes  Sometimes  Rarely
## [169] Rarely     Rarely     Never      Rarely     Rarely     Never
## [175] Rarely     Sometimes  Sometimes  Sometimes  Sometimes  Sometimes
## [181] Rarely     Never      Sometimes  Sometimes  Rarely     Rarely
## [187] Rarely     Rarely     Rarely     Rarely     Never      Rarely
## [193] Sometimes  Sometimes  Rarely     Rarely     Never      Sometimes
## [199] Sometimes  Rarely
## Levels: Always < Very Often < Sometimes < Rarely < Never

levels(problem1)

## [1] "Always"     "Very Often" "Sometimes"  "Rarely"     "Never"
```

```
problem2=factor(a$Please.rate.the.following.problems.that.you.have.encountere
d.during.an.online.purchase...Quality.and.size.of.the.Product.,order=TRUE,lev
els = c("Always","Very Often","Sometimes","Rarely","Never"))
problem2
```

```
##   [1] Rarely     Rarely     Sometimes  Rarely     Rarely     Rarely
##   [7] Sometimes  Never      Rarely     Never      Rarely     Rarely
##  [13] Rarely     Very Often Very Often Sometimes  Sometimes  Never
##  [19] Rarely     Sometimes  Rarely     Rarely     Rarely     Sometimes
##  [25] Rarely     Rarely     Rarely     Sometimes  Never      Rarely
##  [31] Never      Rarely     Rarely     Rarely     Very Often Very Often
##  [37] Sometimes  Sometimes  Never      Rarely     Sometimes  Rarely
##  [43] Sometimes  Rarely     Very Often Sometimes  Very Often Very Often
##  [49] Rarely     Rarely     Sometimes  Always     Sometimes  Sometimes
##  [55] Very Often Rarely     Sometimes  Very Often Rarely     Sometimes
##  [61] Rarely     Rarely     Rarely     Very Often Rarely     Rarely
##  [67] Rarely     Rarely     Never      Sometimes  Never      Rarely
##  [73] Rarely     Rarely     Very Often Very Often Rarely     Rarely
##  [79] Sometimes  Always     Sometimes  Sometimes  Very Often Rarely
##  [85] Sometimes  Very Often Rarely     Sometimes  Rarely     Rarely
##  [91] Rarely     Very Often Rarely     Rarely     Rarely     Rarely
##  [97] Never      Sometimes  Never      Rarely     Rarely     Rarely
## [103] Very Often Never      Sometimes  Never      Sometimes  Rarely
## [109] Rarely     Rarely     Very Often Sometimes  Rarely     Rarely
## [115] Sometimes  Rarely     Rarely     Never      Rarely     Rarely
## [121] Rarely     Sometimes  Sometimes  Sometimes  Sometimes  Rarely
## [127] Sometimes  Very Often Sometimes  Sometimes  Rarely     Sometimes
## [133] Rarely     Rarely     Rarely     Rarely     Rarely     Rarely
## [139] Rarely     Never      Sometimes  Sometimes  Rarely     Rarely
## [145] Sometimes  Sometimes  Rarely     Sometimes  Rarely     Sometimes
## [151] Sometimes  Never      Sometimes  Never      Very Often Rarely
## [157] Very Often Rarely     Never      Never      Never      Sometimes
## [163] Rarely     Very Often Never      Sometimes  Sometimes  Never
## [169] Sometimes  Never      Always     Sometimes  Sometimes  Never
## [175] Sometimes  Rarely     Sometimes  Rarely     Very Often Very Often
## [181] Sometimes  Sometimes  Rarely     Rarely     Rarely     Rarely
## [187] Rarely     Rarely     Never      Sometimes  Sometimes  Rarely
## [193] Rarely     Sometimes  Sometimes  Rarely     Sometimes  Rarely
## [199] Rarely     Rarely
## Levels: Always < Very Often < Sometimes < Rarely < Never
```

```
levels(problem2)
```

```
## [1] "Always"     "Very Often" "Sometimes"  "Rarely"     "Never"
```

```
problem3=factor(a$Please.rate.the.following.problems.that.you.have.encountere
d.during.an.online.purchase...Product.Damage.,order=TRUE,levels = c("Always",
"Very Often","Sometimes","Rarely","Never"))
problem3
```

```
##    [1] Rarely       Sometimes   Sometimes   Rarely      Sometimes   Sometimes
##    [7] Rarely       Rarely      Rarely      Rarely      Sometimes   Rarely
##   [13] Rarely       Very Often  Sometimes   Sometimes   Sometimes   Rarely
##   [19] Sometimes    Sometimes   Rarely      Sometimes   Sometimes   Rarely
##   [25] Sometimes    Sometimes   Never       Sometimes   Sometimes   Rarely
##   [31] Sometimes    Rarely      Rarely      Rarely      Rarely      Rarely
##   [37] Sometimes    Sometimes   Never       Rarely      Rarely      Sometimes
##   [43] Very Often   Sometimes   Rarely      Very Often  Very Often  Sometimes
##   [49] Rarely       Sometimes   Sometimes   Always      Very Often  Very Often
##   [55] Sometimes    Very Often  Rarely      Rarely      Very Often  Always
##   [61] Sometimes    Never       Sometimes   Rarely      Never       Rarely
##   [67] Very Often   Rarely      Never       Never       Sometimes   Very Often
##   [73] Never        Very Often  Very Often  Sometimes   Rarely      Sometimes
##   [79] Sometimes    Always      Very Often  Very Often  Sometimes   Very Often
##   [85] Rarely       Rarely      Very Often  Always      Sometimes   Never
##   [91] Sometimes    Rarely      Never       Rarely      Very Often  Rarely
##   [97] Never        Never       Sometimes   Very Often  Never       Very Often
##  [103] Very Often   Never       Rarely      Never       Never       Rarely
##  [109] Never        Rarely      Rarely      Never       Rarely      Never
##  [115] Sometimes    Never       Never       Never       Never       Rarely
##  [121] Never        Rarely      Rarely      Rarely      Very Often  Never
##  [127] Rarely       Rarely      Sometimes   Rarely      Never       Rarely
##  [133] Sometimes    Rarely      Never       Rarely      Rarely      Rarely
##  [139] Rarely       Rarely      Rarely      Sometimes   Rarely      Sometimes
##  [145] Very Often   Never       Rarely      Rarely      Rarely      Rarely
##  [151] Rarely       Never       Rarely      Never       Very Often  Rarely
##  [157] Never        Never       Sometimes   Never       Never       Sometimes
##  [163] Never        Never       Never       Rarely      Sometimes   Never
##  [169] Never        Never       Sometimes   Rarely      Sometimes   Never
##  [175] Never        Never       Sometimes   Rarely      Sometimes   Rarely
##  [181] Rarely       Sometimes   Rarely      Never       Rarely      Rarely
##  [187] Rarely       Rarely      Rarely      Rarely      Sometimes   Rarely
##  [193] Sometimes    Very Often  Never       Rarely      Rarely      Sometimes
##  [199] Rarely       Rarely
## Levels: Always < Very Often < Sometimes < Rarely < Never
```

```
levels(problem3)
```

```
## [1] "Always"     "Very Often" "Sometimes"  "Rarely"     "Never"
```

```
problem4=factor(a$Please.rate.the.following.problems.that.you.have.encountere
d.during.an.online.purchase...Delivery.not.completed.in.given.time.,order=TRU
E,levels = c("Always","Very Often","Sometimes","Rarely","Never"))
problem4
```

```
##    [1] Rarely       Rarely      Never       Rarely      Sometimes   Rarely
##    [7] Sometimes    Sometimes   Rarely      Never       Rarely      Rarely
##   [13] Sometimes    Very Often  Sometimes   Never       Sometimes   Rarely
##   [19] Rarely       Very Often  Always      Sometimes   Very Often  Never
##   [25] Rarely       Sometimes   Never       Never       Rarely      Sometimes
##   [31] Sometimes    Sometimes   Never       Never       Never       Never
```

```
##   [37] Very Often Very Often Rarely     Sometimes  Very Often Very Often
##   [43] Sometimes  Very Often Very Often Sometimes  Very Often Sometimes
##   [49] Sometimes  Rarely     Sometimes  Always     Sometimes  Rarely
##   [55] Always     Very Often Sometimes  Very Often Very Often Rarely
##   [61] Rarely     Sometimes  Sometimes  Very Often Sometimes  Rarely
##   [67] Sometimes  Sometimes  Never      Rarely     Never      Rarely
##   [73] Rarely     Sometimes  Sometimes  Sometimes  Sometimes  Rarely
##   [79] Sometimes  Always     Sometimes  Rarely     Always     Very Often
##   [85] Sometimes  Very Often Very Often Rarely     Rarely     Sometimes
##   [91] Sometimes  Very Often Sometimes  Rarely     Sometimes  Sometimes
##   [97] Never      Rarely     Never      Rarely     Rarely     Sometimes
##  [103] Sometimes  Rarely     Rarely     Rarely     Sometimes  Rarely
##  [109] Rarely     Sometimes  Sometimes  Rarely     Sometimes  Sometimes
##  [115] Very Often Never      Never      Rarely     Never      Sometimes
##  [121] Never      Rarely     Rarely     Rarely     Sometimes  Never
##  [127] Sometimes  Very Often Sometimes  Sometimes  Sometimes  Never
##  [133] Rarely     Sometimes  Rarely     Rarely     Rarely     Rarely
##  [139] Rarely     Never      Rarely     Never      Rarely     Sometimes
##  [145] Rarely     Never      Rarely     Sometimes  Sometimes  Never
##  [151] Rarely     Never      Rarely     Sometimes  Sometimes  Rarely
##  [157] Rarely     Sometimes  Never      Sometimes  Never      Sometimes
##  [163] Rarely     Never      Never      Rarely     Rarely     Rarely
##  [169] Rarely     Never      Never      Rarely     Sometimes  Never
##  [175] Rarely     Rarely     Sometimes  Rarely     Sometimes  Sometimes
##  [181] Rarely     Never      Sometimes  Rarely     Rarely     Rarely
##  [187] Rarely     Rarely     Never      Rarely     Never      Rarely
##  [193] Sometimes  Rarely     Never      Rarely     Never      Rarely
##  [199] Sometimes  Rarely
## Levels: Always < Very Often < Sometimes < Rarely < Never
```

```
levels(problem4)
```

```
## [1] "Always"     "Very Often" "Sometimes"  "Rarely"     "Never"
```

```
problem5=factor(a$Please.rate.the.following.problems.that.you.have.encountere
d.during.an.online.purchase...Payment.not.successful.,order=TRUE,levels = c("
Always","Very Often","Sometimes","Rarely","Never"))
problem5
```

```
##    [1] Sometimes  Sometimes  Very Often Rarely     Sometimes  Rarely
##    [7] Sometimes  Rarely     Rarely     Never      Sometimes  Sometimes
##   [13] Rarely     Never      Sometimes  Very Often Rarely     Sometimes
##   [19] Sometimes  Sometimes  Never      Sometimes  Very Often Very Often
##   [25] Sometimes  Sometimes  Never      Rarely     Very Often Never
##   [31] Rarely     Very Often Rarely     Rarely     Rarely     Rarely
##   [37] Sometimes  Rarely     Never      Sometimes  Never      Rarely
##   [43] Very Often Sometimes  Rarely     Very Often Very Often Very Often
##   [49] Sometimes  Sometimes  Sometimes  Always     Sometimes  Sometimes
##   [55] Very Often Sometimes  Very Often Rarely     Rarely     Never
##   [61] Sometimes  Rarely     Sometimes  Rarely     Rarely     Rarely
##   [67] Sometimes  Sometimes  Never      Sometimes  Sometimes  Sometimes
```

```
##   [73] Never      Rarely     Sometimes  Very Often Sometimes  Sometimes
##   [79] Sometimes  Always     Sometimes  Sometimes  Very Often Sometimes
##   [85] Very Often Rarely     Rarely     Never      Sometimes  Rarely
##   [91] Sometimes  Rarely     Rarely     Rarely     Sometimes  Sometimes
##   [97] Never      Sometimes  Sometimes  Sometimes  Never      Rarely
##  [103] Sometimes  Rarely     Never      Rarely     Sometimes  Never
##  [109] Never      Never      Sometimes  Never      Sometimes  Rarely
##  [115] Very Often Never      Sometimes  Rarely     Never      Rarely
##  [121] Never      Never      Never      Never      Rarely     Never
##  [127] Never      Very Often Sometimes  Rarely     Rarely     Never
##  [133] Sometimes  Never      Sometimes  Rarely     Rarely     Rarely
##  [139] Never      Never      Never      Sometimes  Rarely     Never
##  [145] Never      Rarely     Rarely     Never      Sometimes  Never
##  [151] Rarely     Never      Rarely     Never      Rarely     Rarely
##  [157] Rarely     Rarely     Rarely     Rarely     Never      Sometimes
##  [163] Never      Never      Never      Rarely     Never      Never
##  [169] Rarely     Never      Never      Rarely     Very Often Never
##  [175] Never      Rarely     Rarely     Rarely     Rarely     Rarely
##  [181] Never      Sometimes  Never      Sometimes  Rarely     Rarely
##  [187] Rarely     Never      Never      Never      Sometimes  Rarely
##  [193] Never      Never      Rarely     Rarely     Never      Sometimes
##  [199] Never      Rarely
## Levels: Always < Very Often < Sometimes < Rarely < Never
```

```r
levels(problem5)
```

```
## [1] "Always"     "Very Often" "Sometimes"  "Rarely"     "Never"
```

```r
problem6=factor(a$Please.rate.the.following.problems.that.you.have.encountere
d.during.an.online.purchase...Difference.between.displayed.or.delivered.produ
ct.,order=TRUE,levels = c("Always","Very Often","Sometimes","Rarely","Never")
)
problem6
```

```
##    [1] Rarely     Rarely     Very Often Sometimes  Rarely     Rarely
##    [7] Sometimes  Rarely     Sometimes  Never      Rarely     Sometimes
##   [13] Sometimes  Sometimes  Sometimes  Rarely     Sometimes  Sometimes
##   [19] Sometimes  Very Often Sometimes  Sometimes  Rarely     Never
##   [25] Sometimes  Sometimes  Rarely     Rarely     Very Often Sometimes
##   [31] Sometimes  Sometimes  Rarely     Rarely     Rarely     Rarely
##   [37] Very Often Very Often Rarely     Rarely     Sometimes  Very Often
##   [43] Sometimes  Always     Very Often Sometimes  Very Often Sometimes
##   [49] Rarely     Rarely     Sometimes  Always     Very Often Rarely
##   [55] Very Often Sometimes  Sometimes  Very Often Very Often Rarely
##   [61] Rarely     Never      Rarely     Very Often Never      Rarely
##   [67] Sometimes  Rarely     Never      Never      Never      Very Often
##   [73] Rarely     Very Often Sometimes  Sometimes  Rarely     Rarely
##   [79] Sometimes  Always     Very Often Rarely     Very Often Sometimes
##   [85] Sometimes  Very Often Very Often Rarely     Rarely     Never
##   [91] Rarely     Very Often Never      Rarely     Sometimes  Rarely
##   [97] Never      Never      Never      Very Often Rarely     Very Often
```

```
## [103] Sometimes   Never       Rarely      Never       Sometimes   Rarely
## [109] Rarely      Rarely      Very Often  Never       Sometimes   Never
## [115] Sometimes   Rarely      Rarely      Rarely      Rarely      Rarely
## [121] Rarely      Sometimes   Sometimes   Very Often  Always      Never
## [127] Sometimes   Always      Sometimes   Sometimes   Sometimes   Sometimes
## [133] Sometimes   Rarely      Never       Rarely      Rarely      Rarely
## [139] Rarely      Rarely      Never       Sometimes   Rarely      Sometimes
## [145] Sometimes   Very Often  Rarely      Sometimes   Very Often  Sometimes
## [151] Sometimes   Never       Rarely      Never       Sometimes   Rarely
## [157] Sometimes   Rarely      Rarely      Rarely      Never       Sometimes
## [163] Sometimes   Always      Sometimes   Very Often  Sometimes   Never
## [169] Sometimes   Never       Sometimes   Very Often  Very Often  Never
## [175] Sometimes   Rarely      Sometimes   Rarely      Very Often  Rarely
## [181] Sometimes   Sometimes   Rarely      Never       Rarely      Rarely
## [187] Rarely      Rarely      Rarely      Never       Sometimes   Rarely
## [193] Sometimes   Sometimes   Very Often  Rarely      Sometimes   Sometimes
## [199] Rarely      Rarely
## Levels: Always < Very Often < Sometimes < Rarely < Never
```

```r
levels(problem6)
```

```
## [1] "Always"     "Very Often" "Sometimes"  "Rarely"     "Never"
```

```r
mode_of_payment=factor(a$Which.mode.of.payment.do.you.prefer.while.online.sho
pping.,levels = c("Cash on Delivery","Debit/Credit Card","e-Wallet","Google P
ay","Net Banking","UPI"))
mode_of_payment
```

```
##   [1] Debit/Credit Card e-Wallet          Debit/Credit Card Google Pay
##   [5] e-Wallet          Debit/Credit Card e-Wallet          e-Wallet
##   [9] e-Wallet          e-Wallet          Debit/Credit Card e-Wallet
##  [13] Debit/Credit Card Debit/Credit Card e-Wallet          e-Wallet
##  [17] e-Wallet          e-Wallet          Debit/Credit Card Debit/Credit C
ard
##  [21] Debit/Credit Card Net Banking       Debit/Credit Card Debit/Credit C
ard
##  [25] e-Wallet          Debit/Credit Card Net Banking       Debit/Credit C
ard
##  [29] Debit/Credit Card Debit/Credit Card e-Wallet          e-Wallet
##  [33] Debit/Credit Card Debit/Credit Card Debit/Credit Card Debit/Credit C
ard
##  [37] e-Wallet          Debit/Credit Card Debit/Credit Card Debit/Credit C
ard
##  [41] Debit/Credit Card Debit/Credit Card Debit/Credit Card Cash on Delive
ry
##  [45] Debit/Credit Card Debit/Credit Card e-Wallet          e-Wallet
##  [49] Net Banking       Debit/Credit Card Debit/Credit Card e-Wallet
##  [53] e-Wallet          Net Banking       Debit/Credit Card e-Wallet
##  [57] Debit/Credit Card Debit/Credit Card Debit/Credit Card e-Wallet
##  [61] Debit/Credit Card Net Banking       e-Wallet          Debit/Credit C
ard
```

```
##  [65] e-Wallet          Debit/Credit Card Cash on Delivery  e-Wallet
##  [69] Debit/Credit Card e-Wallet          e-Wallet          e-Wallet
##  [73] Net Banking       e-Wallet          Debit/Credit Card Debit/Credit C
ard
##  [77] Net Banking       e-Wallet          e-Wallet          Debit/Credit C
ard
##  [81] Debit/Credit Card Debit/Credit Card e-Wallet          Debit/Credit C
ard
##  [85] e-Wallet          e-Wallet          Net Banking       e-Wallet
##  [89] Net Banking       Debit/Credit Card e-Wallet          Debit/Credit C
ard
##  [93] Debit/Credit Card Debit/Credit Card Debit/Credit Card e-Wallet
##  [97] e-Wallet          Debit/Credit Card Debit/Credit Card e-Wallet
## [101] Debit/Credit Card e-Wallet          e-Wallet          Debit/Credit C
ard
## [105] Cash on Delivery  Debit/Credit Card Debit/Credit Card e-Wallet
## [109] Debit/Credit Card Net Banking       Debit/Credit Card e-Wallet
## [113] Cash on Delivery  Debit/Credit Card e-Wallet          Cash on Delive
ry
## [117] Debit/Credit Card Net Banking       Cash on Delivery  Debit/Credit C
ard
## [121] e-Wallet          Debit/Credit Card Debit/Credit Card Debit/Credit C
ard
## [125] Debit/Credit Card Cash on Delivery  Debit/Credit Card Debit/Credit C
ard
## [129] Cash on Delivery  Cash on Delivery  e-Wallet          Debit/Credit C
ard
## [133] Debit/Credit Card Cash on Delivery  e-Wallet          Debit/Credit C
ard
## [137] Debit/Credit Card e-Wallet          Debit/Credit Card Debit/Credit C
ard
## [141] Cash on Delivery  Cash on Delivery  Debit/Credit Card Debit/Credit C
ard
## [145] Debit/Credit Card Cash on Delivery  Cash on Delivery  Debit/Credit C
ard
## [149] Cash on Delivery  Net Banking       Debit/Credit Card Cash on Delive
ry
## [153] e-Wallet          Debit/Credit Card Cash on Delivery  Debit/Credit C
ard
## [157] e-Wallet          Cash on Delivery  Net Banking       e-Wallet
## [161] Debit/Credit Card Cash on Delivery  Net Banking       e-Wallet
## [165] Net Banking       Debit/Credit Card e-Wallet          Debit/Credit C
ard
## [169] Net Banking       Debit/Credit Card Cash on Delivery  Cash on Delive
ry
## [173] Debit/Credit Card Cash on Delivery  e-Wallet          Cash on Delive
ry
## [177] Debit/Credit Card Debit/Credit Card Cash on Delivery  e-Wallet
## [181] Cash on Delivery  e-Wallet          Cash on Delivery  e-Wallet
## [185] Debit/Credit Card Debit/Credit Card Debit/Credit Card Debit/Credit C
```

```
ard
## [189] Debit/Credit Card Cash on Delivery  Cash on Delivery   e-Wallet
## [193] e-Wallet         Debit/Credit Card Cash on Delivery  Cash on Delive
ry
## [197] Cash on Delivery  Debit/Credit Card Cash on Delivery  Debit/Credit C
ard
## 6 Levels: Cash on Delivery Debit/Credit Card e-Wallet ... UPI
```

```
levels(mode_of_payment)
```

```
## [1] "Cash on Delivery"  "Debit/Credit Card" "e-Wallet"
## [4] "Google Pay"        "Net Banking"       "UPI"
```

```
website=factor(a$Which.website.are.you.more.comfortable.buying.from.,levels =
c("Amazon","Decathlon","Snapdeal","Myntra","eBay","Flipkart","Bewakoof","Grof
ers","Lulu and sky","Shein","Nykaa"))
website
```

```
##   [1] Lulu and sky Bewakoof      Myntra        Nykaa         Nykaa
##   [6] Amazon       Amazon        Amazon        Nykaa         Lulu and sky
##  [11] Bewakoof     Nykaa         Decathlon     Myntra        Decathlon
##  [16] Nykaa        Grofers       Amazon        Amazon        Snapdeal
##  [21] Snapdeal     Decathlon     Amazon        Decathlon     Lulu and sky
##  [26] Bewakoof     Amazon        Lulu and sky Flipkart      Snapdeal
##  [31] Shein        Decathlon     Amazon        Amazon        Bewakoof
##  [36] Flipkart     Amazon        Decathlon     Bewakoof      Snapdeal
##  [41] Flipkart     Decathlon     Amazon        Amazon        Snapdeal
##  [46] Shein        Grofers       Grofers       Amazon        Amazon
##  [51] Bewakoof     Grofers       Grofers       Amazon        Shein
##  [56] Myntra       Bewakoof      Grofers       Bewakoof      Myntra
##  [61] Lulu and sky Bewakoof      Amazon        Myntra        Snapdeal
##  [66] Bewakoof     Nykaa         Flipkart      Lulu and sky Myntra
##  [71] Nykaa        Myntra        Myntra        Nykaa         Flipkart
##  [76] Decathlon    Grofers       Lulu and sky Flipkart      Snapdeal
##  [81] Flipkart     Flipkart      Nykaa         Myntra        Amazon
##  [86] Nykaa        Myntra        Flipkart      Bewakoof      Lulu and sky
##  [91] Amazon       Shein         Grofers       Grofers       Myntra
##  [96] Decathlon    Myntra        eBay          Bewakoof      Amazon
## [101] Flipkart     Amazon        Nykaa         Myntra        Shein
## [106] Nykaa        Myntra        Myntra        Amazon        eBay
## [111] Bewakoof     Amazon        Amazon        Amazon        Grofers
## [116] Bewakoof     Amazon        eBay          Nykaa         Lulu and sky
## [121] Myntra       Lulu and sky Amazon        Amazon        Flipkart
## [126] Amazon       Lulu and sky Flipkart      Grofers       Myntra
## [131] Bewakoof     Bewakoof      Grofers       eBay          Myntra
## [136] Nykaa        Shein         Bewakoof      Shein         Bewakoof
## [141] eBay         Snapdeal      Amazon        Amazon        Shein
## [146] Snapdeal     Shein         Grofers       eBay          Bewakoof
## [151] Flipkart     eBay          Nykaa         Amazon        Lulu and sky
## [156] Flipkart     Myntra        Flipkart      Amazon        Flipkart
## [161] Bewakoof     Nykaa         eBay          Snapdeal      Bewakoof
```

```
## [166] Myntra        Amazon        Myntra        Lulu and sky Amazon
## [171] Bewakoof      Amazon        Myntra        Bewakoof     Myntra
## [176] Decathlon     Grofers       Myntra        Decathlon    Flipkart
## [181] Myntra        Amazon        Bewakoof      Amazon       Snapdeal
## [186] Bewakoof      Decathlon     Decathlon     Myntra       Myntra
## [191] Lulu and sky  Shein         Grofers       Grofers      Myntra
## [196] Bewakoof      Grofers       eBay          Grofers      Myntra
## 11 Levels: Amazon Decathlon Snapdeal Myntra eBay Flipkart Bewakoof ... Nyk
aa
```

```
levels(website)
```

```
##  [1] "Amazon"      "Decathlon"   "Snapdeal"    "Myntra"        "eBay"
##  [6] "Flipkart"    "Bewakoof"    "Grofers"     "Lulu and sky"  "Shein"
## [11] "Nykaa"
```

```
aspect1=factor(a$What.do.you.think.is.the.most.important.aspect.of.an.online.
shopping.site...Security.,order= TRUE,levels = c("Not Important","Low Importa
nce","Neutral","Important","Very Important"))
aspect1
```

```
##   [1] Very Important Important      Very Important Important      Importan
t
##   [6] Low Importance Very Important Very Important Important      Very Imp
ortant
##  [11] Very Important Very Important Very Important Neutral        Importan
t
##  [16] Very Important Neutral        Important      Very Important Very Imp
ortant
##  [21] Very Important Very Important Very Important Important      Importan
t
##  [26] Neutral        Very Important Very Important Very Important Very Imp
ortant
##  [31] Very Important Very Important Important      Important      Very Imp
ortant
##  [36] Important      Very Important Very Important Very Important Neutral
##  [41] Important      Neutral        Neutral        Important      Importan
t
##  [46] Important      Neutral        Important      Important      Neutral
##  [51] Important      Very Important Important      Low Importance Importan
t
##  [56] Neutral        Important      Neutral        Important      Neutral
##  [61] Neutral        Important      Neutral        Neutral        Neutral
##  [66] Very Important Neutral        Low Importance Very Important Importan
t
##  [71] Neutral        Neutral        Important      Neutral        Neutral
##  [76] Important      Important      Neutral        Important      Very Imp
ortant
##  [81] Important      Low Importance Important      Neutral        Importan
t
##  [86] Neutral        Important      Neutral        Neutral        Importan
```

```
t
##   [91] Neutral         Neutral         Neutral         Very Important Neutral
##   [96] Low Importance Very Important Important         Neutral         Neutral
## [101] Important        Neutral         Neutral         Very Important Importan
t
## [106] Very Important Neutral         Important        Very Important Very Imp
ortant
## [111] Neutral         Very Important Neutral         Important        Very Imp
ortant
## [116] Very Important Very Important Important         Neutral         Importan
t
## [121] Very Important Neutral         Neutral         Low Importance Neutral
## [126] Very Important Very Important Important         Low Importance Importan
t
## [131] Very Important Very Important Important        Important        Neutral
## [136] Important        Important        Important        Important        Importan
t
## [141] Very Important Neutral         Very Important Neutral         Very Imp
ortant
## [146] Very Important Neutral         Very Important Important        Very Imp
ortant
## [151] Neutral         Very Important Important        Important        Very Imp
ortant
## [156] Low Importance Neutral         Important        Important        Importan
t
## [161] Very Important Very Important Important        Very Important Very Imp
ortant
## [166] Very Important Important        Very Important Very Important Importan
t
## [171] Very Important Important        Important        Important        Very Imp
ortant
## [176] Neutral         Very Important Very Important Neutral         Very Imp
ortant
## [181] Very Important Neutral         Important        Neutral         Importan
t
## [186] Important        Important        Important        Important        Very Imp
ortant
## [191] Neutral         Very Important Neutral         Very Important Very Imp
ortant
## [196] Neutral         Very Important Important        Important        Very Imp
ortant
## 5 Levels: Not Important < Low Importance < Neutral < ... < Very Important
```

```r
levels(aspect1)
```

```
## [1] "Not Important"  "Low Importance" "Neutral"        "Important"
## [5] "Very Important"
```

```r
aspect2=factor(a$What.do.you.think.is.the.most.important.aspect.of.an.online.
shopping.site...Privacy.,order= TRUE,levels = c("Not Important","Low Importan
```

```
ce","Neutral","Important","Very Important"))
aspect2
```

```
##   [1] Very Important Important     Very Important Important     Neutral
##   [6] Low Importance Very Important Very Important Important     Very Imp
ortant
##  [11] Very Important Very Important Important     Neutral       Importan
t
##  [16] Very Important Neutral       Very Important Very Important Very Imp
ortant
##  [21] Very Important Very Important Important     Important     Neutral
##  [26] Neutral       Very Important Very Important Very Important Importan
t
##  [31] Very Important Very Important Important     Important     Very Imp
ortant
##  [36] Important     Neutral       Very Important Important     Neutral
##  [41] Important     Important     Important     Important     Low Impo
rtance
##  [46] Neutral       Neutral       Neutral       Neutral       Low Impo
rtance
##  [51] Important     Very Important Neutral       Neutral       Very Imp
ortant
##  [56] Low Importance Neutral       Low Importance Neutral       Importan
t
##  [61] Low Importance Very Important Important     Low Importance Importan
t
##  [66] Very Important Low Importance Neutral       Very Important Importan
t
##  [71] Not Important  Low Importance Important     Low Importance Low Impo
rtance
##  [76] Neutral       Neutral       Low Importance Important     Very Imp
ortant
##  [81] Neutral       Neutral       Very Important Low Importance Neutral
##  [86] Low Importance Neutral       Important     Low Importance Very Imp
ortant
##  [91] Important     Low Importance Important     Very Important Low Impo
rtance
##  [96] Neutral       Very Important Important     Not Important  Low Impo
rtance
## [101] Important     Low Importance Low Importance Very Important Importan
t
## [106] Very Important Neutral       Important     Very Important Very Imp
ortant
## [111] Neutral       Very Important Important     Important     Very Imp
ortant
## [116] Very Important Very Important Important     Neutral       Very Imp
ortant
## [121] Very Important Neutral       Neutral       Neutral       Neutral
## [126] Important     Very Important Very Important Low Importance Very Imp
ortant
```

```
## [131] Very Important Very Important Very Important Important    Very Imp
ortant
## [136] Important    Important    Important    Important    Importan
t
## [141] Very Important Neutral     Very Important Important    Very Imp
ortant
## [146] Very Important Neutral     Very Important Important    Very Imp
ortant
## [151] Neutral      Very Important Very Important Important    Very Imp
ortant
## [156] Not Important  Neutral     Important    Important    Very Imp
ortant
## [161] Very Important Very Important Very Important Very Important Very Imp
ortant
## [166] Important    Important    Very Important Very Important Importan
t
## [171] Very Important Important    Important    Important    Very Imp
ortant
## [176] Neutral      Very Important Very Important Neutral     Very Imp
ortant
## [181] Very Important Neutral     Important    Very Important Importan
t
## [186] Important    Important    Important    Important    Very Imp
ortant
## [191] Neutral      Very Important Important    Very Important Very Imp
ortant
## [196] Neutral      Very Important Very Important Important    Very Imp
ortant
## 5 Levels: Not Important < Low Importance < Neutral < ... < Very Important
```

```
levels(aspect2)
```

```
## [1] "Not Important"  "Low Importance" "Neutral"      "Important"
## [5] "Very Important"
```

```
aspect3=factor(a$What.do.you.think.is.the.most.important.aspect.of.an.online.
shopping.site...Trust.,order= TRUE,levels = c("Not Important","Low Importance
","Neutral","Important","Very Important"))
aspect3
```

```
##  [1] Important    Low Importance Low Importance Very Important Importan
t
##  [6] Very Important Neutral     Important    Very Important Very Imp
ortant
## [11] Neutral      Very Important Important    Important    Very Imp
ortant
## [16] Very Important Very Important Important    Neutral     Very Imp
ortant
## [21] Very Important Neutral     Neutral     Neutral     Neutral
## [26] Important    Very Important Very Important Low Importance Very Imp
ortant
```

```
##   [31] Very Important Very Important Very Important Important      Very Imp
ortant
##   [36] Important      Important      Important      Important      Importan
t
##   [41] Very Important Neutral        Very Important Important      Very Imp
ortant
##   [46] Very Important Neutral        Very Important Important      Very Imp
ortant
##   [51] Neutral        Very Important Very Important Important      Very Imp
ortant
##   [56] Not Important  Neutral        Important      Important      Very Imp
ortant
##   [61] Very Important Very Important Very Important Very Important Very Imp
ortant
##   [66] Important      Important      Very Important Very Important Importan
t
##   [71] Very Important Important      Important      Important      Very Imp
ortant
##   [76] Neutral        Very Important Very Important Neutral        Very Imp
ortant
##   [81] Very Important Neutral        Important      Very Important Importan
t
##   [86] Important      Important      Important      Important      Very Imp
ortant
##   [91] Neutral        Very Important Important      Very Important Very Imp
ortant
##   [96] Neutral        Very Important Very Important Important      Very Imp
ortant
## [101] Very Important Important      Very Important Important      Neutral
## [106] Low Importance Very Important Very Important Important      Very Imp
ortant
## [111] Very Important Very Important Important      Neutral        Importan
t
## [116] Very Important Neutral        Very Important Very Important Very Imp
ortant
## [121] Very Important Very Important Important      Important      Neutral
## [126] Neutral        Very Important Very Important Very Important Importan
t
## [131] Very Important Very Important Important      Important      Very Imp
ortant
## [136] Important      Neutral        Very Important Important      Neutral
## [141] Important      Important      Important      Important      Low Impo
rtance
## [146] Neutral        Neutral        Neutral        Neutral        Low Impo
rtance
## [151] Important      Very Important Neutral        Neutral        Very Imp
ortant
## [156] Low Importance Neutral        Low Importance Neutral        Importan
t
## [161] Low Importance Very Important Important      Low Importance Importan
```

```
t
## [166] Very Important Low Importance Neutral        Very Important Importan
t
## [171] Not Important  Low Importance Important      Low Importance Low Impo
rtance
## [176] Neutral        Neutral        Low Importance Important      Very Imp
ortant
## [181] Neutral        Neutral        Very Important Low Importance Neutral
## [186] Low Importance Neutral        Important      Low Importance Very Imp
ortant
## [191] Important      Low Importance Important      Very Important Low Impo
rtance
## [196] Neutral        Very Important Important      Not Important  Low Impo
rtance
## 5 Levels: Not Important < Low Importance < Neutral < ... < Very Important
```

```r
levels(aspect3)
```

```
## [1] "Not Important"  "Low Importance" "Neutral"        "Important"
## [5] "Very Important"
```

```r
aspect4=factor(a$What.do.you.think.is.the.most.important.aspect.of.an.online.
shopping.site...Convenience.,order= TRUE,levels = c("Not Important","Low Impo
rtance","Neutral","Important","Very Important"))
aspect4
```

```
##   [1] Very Important Important      Very Important Important      Importan
t
##   [6] Low Importance Very Important Very Important Important      Very Imp
ortant
##  [11] Very Important Very Important Very Important Neutral        Importan
t
##  [16] Very Important Neutral        Important      Very Important Very Imp
ortant
##  [21] Very Important Very Important Very Important Important      Importan
t
##  [26] Neutral        Very Important Very Important Very Important Very Imp
ortant
##  [31] Very Important Very Important Important      Important      Very Imp
ortant
##  [36] Important      Neutral        Very Important Important      Neutral
##  [41] Very Important Neutral        Important      Important      Neutral
##  [46] Neutral        Neutral        Neutral        Neutral        Low Impo
rtance
##  [51] Important      Very Important Neutral        Neutral        Very Imp
ortant
##  [56] Low Importance Neutral        Low Importance Neutral        Importan
t
##  [61] Neutral        Neutral        Important      Low Importance Importan
t
##  [66] Very Important Low Importance Neutral        Very Important Importan
```

```
t
##  [71] Not Important  Low Importance Very Important Low Importance Low Impo
rtance
##  [76] Neutral        Neutral        Low Importance Important      Very Imp
ortant
##  [81] Neutral        Neutral        Very Important Low Importance Neutral
##  [86] Low Importance Neutral        Important      Neutral        Neutral
##  [91] Important      Low Importance Important      Very Important Low Impo
rtance
##  [96] Neutral        Very Important Important      Not Important  Low Impo
rtance
## [101] Very Important Low Importance Low Importance Very Important Importan
t
## [106] Very Important Important      Very Important Very Important Very Imp
ortant
## [111] Neutral        Very Important Important      Important      Very Imp
ortant
## [116] Very Important Very Important Important      Neutral        Very Imp
ortant
## [121] Very Important Neutral        Neutral        Very Important Neutral
## [126] Important      Important      Important      Low Importance Very Imp
ortant
## [131] Very Important Important      Very Important Important      Neutral
## [136] Important      Important      Important      Very Important Importan
t
## [141] Very Important Neutral        Very Important Important      Very Imp
ortant
## [146] Important      Neutral        Very Important Important      Very Imp
ortant
## [151] Neutral        Very Important Important      Neutral        Very Imp
ortant
## [156] Low Importance Important      Important      Important      Very Imp
ortant
## [161] Very Important Important      Important      Very Important Importan
t
## [166] Very Important Important      Very Important Important      Importan
t
## [171] Very Important Important      Important      Important      Importan
t
## [176] Low Importance Very Important Important      Important      Importan
t
## [181] Very Important Neutral        Important      Neutral        Importan
t
## [186] Important      Important      Very Important Important      Very Imp
ortant
## [191] Neutral        Very Important Important      Very Important Importan
t
## [196] Neutral        Important      Very Important Important      Very Imp
ortant
## 5 Levels: Not Important < Low Importance < Neutral < ... < Very Important
```

```
levels(aspect4)
```

```
## [1] "Not Important"  "Low Importance" "Neutral"        "Important"
## [5] "Very Important"
```

```
product=factor(a$When.you.shop.online..what.do.you.mostly.shop.for.,levels =
c("Accessories","Apparel","Books","Footwear","Cosmetics","Electronics","Consu
mer Durables","Home Appliances"))
product
```

```
##    [1] Cosmetics         Cosmetics         Accessories       Cosmetics
##    [5] Electronics       Books             Home Appliances   Home Appliance
s
##    [9] Footwear          Home Appliances   Electronics       Cosmetics
##   [13] Books             Footwear          Apparel           Apparel
##   [17] Home Appliances   Electronics       Cosmetics         Cosmetics
##   [21] Electronics       Electronics       Footwear          Cosmetics
##   [25] Electronics       Electronics       Cosmetics         Accessories
##   [29] Consumer Durables Footwear          Apparel           Apparel
##   [33] Apparel           Consumer Durables Apparel           Electronics
##   [37] Home Appliances   Electronics       Electronics       Books
##   [41] Cosmetics         Consumer Durables Footwear          Home Appliance
s
##   [45] Books             Accessories       Footwear          Books
##   [49] Consumer Durables Footwear          Home Appliances   Apparel
##   [53] Footwear          Home Appliances   Electronics       Electronics
##   [57] Footwear          Accessories       Cosmetics         Consumer Durab
les
##   [61] Accessories       Electronics       Cosmetics         Cosmetics
##   [65] Electronics       Footwear          Electronics       Accessories
##   [69] Books             Home Appliances   Books             Cosmetics
##   [73] Accessories       Books             Cosmetics         Home Appliance
s
##   [77] Accessories       Accessories       Apparel           Consumer Durab
les
##   [81] Home Appliances   Books             Accessories       Accessories
##   [85] Books             Books             Apparel           Home Appliance
s
##   [89] Home Appliances   Accessories       Consumer Durables Cosmetics
##   [93] Home Appliances   Cosmetics         Accessories       Cosmetics
##   [97] Cosmetics         Books             Electronics       Electronics
##  [101] Books             Consumer Durables Cosmetics         Apparel
##  [105] Home Appliances   Cosmetics         Apparel           Footwear
##  [109] Books             Cosmetics         Electronics       Apparel
##  [113] Electronics       Cosmetics         Apparel           Electronics
##  [117] Cosmetics         Consumer Durables Home Appliances   Consumer Durab
les
##  [121] Footwear          Consumer Durables Consumer Durables Books
##  [125] Books             Footwear          Accessories       Accessories
##  [129] Cosmetics         Books             Home Appliances   Consumer Durab
```

```
les
## [133] Cosmetics         Electronics       Footwear          Accessories
## [137] Books             Footwear          Consumer Durables Electronics
## [141] Home Appliances   Books             Consumer Durables Home Appliance
s
## [145] Accessories       Cosmetics         Home Appliances   Consumer Durab
les
## [149] Consumer Durables Consumer Durables Footwear          Footwear
## [153] Cosmetics         Consumer Durables Accessories       Apparel
## [157] Cosmetics         Accessories       Cosmetics         Accessories
## [161] Accessories       Electronics       Apparel           Consumer Durab
les
## [165] Apparel           Electronics       Apparel           Electronics
## [169] Home Appliances   Footwear          Home Appliances   Consumer Durab
les
## [173] Apparel           Books             Home Appliances   Footwear
## [177] Consumer Durables Cosmetics         Electronics       Consumer Durab
les
## [181] Books             Consumer Durables Accessories       Consumer Durab
les
## [185] Home Appliances   Books             Home Appliances   Electronics
## [189] Footwear          Footwear          Footwear          Footwear
## [193] Accessories       Home Appliances   Consumer Durables Consumer Durab
les
## [197] Books             Accessories       Cosmetics         Accessories
## 8 Levels: Accessories Apparel Books Footwear Cosmetics ... Home Appliances
```

```r
levels(product)
```

```
## [1] "Accessories"       "Apparel"           "Books"
## [4] "Footwear"          "Cosmetics"         "Electronics"
## [7] "Consumer Durables" "Home Appliances"
```

```r
offline=factor(a$Do.you.prefer.checking.the.offline.shops.before.making.your.
purchase.online.,levels = c("Yes","No"))
levels(offline)
```

```
## [1] "Yes" "No"
```

Q1) Does occupation impact the frequency of online shopping?

#Ho: Occupation has no influence on the frequency of online shopping #H1: Occupation has an influence on the frequency of online shopping

```r
chisq.test(occupation,frequency1,simulate.p.value = TRUE)
```

```
##
##  Pearson's Chi-squared test with simulated p-value (based on 2000
```

```
##   replicates)
##
## data:  occupation and frequency1
## X-squared = 17.883, df = NA, p-value = 0.005997

# P-value < 0.05 , Reject Null Hypothesis(Ho)
# There is an association between occupation and their frequency of online sh
opping
t1=table(occupation,frequency1)
t1

##            frequency1
## occupation Occasionally
##    Business          13
##    Employed          18
##    Other              5
##    Student           35
##            frequency1
## occupation On the basis of Requirement (When Product is not available in m
arket)
##    Business
16
##    Employed
9
##    Other
17
##    Student
54
##            frequency1
## occupation Routine (Include Window Shopping)
##    Business                            3
##    Employed                           12
##    Other                               2
##    Student                            16

# To see which occupation shows more tendency to shop online
barplot(t1,beside=TRUE,legend=rownames(t1))
```
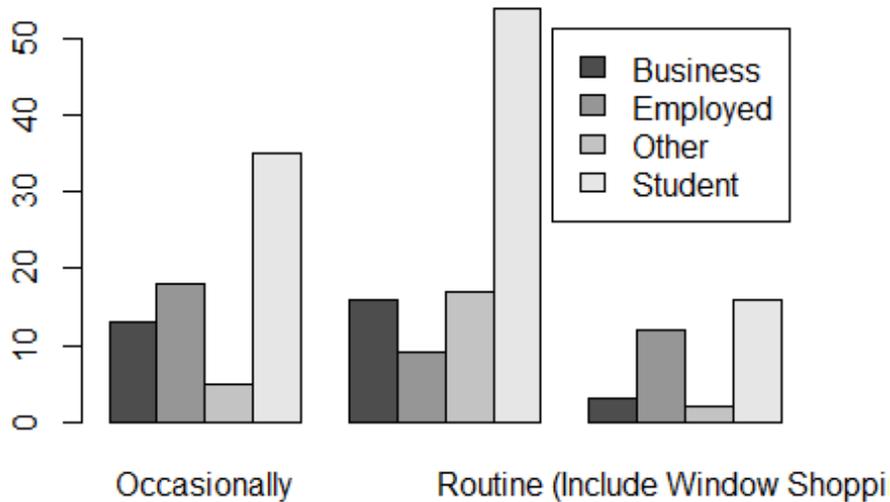
Barplot shows that 'Students' are the most frequent shoppers online

Q2) Does income affect the choice of products bought online?

#Ho: Income does not affect the choice of products bought online #H1: Income affects the choice of products bought bought online

```
a1=aov(a$Income..per.month..~product)
summary(a1)

##                Df    Sum Sq   Mean Sq F value Pr(>F)
## product         7 1.162e+11 1.660e+10   0.731  0.646
## Residuals     192 4.362e+12 2.272e+10

# P-value > 0.05 , Accept Null Hypothesis(Ho)
# Income does not have an influence in the choice of products bought online
t2=table(a$Income..per.month..,product)
t2

##         product
##           Accessories Apparel Books Footwear Cosmetics Electronics
##   10000             0       0     1        2         0           1
##   20000             3       1     2        2         2           0
##   40000             1       0     1        0         0           1
##   50000             1       5     3        4         7           2
```

```
##   60000           0          0          1          0          1          2
##   70000           0          0          2          4          2          2
##   80000           0          0          1          0          1          0
##   90000           2          1          0          1          0          2
##  100000           3          3          1          1          0          0
##  120000           1          0          0          1          2          1
##  130000           0          0          1          0          1          3
##  140000           1          0          0          2          1          0
##  150000           0          0          2          0          0          1
##  160000           0          0          0          0          0          2
##  180000           2          0          0          1          3          1
##  200000           1          0          1          1          2          2
##  210000           2          0          0          1          0          0
##  230000           0          1          0          0          1          1
##  250000           1          2          0          0          0          0
##  260000           1          1          0          0          1          0
##  280000           0          2          1          0          0          1
##  290000           0          0          1          0          0          0
##  310000           1          0          0          1          0          0
##  320000           0          0          0          0          1          2
##  340000           0          0          0          0          1          0
##  360000           0          1          0          1          3          1
##  380000           0          0          2          0          0          0
##  400000           0          0          0          1          0          0
##  450000           0          0          0          0          1          1
##  500000           4          1          2          0          1          1
##  630000           1          0          1          0          0          0
##          product
##           Consumer Durables Home Appliances
##   10000                  1                0
##   20000                  3                4
##   40000                  1                0
##   50000                  8                3
##   60000                  1                1
##   70000                  1                3
##   80000                  0                0
##   90000                  0                0
##  100000                  0                1
##  120000                  1                0
##  130000                  0                2
##  140000                  0                2
##  150000                  2                0
##  160000                  1                0
##  180000                  1                1
##  200000                  1                1
##  210000                  1                1
##  230000                  0                0
##  250000                  0                0
##  260000                  0                0
##  280000                  0                2
```

```
##    290000                    0                  0
##    310000                    0                  0
##    320000                    0                  2
##    340000                    0                  0
##    360000                    0                  0
##    380000                    1                  0
##    400000                    1                  0
##    450000                    1                  0
##    500000                    2                  2
##    630000                    0                  1
```

Q3) Which products have the highest demand?

```
table(product)
```

```
## product
##        Accessories              Apparel               Books             Footwear
##                 25                   18                  23                   23
##          Cosmetics          Electronics Consumer Durables     Home Appliances
##                 31                   27                  27                   26
```

Cosmetics, Consumer Durables and Electronics are the top 3 products bought online.

Q4) Which are the top 3 most motivating factors that attract individuals to online shopping?

#to count how many respondents highly agree with the factor - Shopping on internet saves time.

```
b=a$The.main.motivation.behind.using.an.E.commerce.Platform...Shopping.on.int
ernet.saves.time.
agree= length(which(b=="Highly Agree"))
agree
```

```
## [1] 60
```

60 respondents highly agree with this motivation factor

#to count how many respondents highly agree with the factor - Shopping at any time of the day.

```
c=a$The.main.motivation.behind.using.an.E.commerce.Platform...It.is.a.great.a
dvantage.to.be.able.to.shop.at.any.time.of.the.day..24.7...
agree1= length(which(c=="Highly Agree"))
agree1
```

```
## [1] 38
```

38 respondents highly agree with this motivation factor

#to count how many respondents highly agree with the factor - Selection of goods is very broad

```
d=a$The.main.motivation.behind.using.an.E.commerce.Platform...Selection.of.go
ods.is.very.broad.
agree2= length(which(d=="Highly Agree"))
agree2

## [1] 47

# 47 respondents highly agree with this motivation factor

#to count how many respondents highly agree with the factor - Easy comparison
of products
e=a$The.main.motivation.behind.using.an.E.commerce.Platform...Easy.comparison
.of.Product.and.vendors.
agree3= length(which(e=="Highly Agree"))
agree3

## [1] 41

# 41 respondents highly agree with this motivation factor

#to count how many respondents highly agree with the factor - Best prices wit
h good schemes.
e=a$The.main.motivation.behind.using.an.E.commerce.Platform...Best.price.with
.difference.schemes.
agree3= length(which(e=="Highly Agree"))
agree3

## [1] 57

# 57 respondents highly agree with this motivation factor

#to count how many respondents highly agree with the factor - Products not av
ailable at stores.
f=a$The.main.motivation.behind.using.an.E.commerce.Platform...Some.products.a
re.not.available.in.retail.store.
agree4= length(which(f=="Highly Agree"))
agree4

## [1] 42

# 42 respondents highly agree with this motivation factor

#to count how many respondents highly agree with the factor - Home delivery o
f the product.
g=a$The.main.motivation.behind.using.an.E.commerce.Platform...Home.Delivery.
```

```
agree5= length(which(g=="Highly Agree"))
agree5
```

```
## [1] 67
```

```
# 67 respondents highly agree with this motivation factor
```

```
#to count how many respondents highly agree with the factor - Easy comparison
of products
h=a$The.main.motivation.behind.using.an.E.commerce.Platform...Review.of.produ
cts.by.different.existing.customers.
agree6= length(which(h=="Highly Agree"))
agree6
```

```
## [1] 31
```

 # 31 respondents highly agree with this motivation factor

Top 3 motivation factors of online shopping are :

Shopping on internet saves time

Best prices with good schemes

Home delivery of the product

Q5) Does age influence the probability of checking online reviews?

#Ho: Age does not influence the probability of checking reviews #H1: Age influences the probability of checking reviews

```
t.test(a$Age.~a$Do.you.check.the.reviews.of.a.product.that.are.given.by.diffe
rent.customers.)
```

```
##
##  Welch Two Sample t-test
##
## data:  a$Age. by a$Do.you.check.the.reviews.of.a.product.that.are.given.by
.different.customers.
## t = -0.29216, df = 58.912, p-value = 0.7712
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  -5.646626  4.207862
## sample estimates:
```

```
##  mean in group No mean in group Yes
##          37.43590             38.15528
```

P - value > 0.05 , accept Null Hypothesis

Age does not influence the probability of checking reviews

Q6) Which online payment mode is the preferred by the people?

```
table(mode_of_payment)
```

```
## mode_of_payment
##  Cash on Delivery Debit/Credit Card          e-Wallet        Google Pay
##                32               93                58                 1
##       Net Banking              UPI
##                16                0
```

```
t2=table(mode_of_payment)
barplot(t2)
```
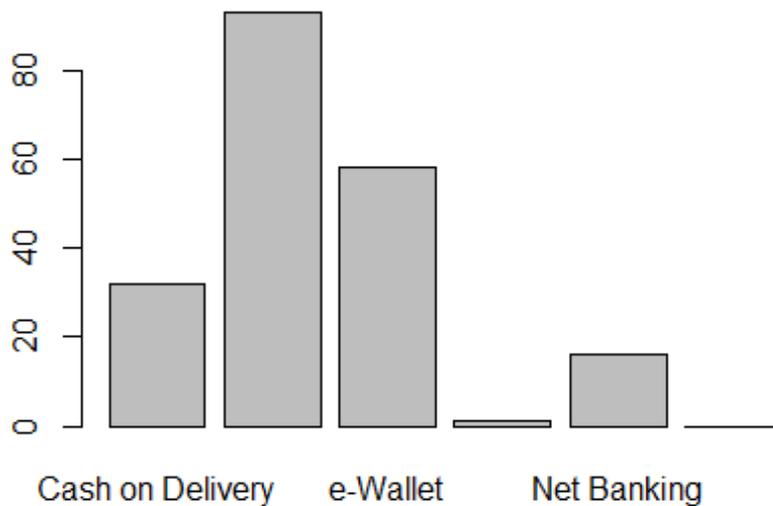

\# e-Wallet and Debit/Credit Card are the most preferred modes of payment

Q7) Does occupation affect preference of checking offline shops before making an online purchase?

#Ho: There is no association between occupation and the tendency to check offline stores before an online purchase #H1: There is an association between occupation and the tendency to check offline stores before an online purchase

```
chisq.test(a$Occupation.,a$Do.you.prefer.checking.the.offline.shops.before.ma
king.your.purchase.online.,simulate.p.value = TRUE)

##
##  Pearson's Chi-squared test with simulated p-value (based on 2000
##  replicates)
##
## data:  a$Occupation. and a$Do.you.prefer.checking.the.offline.shops.before
.making.your.purchase.online.
## X-squared = 36.856, df = NA, p-value = 0.0004998

t3=table(a$Occupation.,a$Do.you.prefer.checking.the.offline.shops.before.maki
ng.your.purchase.online.)
barplot(t3,beside=TRUE,legend=rownames(t3))
```
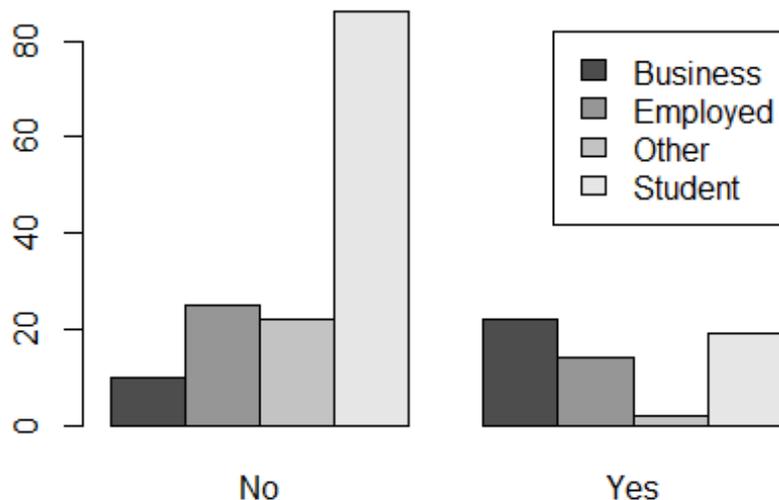

P - value < 0.05 , Failed to Accept Ho

There is an association between occupation and the tendency to check offline stores before an online purchase.

Q8) Does income affect mode of payment?

#Ho: Income does not influence the mode of payment #H1: Income influences the mode of payment

```
pay=aov(a$Income..per.month..~a$Which.mode.of.payment.do.you.prefer.while.onl
ine.shopping.)
summary(pay)

##                                                             Df    Sum Sq
## a$Which.mode.of.payment.do.you.prefer.while.online.shopping.  4 3.196e+10
## Residuals                                                   195 4.446e+12
##                                                                Mean Sq F v
alue
## a$Which.mode.of.payment.do.you.prefer.while.online.shopping. 7.991e+09   0
.351
## Residuals                                                    2.280e+10
##                                                                 Pr(>F)
## a$Which.mode.of.payment.do.you.prefer.while.online.shopping.   0.843
## Residuals

boxplot(a$Income..per.month..~a$Which.mode.of.payment.do.you.prefer.while.onl
ine.shopping.)
```
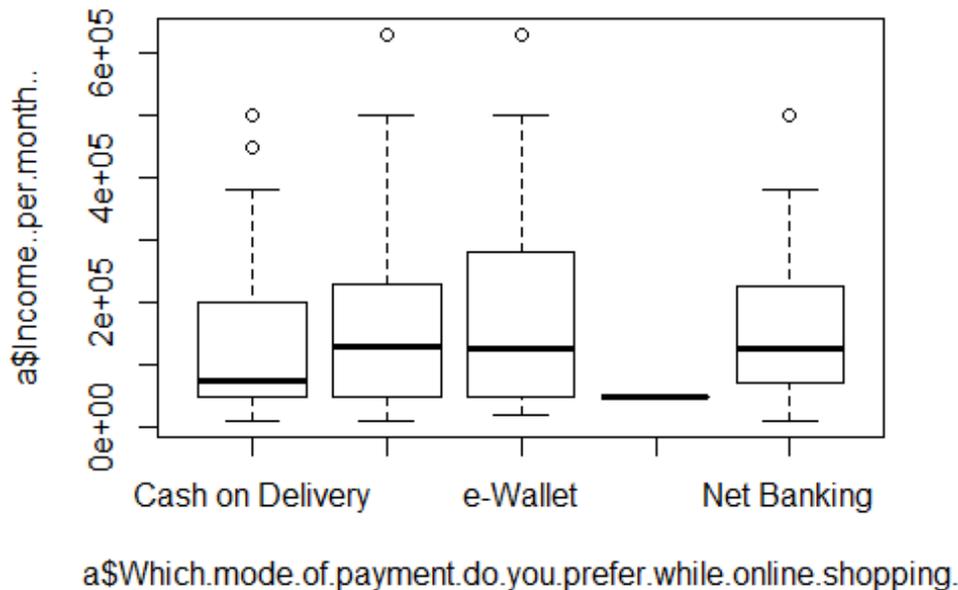
P - value > 0.5 , Accept Ho # Income does not influence the mode of payment.

Q9) Does age affect mode of payment?

#Ho: Age has no influence on mode of payment #H1: Age has an influence on mode of payment

```
pay1=aov(a$Age.~a$Which.mode.of.payment.do.you.prefer.while.online.shopping.)
summary(pay1)

##                                                                 Df Sum Sq Me
an Sq
## a$Which.mode.of.payment.do.you.prefer.while.online.shopping.    4  15097
3774
## Residuals                                                      195  23782
122
##                                                                 F value Pr(>F
)
## a$Which.mode.of.payment.do.you.prefer.while.online.shopping.    30.95 <2e-1
6 ***
## Residuals
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

P - value < 0.05 , Failed to Accept Ho

Age has an influence on mode of payment. The mode of payment preferred depends on the age of the person.

Q10) Which is the most popular website?

```
table(website)

## website
##      Amazon    Decathlon     Snapdeal       Myntra         eBay       Flipk
art
##          37           13           11           29            9
17
##     Bewakoof      Grofers Lulu and sky        Shein        Nykaa
##          26           18           14           10           16

t4=table(website)
barplot(t4)
```
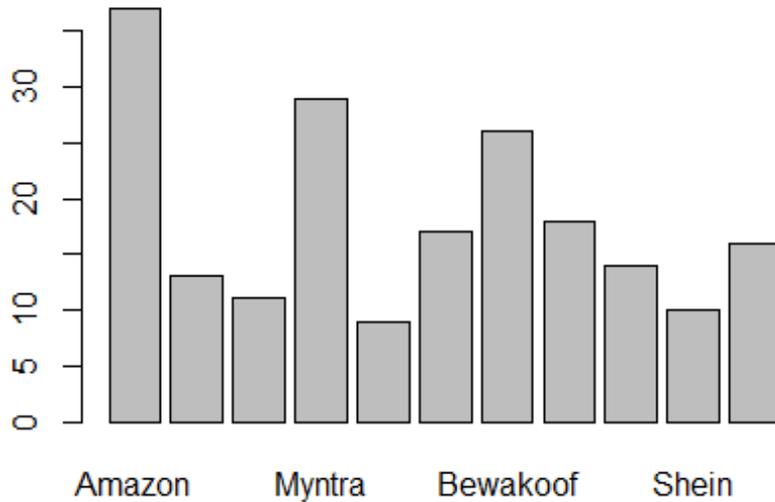
Amazon, Bewakoof and Myntra are the most popular websites that users shop from.

Conclusion

The target population for a research is the entire set of units for which the research data are to be used to make inferences. In our research we want to gain information regarding the consumer's perspective for online shopping of apparels. Mostly, the youth generations are more inclined towards online shopping, the target population for a research is the entire set of units for which the research data are to be used to make inferences. Income does not have an influence in the choice of products bought online. The consumers are highly motivated behind using e-commerce platforms compare to problem they have encountered during an online purchase. Top 3 motivation factors of online shopping are shopping on internet saves time, Best prices with good schemes, Home delivery of the product. Age does not influence the probability of checking reviews. E-Wallet and Debit/Credit Card are the most preferred modes of payment. There is an association between occupation and the tendency to check offline stores before an online purchase. Income does not influence the mode of payment. Age has an influence on mode of payment. The mode of payment preferred depends on the age of the person. The popular sites and sites which is mostly visited by the consumers are Amazon, Bewakoof and Myntra are the most popular websites that users shop from. These are the analysis which we drawn from our research.

To understand COVID-19 awareness of people and impact of lifestyle and various sectors of the economy

Submitted By-
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Introduction:

As we all know a new respiratory disease called COVID-19 is spreading across the world. India has also reported cases from states and the government is trying to contain the spread of the disease.

Hence, we have conducted a research survey to understand the awareness of people about COVID-19 impact on their lifestyles and their views on how the economy and various sectors of the society will be affected by the pandemic. We have adopted an exploratory research study for our findings via Google form survey to have a better understanding of the pre-COVID-19 and existing lifestyles of people.

Methodology:

Our research is basically an exploratory research; we have used primary data collection method. We created a questionnaire using Google form and circulated it to people from different states, age and profession. Sample size was 60.
We have used R-studio Version 1.3.959 for hypothesis testing and data interpretation.

Hypothesis Testing:

We have total twelve questions for hypothesis testing. Our data set has mainly categorical variables. Most of our tests are chi-square test.

Tests are done as follows:

```
getwd()
setwd("E:/R_forBA")
coa<-read.csv("Covid-19 Awareness.csv")
str(coa)
summary(coa)
```

Output:
```
> getwd()
[1] "E:/R_forBA"
> setwd("E:/R_forBA")
> coa<-read.csv("Covid-19 Awareness.csv")
> str(coa)
'data.frame':  60 obs. of  34 variables:
 $ Timestamp
: chr  "2020/07/08 2:43:52 AM GMT+5:30" "2020/07/08 10:24:57 AM GMT+5:30"
"2020/07/08 10:28:46 AM GMT+5:30" "2020/07/08 10:30:19 AM GMT+5:30" ...
 $ Age..yrs..
: chr  "18-25" "18-25" "18-25" "26-35" ...
 $ Gender
: int  2 1 2 1 1 2 1 1 1 2 ...
 $ Profession
: int  1 1 1 1 1 1 2 1 1 2 ...
 $ Region.of.Stay
: int  1 3 1 1 2 3 2 2 1 1 ...
 $ How.concerned.are.you.about.the.spread.of.COVID.19..Coronavirus..in.India
: int  5 5 4 5 5 4 5 5 5 ...
 $ How.confident.are.you.about.the.steps.taken.by.Indian.Government.to.contain.and
.control.the.spread.of.COVID.19..Coronavirus..in.the.country.:
int  2 2 2 2 2 3 4 5 4 4 ...
 $ How.confident.are.you.about.the.healthcare.system.of.the.country.to.contain.and.
control.the.spread.of.COVID.19..coronavirus..
 : int  1 3 4 3 4 1 3 5 4 4 ...
 $ As.compared.to.last.week.how.would.you.assess.the.situation.in.your.city.in.
general.
: chr  "Longer than 6 months" "Within 4-6 months" "Within 2-3 months"
 "Within 4-6 months" ...
 $ i..Washing.hands.regularly.with.soap.hand.wash
: int  5 5 5 5 5 5 5 5 5 5 ...
 $ ii..Using.face.mask.gloves.when.leaving.the.house
: int  5 5 5 4 5 5 5 5 5 5 ...
 $ iii..Taking.Preventive.medicines.food.products.to.build.immunity
: int  3 5 5 3 4 5 5 5 5 4 ...
 $ iv..Avoiding.any.cooked.meals.from.restaurant
: int  3 5 5 5 5 5 5 5 5 3 ...
 $ v..Avoiding.social.gatherings.or.crowded.places
: int  4 5 5 5 5 5 5 5 5 5 ...
 $ vi..Stopped.all.outside.help..maids..laundry.etc..
: int  1 5 4 5 4 5 5 5 5 5 ...
 $ vii..Neutral..No.change.in.daily.routine
: int  2 2 2 1 1 1 5 1 1 4 ...
 $ i..Safety.concerns.in.buying.products.from.stores.shops
: int  4 4 5 5 4 5 5 5 5 4 ...
 $ ii..I.am.waiting.for.a.sale.to.be.launched.so.that.I.can.buy.products.at.a.good.
price
: int  1 2 5 5 3 5 4 4 5 2 ...
 $ iii..Avoiding.any.unnecessary.purchases.currently
: int  5 5 5 4 5 5 5 5 5 4 ...
 $ iv..The.store.of.my.choice.is.still.not.open
```

```
 : int  2 2 3 2 1 3 3 5 2 1 ...
 $ i..Large.business.corporation.will.be.affected
 : int  4 4 5 4 5 3 5 5 5 4 ...
 $ ii..Given.the.economy.and.my.personal.finances.I.have.to.be.very.careful.how.I.
spend.my.money
 : int  5 5 5 5 4 5 5 5 5 5 ...
 $ iii..Unemployment.is.likely.to.increase
 : int  5 5 5 5 5 5 5 5 5 5 ...
 $ iv..Economy.is.likely.to.go.into.a.recession.slowdown
 : int  2 5 5 4 4 3 5 4 5 4 ...
 $ v..Small.business.corporation.will.be.affected
 : int  5 5 5 5 5 5 2 5 5 5 ...
 $ vi..My.household.income.has.gone.down.after.the.advent.of.this.virus
 : int  4 5 5 4 5 4 4 5 4 3 ...
 $ How.has.your.use.digital.payment.apps..like.paytm..google.pay..amazon.pay.etc...
changed.in.the.last.10.15.days.
 : int  2 3 5 5 4 5 2 5 4 4 ...
 $ i..Clothing.and.fashion.accessories
 : chr  "Significantly Decreased in comparison to pre COVID crisis" "Significantly
Decreased in comparison to pre COVID crisis" "Significantly Increased in comparison
to pre COVID crisis" "Significantly Decreased in comparison to pre COVID crisis" ...
 $ ii..Out.of.home.entertainment.movies.pubs..restaurant.etc..
 : int  1 1 5 1 1 1 1 1 1 1 ..-.
 $ iii..Food.delivery.takeaway.Zomato..Swiggy.
 : int  1 1 5 5 2 2 1 1 1 2 ...
 $ iv..Healthcare.services
 : int  2 4 5 3 5 3 3 4 5 4 ...
 $ v..Mobile.Broadband.Recharges
 : int  5 3 5 4 4 2 4 4 2 5 ...
 $ vi..Electronics.Gadgets
 : int  1 4 5 4 5 2 4 5 1 1 ...
 $ vii..Travel..Road..Rail..Air.
 : int  1 1 5 1 2 3 1 1 1 1 ...
> summary(coa)
  Timestamp          Age..yrs..          Gender       Profession       Region.of.Stay
 Length:60          Length:60        Min.   :1.0   Min.   :1.000   Min.   :1.00
 Class :character   Class :character 1st Qu.:1.0   1st Qu.:1.000   1st Qu.:1.00
 Mode  :character   Mode  :character Median :1.0   Median :1.000   Median :2.00
                                     Mean   :1.5   Mean   :1.633   Mean   :1.95
                                     3rd Qu.:2.0   3rd Qu.:2.000   3rd Qu.:3.00
                                     Max.   :3.0   Max.   :6.000   Max.   :5.00

 How.concerned.are.you.about.the.spread.of.COVID.19..Coronavirus..in.India
 Min.   :1.00
 1st Qu.:4.00
 Median :5.00
 Mean   :4.55
 3rd Qu.:5.00
 Max.   :5.00

 How.confident.are.you.about.the.steps.taken.by.Indian.Government.to.contain.and.
control.the.spread.of.COVID.19..Coronavirus..in.the.country.
 Min.   :1.000
 1st Qu.:2.000
 Median :3.000
 Mean   :2.833
 3rd Qu.:3.250
 Max.   :5.000

 How.confident.are.you.about.the.healthcare.system.of.the.country.to.contain.and.
control.the.spread.of.COVID.19..coronavirus..
 Min.   :1.000
 1st Qu.:1.000
 Median :3.000
 Mean   :2.817
 3rd Qu.:4.000
 Max.   :5.000

 As.compared.to.last.week.how.would.you.assess.the.situation.in.your.city.in.
```

```
general.
 Length:60
 Class :character
 Mode  :character
```

```
 i..Washing.hands.regularly.with.soap.hand.wash
Min.   :1.000
1st Qu.:5.000
Median :5.000
Mean   :4.717
3rd Qu.:5.000
Max.   :5.000
```

```
 ii..Using.face.mask.gloves.when.leaving.the.house
Min.   :1.000
1st Qu.:5.000
Median :5.000
Mean   :4.683
3rd Qu.:5.000
Max.   :5.000
```

```
 iii..Taking.Preventive.medicines.food.products.to.build.immunity
Min.   :1.000
1st Qu.:3.000
Median :4.000
Mean   :4.119
3rd Qu.:5.000
Max.   :5.000
NA's   :1
 iv..Avoiding.any.cooked.meals.from.restaurant
Min.   :1.00
1st Qu.:4.00
Median :5.00
Mean   :4.45
3rd Qu.:5.00
Max.   :5.00
```

```
 v..Avoiding.social.gatherings.or.crowded.places
Min.   :1.00
1st Qu.:5.00
Median :5.00
Mean   :4.65
3rd Qu.:5.00
Max.   :5.00
```

```
 vi..Stopped.all.outside.help..maids..laundry.etc..
Min.   :1.000
1st Qu.:3.750
Median :5.000
Mean   :4.033
3rd Qu.:5.000
Max.   :5.000
```

```
 vii..Neutral..No.change.in.daily.routine
Min.   :1.000
1st Qu.:1.000
Median :2.000
Mean   :2.383
3rd Qu.:4.000
Max.   :5.000
```

```
 i..Safety.concerns.in.buying.products.from.stores.shops
Min.   :1.000
1st Qu.:4.000
Median :5.000
Mean   :4.517
```

```
 3rd Qu.:5.000
 Max.   :5.000
```

ii..I.am.waiting.for.a.sale.to.be.launched.so.that.I.can.buy.products.at.a.good.
price
```
 Min.   :1.000
 1st Qu.:1.000
 Median :2.000
 Mean   :2.617
 3rd Qu.:4.000
 Max.   :5.000
```

iii..Avoiding.any.unnecessary.purchases.currently
```
 Min.   :1.000
 1st Qu.:4.000
 Median :5.000
 Mean   :4.317
 3rd Qu.:5.000
 Max.   :5.000
```

iv..The.store.of.my.choice.is.still.not.open
```
 Min.   :1.000
 1st Qu.:1.000
 Median :3.000
 Mean   :2.733
 3rd Qu.:4.000
 Max.   :5.000
```

i..Large.business.corporation.will.be.affected
```
 Min.   :1.0
 1st Qu.:4.0
 Median :5.0
 Mean   :4.3
 3rd Qu.:5.0
 Max.   :5.0
```

ii..Given.the.economy.and.my.personal.finances.I.have.to.be.very.careful.how.I.
spend.my.money
```
 Min.   :1.000
 1st Qu.:4.000
 Median :5.000
 Mean   :4.467
 3rd Qu.:5.000
 Max.   :5.000
```

iii..Unemployment.is.likely.to.increase
```
 Min.   :1.000
 1st Qu.:4.000
 Median :5.000
 Mean   :4.517
 3rd Qu.:5.000
 Max.   :5.000
```

iv..Economy.is.likely.to.go.into.a.recession.slowdown
```
 Min.   :1.000
 1st Qu.:4.000
 Median :4.000
 Mean   :4.267
 3rd Qu.:5.000
 Max.   :5.000
```

v..Small.business.corporation.will.be.affected
```
 Min.   :1.000
 1st Qu.:5.000
 Median :5.000
 Mean   :4.717
 3rd Qu.:5.000
 Max.   :5.000
```

```
 vi..My.household.income.has.gone.down.after.the.advent.of.this.virus
 Min.   :1.000
 1st Qu.:3.000
 Median :5.000
 Mean   :3.967
 3rd Qu.:5.000
 Max.   :5.000

 How.has.your.use.digital.payment.apps..like.paytm..google.pay..amazon.pay.etc...
 changed.in.the.last.10.15.days.
 Min.   :1.0
 1st Qu.:3.0
 Median :4.0
 Mean   :3.8
 3rd Qu.:5.0
 Max.   :5.0

 i..Clothing.and.fashion.accessories
 Length:60
 Class :character
 Mode  :character




 ii..Out.of.home.entertainment.movies.pubs..restaurant.etc..
 Min.   :1.000
 1st Qu.:1.000
 Median :1.000
 Mean   :1.317
 3rd Qu.:1.000
 Max.   :5.000

 iii..Food.delivery.takeaway.Zomato..Swiggy.  iv..Healthcare.services
 Min.   :1.00                                 Min.   :1.00
 1st Qu.:1.00                                 1st Qu.:2.00
 Median :1.00                                 Median :3.00
 Mean   :1.75                                 Mean   :3.05
 3rd Qu.:2.00                                 3rd Qu.:4.00
 Max.   :5.00                                 Max.   :5.00

 v..Mobile.Broadband.Recharges vi..Electronics.Gadgets vii..Travel..Road..Rail..Air.
 Min.   :1.000                 Min.   :1.000           Min.   :1.000
 1st Qu.:3.000                 1st Qu.:2.000           1st Qu.:1.000
 Median :3.000                 Median :3.500           Median :1.000
 Mean   :3.733                 Mean   :3.367           Mean   :1.333
 3rd Qu.:5.000                 3rd Qu.:5.000           3rd Qu.:1.000
 Max.   :5.000                 Max.   :5.000           Max.   :5.000
```

```
#Factor
Gender=as.factor(c("Male","Female","Others"))
Gender
x=factor(Gender,order=TRUE,levels = c("Male","Female","Others"))
x

Profession=as.factor(c("Student","Private Sector","Govt Employee","Health Sector
Employee","Business","Others"))
Profession
y=factor(Profession,order=TRUE,levels =c("Student","Private Sector","Govt Employee","Health
Sector Employee","Business","Others") )
y

Region.of.Stay=as.factor(c("Metropolitan Cities","Urban","Semi Urban","Semi Rural","Rural"))
Region.of.Stay
```

z=factor(Profession,order=TRUE,levels =c("Metropolitan Cities","Urban","Semi Urban","Semi Rural","Rural"))
z

Output:
```
> #Factor
> Gender=as.factor(c("Male","Female","Others"))
> Gender
[1] Male    Female Others
Levels: Female Male Others
> x=factor(Gender,order=TRUE,levels = c("Male","Female","Others"))
> x
[1] Male    Female Others
Levels: Male < Female < Others
>
> Profession=as.factor(c("Student","Private Sector","Govt Employee","Healt
h Sector Employee","Business","Others"))
> Profession
[1] Student               Private Sector       Govt Employee
[4] Health Sector Employee Business             Others
6 Levels: Business Govt Employee Health Sector Employee Others ... Student
> y=factor(Profession,order=TRUE,levels =c("Student","Private Sector","Gov
t Employee","Health Sector Employee","Business","Others") )
> y
[1] Student               Private Sector       Govt Employee
[4] Health Sector Employee Business             Others
6 Levels: Student < Private Sector < Govt Employee < ... < Others
>
> Region.of.Stay=as.factor(c("Metropolitan Cities","Urban","Semi Urban","S
emi Rural","Rural"))
> Region.of.Stay
[1] Metropolitan Cities Urban              Semi Urban         Semi Rural
[5] Rural
Levels: Metropolitan Cities Rural Semi Rural Semi Urban Urban
> z=factor(Profession,order=TRUE,levels =c("Metropolitan Cities","Urban","
Semi Urban","Semi Rural","Rural") )
> z
[1] <NA> <NA> <NA> <NA> <NA> <NA>
Levels: Metropolitan Cities < Urban < Semi Urban < Semi Rural < Rural
```

Hypothesis Question & Interpretation:

Q1. Does location of stay has impact on people washing hand regularly?

Chi-square test: there are two categorical independent variable

Null hypothesis: location of stay does not have significant effect on people washing hand regularly

Alternative hypothesis: location of stay has effect on people washing hand regularly

chisq.test(coa$Region.of.Stay,coa$i..Washing.hands.regularly.with.soap.hand.wash)

Output:
```
> chisq.test(coa$Region.of.Stay,coa$i..Washing.hands.regularly.with.soap.h
and.wash)

        Pearson's Chi-squared test
```

```
data:  coa$Region.of.Stay and coa$i..Washing.hands.regularly.with.soap.han
d.wash
X-squared = 49.262, df = 12, p-value = 1.882e-06
```

Interpretation:
#as p-value less than 0.05, we reject null hypotheis
#So location of stay has impact on people washing hand regularly.

Q.2 If there is any decrease in buying food from outside for male population than female?

Chi-square test: there are two categorical independent variable

Null hypothesis: Gender does not have any significant effect on buying food from outside

Alternative hypothesis: Gender has effect on buying food from outside

chisq.test(coa$Gender,coa$iii..Food.delivery.takeaway.Zomato..Swiggy.)
Output:
```
> chisq.test(coa$Gender,coa$iii..Food.delivery.takeaway.Zomato..Swiggy.)

        Pearson's Chi-squared test

data:  coa$Gender and coa$iii..Food.delivery.takeaway.Zomato..Swiggy.
X-squared = 17.211, df = 8, p-value = 0.02798
```

Interpretation:
As p-value less than 0.05, we reject null hypothesis

To understand better if there is any decrease in buying food from outside for male population than female, we use histogram

par(mfrow=c(1,2))
hist(coa$iii..Food.delivery.takeaway.Zomato..Swiggy.[coa$Gender==1])
hist(coa$iii..Food.delivery.takeaway.Zomato..Swiggy.[coa$Gender==2])
Output:
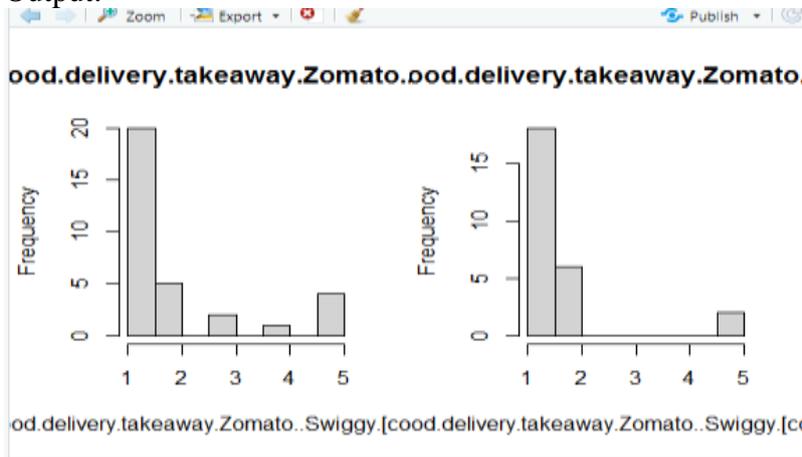
#so, we clearly understand from histogram that there is decrease in buying food from outside for male population than female.

Q.3 Are people of India concerned about spread of covid 19 in their localities?

Chi-square test: there are two categorical independent variable

Null hypothesis: people of India are not concerned about spread of covid 19

Alternative: people of India are concerned about spread of covid 19

chisq.test(coa$Region.of.Stay,coa$How.concerned.are.you.about.the.spread.of.COVID.19..Coronavirus..in.India)

Output:

```
> chisq.test(coa$Region.of.Stay,coa$How.concerned.are.you.about.the.spread
.of.COVID.19..Coronavirus..in.India)

        Pearson's Chi-squared test

data:  coa$Region.of.Stay and coa$How.concerned.are.you.about.the.spread.o
f.COVID.19..Coronavirus..in.India
X-squared = 53.89, df = 12, p-value = 2.86e-07
```

Interpretation:
#as p-value<0.05, we reject null hypothesis
#so, people are concerned with spread of covid 19

Q4. Are people of India avoiding social gathering or crowded place?

Chi-square test: there are two categorical independent variable

<u>*Null hypothesis*</u>*: people are not avoiding social gathering*

<u>*Alternative hypothesis*</u>*: people are avoiding social gathering*

chisq.test(coa$Region.of.Stay,coa$v..Avoiding.social.gatherings.or.crowded.places)

Output:

```
> chisq.test(coa$Region.of.Stay,coa$v..Avoiding.social.gatherings.or.crowd
ed.places)

        Pearson's Chi-squared test

data:  coa$Region.of.Stay and coa$v..Avoiding.social.gatherings.or.crowded
.places
X-squared = 65.512, df = 12, p-value = 2.192e-09
```

Interpretation:
As p-value<0.05, we reject null hypothesis
#so, people from different region are avoiding social gathering

Q5. Does location has an impact on safety concern adopted by people?

Chi-square test: there are two categorical independent variable:

<u>*Null Hypothesis Testing*</u>*- location does not have any significance difference in taking Safety concerns in buying products from stores/shops*

Alternative Hypothesis Testing- location does have any significance difference in taking Safety concerns in buying products from stores/shops

chisq.test(coa$i..Safety.concerns.in.buying.products.from.stores.shops, coa$Region.of.Stay)

Output:
```
> chisq.test(coa$i..Safety.concerns.in.buying.products.from.stores.shops,
coa$Region.of.Stay)

        Pearson's Chi-squared test

data:  coa$i..Safety.concerns.in.buying.products.from.stores.shops and coa
$Region.of.Stay
X-squared = 64.279, df = 16, p-value = 9.799e-08
```

Interpretation:

P-value = 9.799e-08, since the p value is less than 0.05 we reject the null hypothesis

Q6. Does large business/corporation will be effected according to region of stay

Chi-square test: there are two categorical independent variable

Null Hypothesis Testing- Large business/corporation will not be effected according to region of stay

Alternative Hypothesis Testing- Large business/corporation will be effected according to region of stay

chisq.test(coa$i..Large.business.corporation.will.be.affected, coa$Region.of.Stay)

Output:
```
> chisq.test(coa$i..Large.business.corporation.will.be.affected, coa$Regio
n.of.Stay)

        Pearson's Chi-squared test

data:  coa$i..Large.business.corporation.will.be.affected and coa$Region.o
f.Stay
X-squared = 44.668, df = 16, p-value = 0.000156
```

Interpretation:
P-value = 0.000156, since the p value is less than 0.05 we reject the null hypothesis

Q7. Does gender have an effect on unemployment in the pandemic situation?

Chi-square test: there are two categorical independent variable

Null Hypothesis Testing- gender does not have a significant effect on unemployment in the pandemic situation

Alternative Hypothesis Testing- gender does have a significant effect on unemployment in the pandemic situation

chisq.test(coa$iii..Unemployment.is.likely.to.increase, coa$Gender)

Output:
```
> chisq.test(coa$iii..Unemployment.is.likely.to.increase, coa$Gender)

        Pearson's Chi-squared test

data:  coa$iii..Unemployment.is.likely.to.increase and coa$Gender
X-squared = 36.208, df = 8, p-value = 1.609e-05
```

Interpretation:
P-value = 1.609e-05, since the p value is less than 0.05 we reject the null hypothesis

Q8. Does Small business/corporation will be effected according to region of stay?

Chi-square test: there are two categorical independent variable

Null Hypothesis Testing- Small business/corporation will not be effected according to region of stay

Alternative Hypothesis Testing- Small business/corporation will be effected according to region of stay

chisq.test(coa$v..Small.business.corporation.will.be.affected, coa$Region.of.Stay)

Output:
```
> chisq.test(coa$v..Small.business.corporation.will.be.affected, coa$Regio
n.of.Stay)

        Pearson's Chi-squared test

data:  coa$v..Small.business.corporation.will.be.affected and coa$Region.o
f.Stay
X-squared = 37.355, df = 16, p-value = 0.001868
```

Interpretation:
P-value = 0.001868, since the p value is less than 0.05 we reject the null hypothesis

Q9. Is there a change in use of digital payment apps by men and women in last 10-15 days?

Chi-square test: there are two categorical independent variable

Null Hypothesis Testing- There is significant change in use digital payment apps (like paytm, google pay, amazon pay etc.) in the last 10-15 days by men and women.

Alternative Hypothesis Testing- There is no significant change in use digital payment apps (like Paytm, google pay, amazon pay etc.) in the last 10-15 days by men and women.

chisq.test(coa$How.has.your.use.digital.payment.apps..like.paytm..google.pay..amazon.pay.etc...changed.in.the.last.10.15.days., coa$Gender)

Output:
```
> chisq.test(coa$How.has.your.use.digital.payment.apps..like.paytm..google
.pay..amazon.pay.etc...changed.in.the.last.10.15.days., coa$Gender)

        Pearson's Chi-squared test

data:  coa$How.has.your.use.digital.payment.apps..like.paytm..google.pay..
amazon.pay.etc...changed.in.the.last.10.15.days. and coa$Gender
X-squared = 8.6643, df = 8, p-value = 0.3714
```

Interpretation:
P-value = 0.3714 i.e p>0.05, so we accept null hypothesis
#Thus there is a significant increase of people using digital payment methods during COVID crisis.

boxplot(coa$How.has.your.use.digital.payment.apps..like.paytm..google.pay..amazon.pay.etc...changed.in.the.last.10.15.days., coa$Gender) #1=increased 2=decreased

Output:
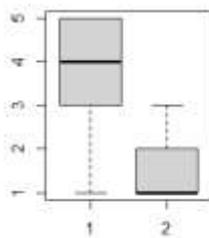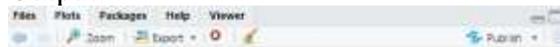
From the boxplot also, we can see that using digital payment apps have increased.

Q10 .Does location of stay has impact on people availing out of home entertainment facilities?

Chi-square test: there are two categorical independent variable

Null Hypothesis Testing- There is decrease in comparison to pre COVID crisis in Out of home entertainment (movies, pubs, restaurant etc.) based on region of stay

Alternative Hypothesis Testing- There is no significant change for out of home entertainment based on region of stay.

chisq.test(coa$ii..Out.of.home.entertainment.movies.pubs..restaurant.etc.., coa$Region.of.Stay)

Output:
```
> chisq.test(coa$ii..Out.of.home.entertainment.movies.pubs..restaurant.etc
.., coa$Region.of.Stay)
```

```
      Pearson's Chi-squared test
```

data: coa$ii..Out.of.home.entertainment.movies.pubs..restaurant.etc.. and
coa$Region.of.Stay
X-squared = 12.859, df = 16, p-value = 0.683

Interpretation:
P-value = 0.683 i.e p>0.05, so we accept null hypothesis

Thus there is a significant change of people availing out of home entertainment facilities, i.e - it has decreased.

boxplot(coa$ii..Out.of.home.entertainment.movies.pubs..restaurant.etc.., coa$Region.of.Stay)
#1=increased 2=decreased
Output:
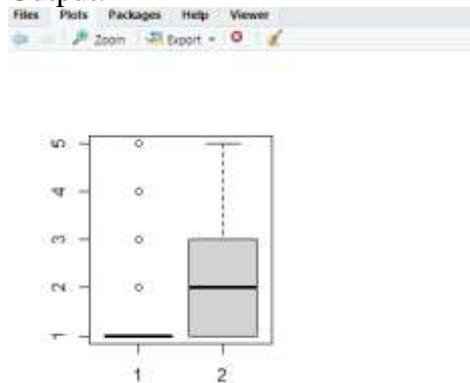
From the boxplot also, we can see that availing outside services have decreased.

Q11. Does location of stay has impact on people availing food delivery options?

Null Hypothesis Testing- There is no change in comparison to pre COVID crisis based on location of stay

Alternative Hypothesis Testing- There is a significant decrease in Food delivery/takeaway (Zomato, Swiggy) comparison to pre COVID crisis

Chi-square test: there are two categorical independent variable

chisq.test(coa$iii..Food.delivery.takeaway.Zomato..Swiggy., coa$Region.of.Stay)

Output:
```
> chisq.test(coa$iii..Food.delivery.takeaway.Zomato..Swiggy., coa$Region.o
f.Stay)

        Pearson's Chi-squared test
```

data: coa$iii..Food.delivery.takeaway.Zomato..Swiggy. and coa$Region.of.S
tay
X-squared = 35.317, df = 16, p-value = 0.003596

Interpretation:
P-value = 0.003596 i.e p<0.05, so we fail to accept null hypothesis

#Thus there is a significant change of people availing food delivery options, i.e - it has decreased.

boxplot(coa$iii..Food.delivery.takeaway.Zomato..Swiggy., coa$Region.of.Stay)
#1=increased 2=decreased
Output:
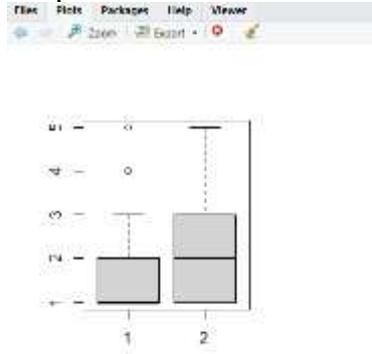
From the boxplot also, we can see that availing outside food services have decreased.

Q12. Is there a difference in travel by gender in comparison to pre-Covid crisis?

Null Hypothesis Testing- *There is no change in comparison to pre COVID crisis in Travel (Road, Rail and Air) in comparison to pre COVID crisis*

Alternative Hypothesis Testing- *There is significant decrease in travel (Road, Rail and Air)*

Chi-square test: there are two categorical independent variable

chisq.test(coa$vii..Travel..Road..Rail..Air., coa$Gender)

Output:
```
> chisq.test(coa$vii..Travel..Road..Rail..Air., coa$Gender)

        Pearson's Chi-squared test

data:  coa$vii..Travel..Road..Rail..Air. and coa$Gender
X-squared = 33.627, df = 8, p-value = 4.746e-05
```

Interpretation:
P-value = 4.746e-05 i.e p<0.05, so we fail to accept null hypothesis
#Thus there is a significant decrease of people travelling right now.

boxplot(coa$vii..Travel..Road..Rail..Air., coa$Gender) #1=increased 2=decreased
Output:
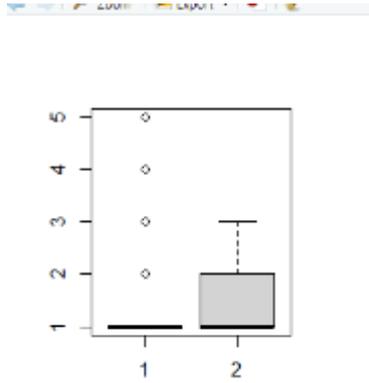
From the boxplot also, we can see that air travel has decreased.

Conclusion:

This report has discussed the COVID19 awareness of people and impact of lifestyle and various sectors of the economy in the pandemic situation. The objectives of this research survey to understand the awareness of people about COVID-19 impact on their lifestyles and their views on how the economy and various sectors of the society will be affected by the pandemic.

The objective was met by adopting an exploratory research study for our findings via Google form survey to have a better understanding of the pre- COVID-19 and existing lifestyles of people, this report includes interpretation of the result, including the new findings from the research, with proven hypothesis testing and data interpretation results, the result does support the hypothesis.

Finally, the overall significance of the project is to understand the awareness of people and impact of lifestyle and various sectors of the economy in the pandemic situation and as stated in the hypothesis that there will significance change in future.

Impact of Demographic Factors on Employee Engagement

Submitted By-
Prachet Kulkarni (PG19066)
Anirban Dasgupta (PG19016)
Riya Ganguly (PG19102)

```
library(readr)

## Warning: package 'readr' was built under R version 4.0.2

res=read.csv("Research.csv")

str(res)

## 'data.frame':    106 obs. of  26 variables:
##  $ Timestamp
: chr  "2020/07/07 11:36:45 PM GMT+5:30" "2020/07/07 11:36:56 PM GMT+5:30" "2
020/07/07 11:50:26 PM GMT+5:30" "2020/07/07 11:51:25 PM GMT+5:30" ...
##  $ Name
: chr  "Gauri" "Prabhat Joshi" "" "Bhanu Partap Bali" ...
##  $ Age
: int  22 25 22 25 25 23 18 27 18 24 ...
##  $ Gender
: chr  "Female" "Male" "Male" "Male" ...
##  $ Occupation
: chr  "Students" "Students" "Employed" "Employed" ...
##  $ What.is.important.for.you.for.Employee.Engagement...Communication.
: chr  "Agree" "Strongly Agree" "Strongly Agree" "Strongly Agree" ...
##  $ What.is.important.for.you.for.Employee.Engagement...Potentiality.
: chr  "Agree" "Strongly Agree" "Agree" "Strongly Agree" ...
```

```
##  $ What.is.important.for.you.for.Employee.Engagement...Team.Work.
: chr  "Agree" "Strongly Agree" "Agree" "Strongly Agree" ...
##  $ What.kind.of.feedback.does.the.company.follow.to.keep.the.employeesâ...
motivation.towards.the.work...Formal.Feedback.      : chr  "Agree" "Strongly
Agree" "Agree" "Strongly Agree" ...
##  $ What.kind.of.feedback.does.the.company.follow.to.keep.the.employeesâ...
motivation.towards.the.work...Informal.Feedback.    : chr  "Strongly Agree" "
Agree" "Neutral" "Neutral" ...
##  $ What.kind.of.feedback.does.the.company.follow.to.keep.the.employeesâ...
motivation.towards.the.work...Coaching.Feedback.    : chr  "Agree" "Strongly
Agree" "Agree" "Disagree" ...
##  $ Who.are.more.into.motivating.employees.towards.the.work...Managers.
: chr  "Agree" "Strongly Agree" "Agree" "Agree" ...
##  $ Who.are.more.into.motivating.employees.towards.the.work...Team.Leaders.
: chr  "Neutral" "Strongly Agree" "Agree" "Strongly Agree" ...
##  $ Who.are.more.into.motivating.employees.towards.the.work...Customers.
: chr  "Strongly Agree" "Agree" "Neutral" "Disagree" ...
##  $ What.kind.of.Employee.Engagement.programs.do.most.of.the.companies.foll
ow...Celebrating.Culture.                           : chr  "Neutral" "Agree"
"Agree" "Strongly Agree" ...
##  $ What.kind.of.Employee.Engagement.programs.do.most.of.the.companies.foll
ow...Annual.Programs.including.Families.            : chr  "Agree" "Neutral"
"Agree" "Strongly Agree" ...
##  $ What.kind.of.Employee.Engagement.programs.do.most.of.the.companies.foll
ow...Seminars.Webinars.                             : chr  "Strongly Agree" "
Strongly Agree" "Agree" "Neutral" ...
##  $ What.type.of.employee.benefits.do.most.of.the.organizations.follow.to.m
ake.the.employees.more.effective.towards.their.work.: chr  "Cafeteria Approac
h;Engagement" "Skill Based;Engagement" "Cafeteria Approach" "Skill Based" ...
##  $ Problems.faced.during.employee.engagement..Remote.working.
: chr  "Agree" "Agree" "Agree" "Agree" ...
##  $ Problems.faced.during.employee.engagement..Less.use.of.Skill.
: chr  "Neutral" "Agree" "Neutral" "Agree" ...
##  $ Problems.faced.during.employee.engagement..Disengagement.
: chr  "Agree" "Strongly Agree" "Agree" "Neutral" ...
##  $ Workplace.Culture.is.an.important.factor.affecting.the.Employee.Engagem
ent.                                                : chr  "Neutral" "Strongl
y agree" "Agree" "Strongly agree" ...
##  $ Does.Brand.Name.affect.perception.towards.the.organisation.
: chr  "Yes" "Maybe" "Maybe" "Yes" ...
##  $ Do.you.feel.that.favoritism.has.any.effect.in.employee.engagement.
: chr  "Yes" "Yes" "Yes" "Yes" ...
##  $ If.it.is.YES.to.the.above.question..do.you.feel.that.it.is.an.issue.for
.the.organisation.                                  : chr  "I do, as it creat
es a negative environment in the organisation" "I do, as it creates a negativ
e environment in the organisation" "I do, as it creates a negative environmen
t in the organisation" "I do, as it creates a negative environment in the org
anisation" ...
##  $ Is.motivation.the.same.now.as.it.was.pre.Covid.19
: chr  "Maybe" "No" "Yes" "No" ...
```

```
summary(res)
```

```
##    Timestamp              Name                Age              Gender
##   Length:106          Length:106        Min.   :18.00    Length:106
##   Class :character    Class :character  1st Qu.:25.00    Class :character
##   Mode  :character    Mode  :character  Median :38.00    Mode  :character
##                                         Mean   :37.17
##                                         3rd Qu.:47.00
##                                         Max.   :69.00
##    Occupation
##   Length:106
##   Class :character
##   Mode  :character
##
##
##
##   What.is.important.for.you.for.Employee.Engagement...Communication.
##   Length:106
##   Class :character
##   Mode  :character
##
##
##
##   What.is.important.for.you.for.Employee.Engagement...Potentiality.
##   Length:106
##   Class :character
##   Mode  :character
##
##
##
##   What.is.important.for.you.for.Employee.Engagement...Team.Work.
##   Length:106
##   Class :character
##   Mode  :character
##
##
##
##   What.kind.of.feedback.does.the.company.follow.to.keep.the.employeesâ...mo
tivation.towards.the.work...Formal.Feedback.
##   Length:106
##   Class :character
##   Mode  :character
##
##
##
##   What.kind.of.feedback.does.the.company.follow.to.keep.the.employeesâ...mo
tivation.towards.the.work...Informal.Feedback.
##   Length:106
##   Class :character
##   Mode  :character
```

```
##
##
##
##   What.kind.of.feedback.does.the.company.follow.to.keep.the.employeesâ...mo
tivation.towards.the.work...Coaching.Feedback.
##   Length:106
##   Class :character
##   Mode  :character
##
##
##
##   Who.are.more.into.motivating.employees.towards.the.work...Managers.
##   Length:106
##   Class :character
##   Mode  :character
##
##
##
##   Who.are.more.into.motivating.employees.towards.the.work...Team.Leaders.
##   Length:106
##   Class :character
##   Mode  :character
##
##
##
##   Who.are.more.into.motivating.employees.towards.the.work...Customers.
##   Length:106
##   Class :character
##   Mode  :character
##
##
##
##   What.kind.of.Employee.Engagement.programs.do.most.of.the.companies.follow
...Celebrating.Culture.
##   Length:106
##   Class :character
##   Mode  :character
##
##
##
##   What.kind.of.Employee.Engagement.programs.do.most.of.the.companies.follow
...Annual.Programs.including.Families.
##   Length:106
##   Class :character
##   Mode  :character
##
##
##
##   What.kind.of.Employee.Engagement.programs.do.most.of.the.companies.follow
...Seminars.Webinars.
```

```
##    Length:106
##    Class :character
##    Mode  :character
##
##
##
##    What.type.of.employee.benefits.do.most.of.the.organizations.follow.to.mak
e.the.employees.more.effective.towards.their.work.
##    Length:106
##    Class :character
##    Mode  :character
##
##
##
##    Problems.faced.during.employee.engagement..Remote.working.
##    Length:106
##    Class :character
##    Mode  :character
##
##
##
##    Problems.faced.during.employee.engagement..Less.use.of.Skill.
##    Length:106
##    Class :character
##    Mode  :character
##
##
##
##    Problems.faced.during.employee.engagement..Disengagement.
##    Length:106
##    Class :character
##    Mode  :character
##
##
##
##    Workplace.Culture.is.an.important.factor.affecting.the.Employee.Engagemen
t.
##    Length:106
##    Class :character
##    Mode  :character
##
##
##
##    Does.Brand.Name.affect.perception.towards.the.organisation.
##    Length:106
##    Class :character
##    Mode  :character
##
##
##
```

```
##   Do.you.feel.that.favoritism.has.any.effect.in.employee.engagement.
##   Length:106
##   Class :character
##   Mode  :character
##
##
##
##   If.it.is.YES.to.the.above.question..do.you.feel.that.it.is.an.issue.for.t
he.organisation.
##   Length:106
##   Class :character
##   Mode  :character
##
##
##
##   Is.motivation.the.same.now.as.it.was.pre.Covid.19
##   Length:106
##   Class :character
##   Mode  :character
##
##
##
```

```
nrow(res)
```

```
## [1] 106
```

```
ncol(res)
```

```
## [1] 26
```

#Introduction

Humans are the most vital resource of any organisation. Effective management of them has a major impact on the success of any organisation. Thus, to get the maximum output from any employee, it is essential to engage them efficiently towards their jobs.

There are many factors which forms as different aspects of employee engagement. Now due to the volatile and unpredictable nature of humans, we can never generalize the impact of any factor over a group of employees. Our study thus strives to understand the impact of demographic factors over the different aspects of employee engagement, to understand the perspective of each individual in regards to the factors and to understand, whether the demographic factor of any individual affects the aspects of employee engagement from a holistic viewpoint.

#Hypothesis

Here we will take the general hypothesis which would be further categorized with regards to further questions; all trying to focus on one objective that whether Demographic Factors have Impact on Employee Engagement.

Null Hypothesis : There is no Impact of Demographic Factors on Employee Engagement. Alternate Hypothesis : There is an Impact of Demographic Factors on Employee Engagement.

#Interpretation

#Null Hypothesis : There is no significant impact of Age on Communication, Potentiality and Team Work which affects the Employee Engagement #Alternate Hypothesis : There is a significant impact of Age on Communication, Potentiality and Team Work which affects the Employee Engagement #Using Multi ANOVA

```
anv.aov<- aov(res$Age~res$What.is.important.for.you.for.Employee.Engagement..
.Communication.+res$What.is.important.for.you.for.Employee.Engagement...Poten
tiality.+res$What.is.important.for.you.for.Employee.Engagement...Team.Work.)
summary(anv.aov)

##                                                                     Df
## res$What.is.important.for.you.for.Employee.Engagement...Communication.  3
## res$What.is.important.for.you.for.Employee.Engagement...Potentiality.   4
## res$What.is.important.for.you.for.Employee.Engagement...Team.Work.      3
## Residuals                                                              95
##                                                                    Sum
Sq
## res$What.is.important.for.you.for.Employee.Engagement...Communication.
683
## res$What.is.important.for.you.for.Employee.Engagement...Potentiality.
202
## res$What.is.important.for.you.for.Employee.Engagement...Team.Work.
271
## Residuals                                                             16
030
##                                                                    Mea
n Sq
## res$What.is.important.for.you.for.Employee.Engagement...Communication.  22
7.83
## res$What.is.important.for.you.for.Employee.Engagement...Potentiality.    5
0.55
## res$What.is.important.for.you.for.Employee.Engagement...Team.Work.       9
0.36
## Residuals                                                             16
8.74
##                                                                    F v
alue
## res$What.is.important.for.you.for.Employee.Engagement...Communication.   1
.350
## res$What.is.important.for.you.for.Employee.Engagement...Potentiality.    0
.300
## res$What.is.important.for.you.for.Employee.Engagement...Team.Work.       0
.536
```

```
## Residuals
##                                                                    Pr(
>F)
## res$What.is.important.for.you.for.Employee.Engagement...Communication.  0.
263
## res$What.is.important.for.you.for.Employee.Engagement...Potentiality.   0.
878
## res$What.is.important.for.you.for.Employee.Engagement...Team.Work.      0.
659
## Residuals
```

#Since p value is greater than 0.05 therefore we accept the null hypothesis #Hence there is no significant impact of Age on Communication,Potentiality and Team Work which affects the Employee Engagement

#Null Hypothesis: There is no significant impact of Age on considering that managers/team leaders/customers motivate employees towards their work #Alternate hypothesis: There is a significant impact of Age on considering that managers/team leaders/customers motivate employees towards their work #Using Multi ANOVA

```
anv3<- aov(res$Age~res$Who.are.more.into.motivating.employees.towards.the.wor
k...Managers.+res$Who.are.more.into.motivating.employees.towards.the.work...T
eam.Leaders.+res$Who.are.more.into.motivating.employees.towards.the.work...Cu
stomers.,data=res)
summary(anv3)

##
Df
## res$Who.are.more.into.motivating.employees.towards.the.work...Managers.
4
## res$Who.are.more.into.motivating.employees.towards.the.work...Team.Leaders
.  3
## res$Who.are.more.into.motivating.employees.towards.the.work...Customers.
4
## Residuals
94
##
Sum Sq
## res$Who.are.more.into.motivating.employees.towards.the.work...Managers.
482
## res$Who.are.more.into.motivating.employees.towards.the.work...Team.Leaders
.    257
## res$Who.are.more.into.motivating.employees.towards.the.work...Customers.
1486
## Residuals
14962
##
Mean Sq
## res$Who.are.more.into.motivating.employees.towards.the.work...Managers.
```

```
120.6
## res$Who.are.more.into.motivating.employees.towards.the.work...Team.Leaders
.    85.5
## res$Who.are.more.into.motivating.employees.towards.the.work...Customers.
371.4
## Residuals
159.2
##
F value
## res$Who.are.more.into.motivating.employees.towards.the.work...Managers.
0.758
## res$Who.are.more.into.motivating.employees.towards.the.work...Team.Leaders
.    0.537
## res$Who.are.more.into.motivating.employees.towards.the.work...Customers.
2.333
## Residuals
##
Pr(>F)
## res$Who.are.more.into.motivating.employees.towards.the.work...Managers.
0.5555
## res$Who.are.more.into.motivating.employees.towards.the.work...Team.Leaders
. 0.6578
## res$Who.are.more.into.motivating.employees.towards.the.work...Customers.
0.0613
## Residuals
##
## res$Who.are.more.into.motivating.employees.towards.the.work...Managers.
## res$Who.are.more.into.motivating.employees.towards.the.work...Team.Leaders
.
## res$Who.are.more.into.motivating.employees.towards.the.work...Customers.
.
## Residuals
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

#Since p value is greater than 0.05 therefore we accept the null hypothesis #Hence there is no significant impact of Age on considering that managers/team leaders/customers motivate employees towards their work

#Null Hypothesis : There is no significant impact of occupation on Celebrating Culture which affects the Employee Engagement #Alternate Hypothesis : There is a significant impact of Occupation on Celebrating Culture which affects the Employee Engagement

```
chisq.test(res$Occupation,res$What.kind.of.Employee.Engagement.programs.do.mo
st.of.the.companies.follow...Celebrating.Culture.)

## Warning in chisq.test(res$Occupation,
## res$What.kind.of.Employee.Engagement.programs.do.most.of.the.companies.fol
```

```
low...Celebrating.Culture.):
## Chi-squared approximation may be incorrect


##
##  Pearson's Chi-squared test
##
## data:  res$Occupation and res$What.kind.of.Employee.Engagement.programs.do
.most.of.the.companies.follow...Celebrating.Culture.
## X-squared = 11.178, df = 8, p-value = 0.1918
```

#Since p value is greater than 0.05 therefore we accept the null hypothesis

#Null Hypothesis : There is no significant impact of occupation on Annual Programs which affects the Employee Engagement #Alternate Hypothesis : There is a significant impact of Occupation on Annual programs which affects the Employee Engagement

```
chisq.test(res$Occupation,res$What.kind.of.Employee.Engagement.programs.do.mo
st.of.the.companies.follow...Annual.Programs.including.Families.)

## Warning in chisq.test(res$Occupation,
## res$What.kind.of.Employee.Engagement.programs.do.most.of.the.companies.fol
low...Annual.Programs.including.Families.):
## Chi-squared approximation may be incorrect


##
##  Pearson's Chi-squared test
##
## data:  res$Occupation and res$What.kind.of.Employee.Engagement.programs.do
.most.of.the.companies.follow...Annual.Programs.including.Families.
## X-squared = 8.7605, df = 8, p-value = 0.3629
```

#Since p value is greater than 0.05 therefore we accept the null hypothesis

#Null Hypothesis : There is no significant impact of occupation on Seminar/Webinars which affects the Employee Engagement #Alternate Hypothesis : There is a significant impact of Occupation on Seminar/Webinars which affects the Employee Engagement

```
chisq.test(res$Occupation,res$What.kind.of.Employee.Engagement.programs.do.mo
st.of.the.companies.follow...Seminars.Webinars.)

## Warning in chisq.test(res$Occupation,
## res$What.kind.of.Employee.Engagement.programs.do.most.of.the.companies.fol
low...Seminars.Webinars.):
## Chi-squared approximation may be incorrect


##
##  Pearson's Chi-squared test
##
## data:  res$Occupation and res$What.kind.of.Employee.Engagement.programs.do
.most.of.the.companies.follow...Seminars.Webinars.
## X-squared = 8.6656, df = 8, p-value = 0.3713
```

#Since p value is greater than 0.05 therefore we accept the null hypothesis

#Null Hypothesis : There is no significant impact of occupation on Employee benefits which affects the Employee Engagement #Alternate Hypothesis : There is a significant impact of Occupation on Employee benefits which affects the Employee Engagement

```
chisq.test(res$Occupation,res$What.type.of.employee.benefits.do.most.of.the.o
rganizations.follow.to.make.the.employees.more.effective.towards.their.work.)

## Warning in chisq.test(res$Occupation,
## res$What.type.of.employee.benefits.do.most.of.the.organizations.follow.to.
make.the.employees.more.effective.towards.their.work.):
## Chi-squared approximation may be incorrect

##
##  Pearson's Chi-squared test
##
## data:  res$Occupation and res$What.type.of.employee.benefits.do.most.of.th
e.organizations.follow.to.make.the.employees.more.effective.towards.their.wor
k.
## X-squared = 14.412, df = 24, p-value = 0.9368
```

#Since p value is greater than 0.05 therefore we accept the null hypothesis #Hence there no significant impact of occupation on Employee benefits which affects the Employee Engagement

#Null Hypothesis : Null hypothesis-There is no significant influence of age with regards to problems faced in remote working, less use of skill and disengagement #Alternate hypothesis– There is a significant influence of age with regards to problems faced in remote working, less use of skill and disengagement

```
anv6<- aov(res$Age~res$Problems.faced.during.employee.engagement..Remote.work
ing.+res$Problems.faced.during.employee.engagement..Less.use.of.Skill.+res$Pr
oblems.faced.during.employee.engagement..Disengagement.,data=res)
summary(anv6)

##                                                                   Df Sum S
q
## res$Problems.faced.during.employee.engagement..Remote.working.    4    13
0
## res$Problems.faced.during.employee.engagement..Less.use.of.Skill. 4   126
4
## res$Problems.faced.during.employee.engagement..Disengagement.     4    98
4
## Residuals                                                        93  1480
9
##                                                                   Mean Sq
## res$Problems.faced.during.employee.engagement..Remote.working.     32.39
## res$Problems.faced.during.employee.engagement..Less.use.of.Skill. 316.09
## res$Problems.faced.during.employee.engagement..Disengagement.     246.11
## Residuals                                                         159.23
```

```
##                                                                 F value
## res$Problems.faced.during.employee.engagement..Remote.working.   0.203
## res$Problems.faced.during.employee.engagement..Less.use.of.Skill. 1.985
## res$Problems.faced.during.employee.engagement..Disengagement.     1.546
## Residuals
##                                                                 Pr(>F)
## res$Problems.faced.during.employee.engagement..Remote.working.   0.936
## res$Problems.faced.during.employee.engagement..Less.use.of.Skill. 0.103
## res$Problems.faced.during.employee.engagement..Disengagement.     0.195
## Residuals
```

#Since p value is greater than 0.05 therefore we accept the null hypothesis #Hence there is no significant impact of age with regards to problems due to remote working, less use of skill and disengagement.

#Null Hypothesis : There is no significant impact of gender with regards to workplace culture affecting employee engagement #Alternate Hypothesis : There is a significant impact of gender with regards to workplace culture affecting employee engagement

```
chisq.test(res$Gender,res$Workplace.Culture.is.an.important.factor.affecting.
the.Employee.Engagement.)

## Warning in chisq.test(res$Gender,
## res$Workplace.Culture.is.an.important.factor.affecting.the.Employee.Engage
ment.):
## Chi-squared approximation may be incorrect

##
##   Pearson's Chi-squared test
##
## data:  res$Gender and res$Workplace.Culture.is.an.important.factor.affecti
ng.the.Employee.Engagement.
## X-squared = 1.9733, df = 2, p-value = 0.3728
```

#Since p value is greater than 0.05 therefore we accept the null hypothesis #Hence there is no significant impact of gender with regards to workplace culture affecting employee engagement

#Null Hypothesis : There is no significant impact of gender with regards to favouritism affecting employee engagement #Alternate Hypothesis : There is a significant impact of gender with regards to favourtism affecting employee engagement

```
chisq.test(res$Gender,res$Do.you.feel.that.favoritism.has.any.effect.in.emplo
yee.engagement.)

## Warning in chisq.test(res$Gender,
## res$Do.you.feel.that.favoritism.has.any.effect.in.employee.engagement.): C
hi-
## squared approximation may be incorrect
```

```
##
##   Pearson's Chi-squared test
##
## data:   res$Gender and res$Do.you.feel.that.favoritism.has.any.effect.in.em
ployee.engagement.
## X-squared = 2.6261, df = 2, p-value = 0.269
```

#Since p value is less than 0.05 therefore we accept the alternate hypothesis #Hence there is a significant impact of gender with regards to favourtism affecting employee engagement

#Null Hypothesis : There is no significant impact of age with regards to change in motivation due to Covid #Alternate Hypothesis : There is a significant impact of age with regards to change in motivation due to Covid

```
anv9<- aov(res$Age~res$Is.motivation.the.same.now.as.it.was.pre.Covid.19)
summary(anv9)
```

```
##                                                        Df Sum Sq Mean Sq
## res$Is.motivation.the.same.now.as.it.was.pre.Covid.19   2     87   43.42
## Residuals                                             103  17100  166.02
##                                                       F value Pr(>F)
## res$Is.motivation.the.same.now.as.it.was.pre.Covid.19   0.262   0.77
## Residuals
```

#Since p value is less than 0.05 therefore we accept the alternate hypothesis #Hence there is a significant impact of age with regards to change in motivation due to Covid

```
**Data Visualisation**
```

Here , we have represented Age along with problems faced during employee engagement in order to understand how different age people faced different problems in employee engagement which we represented in the form of histogram .On viewing our data, we saw that there is not one aspect that is relevant to only one age group; thus showing that any of the problem is relevant at any age level.

```
par(mfrow=c(3,1))
hist(table(res$Age,res$Problems.faced.during.employee.engagement..Less.use.of
.Skill.))
hist(table(res$Age,res$Problems.faced.during.employee.engagement..Disengageme
nt.))
hist(table(res$Age,res$Problems.faced.during.employee.engagement..Remote.work
ing.))
```

n of table(resAge, resProblems.faced.during.employee.engagement..Less

table(resAge, resProblems.faced.during.employee.engagement..Less.use.of.Skill.)

n of table(resAge, resProblems.faced.during.employee.engagement..Dise

table(resAge, resProblems.faced.during.employee.engagement..Disengagement.)
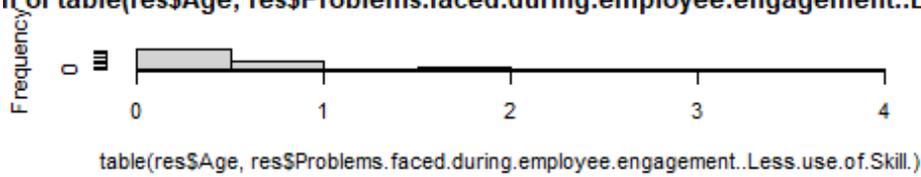
n of table(resAge, resProblems.faced.during.employee.engagement..Rem
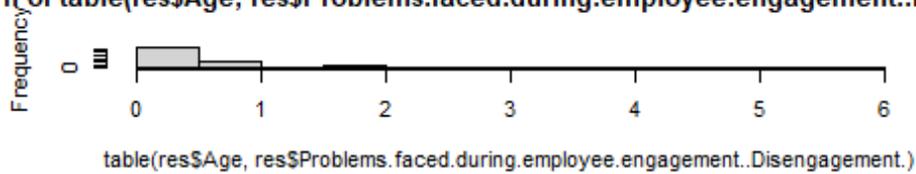
table(resAge, resProblems.faced.during.employee.engagement..Remote.working.)
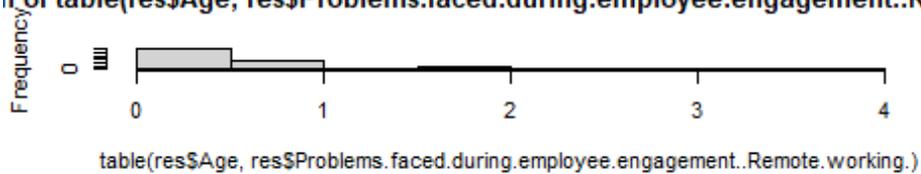
Here we can say that different people have different preference under workplace culture, which is independent of the gender of any employee

```
hist(table(res$Age,res$Workplace.Culture.is.an.important.factor.affecting.the
.Employee.Engagement.))
```

, res$Workplace.Culture.is.an.important.factor.affect
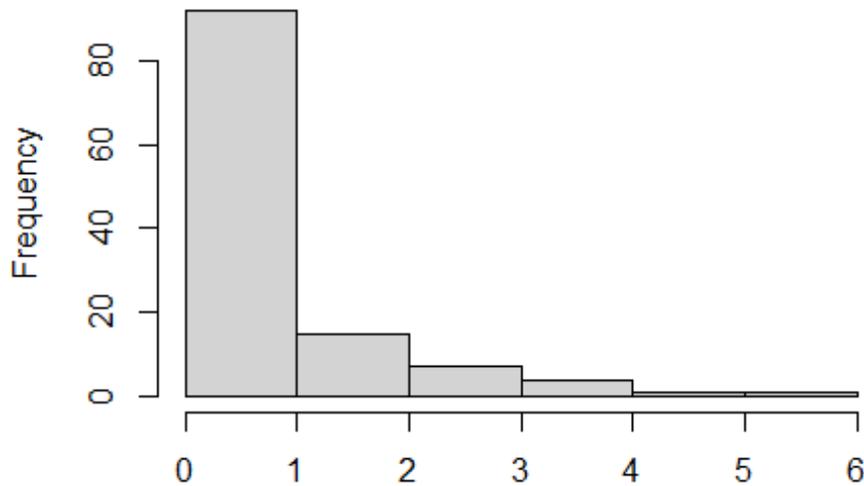
ge, res$Workplace.Culture.is.an.important.factor.affecting.the.Employ

Conclusion

We have taken 3 demographic factors into consideration, i.e age, gender and occupation and have tested it against various aspects of employee engagement; whether it is certain quality of employees like communication, potentiality, or the type of feedback that a company follows, or the people responsible for keeping the employees engaged, or the culture of the organisation, etc.

There are traditional speculations regarding some of the demographic factors with some aspects of employee engagements, e.g 1) Middle aged people are not fully engaged with remote working 2) Favouritism is gender biased thus disengaging certain employees 3)Organsiational culture is stringent to some specific occupations. These are just some of the many stigmas, that people already harbor, when they are joining or are already in employement. By establishing that there is no relation between the demographic factors and the aspects of employee engagement; it is evident that there are no bounds to which what aspect impacts the engagement of an employee. It all depends from employee to employee, all having an unique take upon the engagement factors that entices them, and nothing can be generalised, as people have been doing for so many ages. We hope that with this, we can break the common stigma that demographic factors affects the employees work life, resulting to an impact on their engagement. Efficient employee engagement is an essential part for any successful organisation, and it should be done while being based on the performance and needs of the employee, rather than the demographic factors surrounding such employees.

R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
summary(cars)
```

```
##      speed           dist
##  Min.   : 4.0    Min.   :  2.00
##  1st Qu.:12.0    1st Qu.: 26.00
##  Median :15.0    Median : 36.00
##  Mean   :15.4    Mean   : 42.98
##  3rd Qu.:19.0    3rd Qu.: 56.00
##  Max.   :25.0    Max.   :120.00
```

Including Plots

You can also embed plots, for example:

Note that the echo = FALSE parameter was added to the code chunk to prevent printing of the R code that generated the plot.

Distance Learning and Keeping Connection for Students During the Coronavirus Outbreak

Submitted By-
Richa Yaduka
Himaja Reddy Maddika
Lokesh Doda

Introduction:

In the wake of the coronavirus (COVID-19) pandemic, businesses, schools and colleges have had to dramatically shift on how they operate. In fact, nearly all students currently enrolled in higher education programs had in-person classes cancelled because of coronavirus (COVID-19).

Yet, the learning hasn't stopped; students are still being assigned coursework from home. We wanted to learn how this transition is going and what support students feel they need right now.

Methodology:

Quantitative analysis has been done by conducting various hypothesis testing. Data collection has been done by making use of questionnaire survey from 40 students with the help of Google form survey.

Hypothesis Testing:

- ANOVA Test (One numeric, one categorical for more than two levels)
- Chi Square Test: Test of independence (Two Categorical variables)

```
setwd("C:/Users/divya/Documents/R_2020")
Covid = read.csv("CovidDataCsv.csv")

str(Covid)
```

```
## 'data.frame': 31 obs. of 14 variables:
## $ Age : chr "23-26 years" "23-26 years" "19-22 ye ars" "23-26
years" ...
## $ Gender : chr "Female" "Male" "Male" "Male" ... ## $
Educational.Qualification : chr "Post Graduate" "Graduate" "Graduate"
"Post Graduate" ...
## $ Following.News : chr "YES" "YES" "YES" "YES" ... ## $
News.Sources : chr "News media;Influencers or celebritie s;Social
media;People you know" "Government health organizations;Newspaper;In
fluencers or celebrities;Social media;People you know" "Newspaper"
"News medi a;Government health organizations;Influencers or
celebrities;Social media" .. .
## $ Connecting.Ways : chr "Social media;Texts;Phone calls" "Soc ial
media;Video Chat;Phone calls;While playing online games like Dota PubG
VA lorant etc." "While playing online games like Dota PubG VAlorant
etc." "Socia l media;Video Chat;Texts;Phone calls;While playing online
games like Dota Pub
G VAlorant etc." ...
## $ Connection.with.Family : chr "Connected" "Connected" "Extremely
Co nnected" "Extremely Connected" ...
## $ College.Updates : chr "No" "No" "No" "Yes" ... ## $ Disruptive :
int 5 3 5 5 5 5 4 4 3 4 ... ## $ Preparation : int 4 3 2 2 4 3 3 4 1 3
... ## $ Concerns : chr "Losing contact with professors;Being
physically isolated from classmates" "Keeping up with coursework"
"Keeping up  with extracurricular activities" "Being physically
isolated from classmates;K eeping up with extracurricular activities"
...
## $ Connection.with.instructors: int 3 1 1 3 4 4 4 3 2 3 ... ## $
Student.Interraction : int 5 4 5 3 4 2 3 5 2 5 ... ## $ Real.virtual :
chr "Real classroom" "Real classroom" "Vi rtual Classroom" "Real
classroom" ...
```

summary(Covid)

```
## Age Gender Educational.Qualification ## Length:31
Length:31 Length:31
## Class :character Class :character Class :character
## Mode :character Mode :character Mode :character
##
##
##
## Following.News News.Sources Connecting.Ways
## Length:31 Length:31 Length:31
## Class :character Class :character Class :character
## Mode :character Mode :character Mode :character
##
##
##
## Connection.with.Family College.Updates Disruptive Preparation  ##
Length:31 Length:31 Min. :1.000 Min. :1.000  ## Class :character
Class :character 1st Qu.:3.500 1st Qu.:3.000  ## Mode :character Mode
:character Median :4.000 Median :3.000  ## Mean :4.065 Mean :3.194
## 3rd Qu.:5.000 3rd Qu.:4.000  ## Max. :5.000 Max. :5.000
## Concerns Connection.with.instructors Student.Interraction ##
Length:31 Min. :1.000 Min. :2.000  ## Class :character 1st
```

```
Qu.:2.000 1st Qu.:3.500  ## Mode :character Median :3.000
Median :4.000  ## Mean :2.968 Mean :3.968  ## 3rd Qu.:4.000 3rd
Qu.:5.000  ## Max. :5.000 Max. :5.000  ## Real.virtual
## Length:31
## Class :character
## Mode :character
##
##
##
```

```r
Gender = as.factor(c("Male","Female"))
Gender
```

```
## [1] Male Female
## Levels: Female Male
```

```r
x=factor(Gender,order=TRUE,levels = c("Male","Female") )
x
```

```
## [1] Male Female
## Levels: Male < Female
```

```r
Age=as.factor(c("15-18 years","19-22 years","23-26
years")) Age
```

```
## [1] 15-18 years 19-22 years 23-26 years
## Levels: 15-18 years 19-22 years 23-26 years
```

```r
z=factor(Age,order=TRUE,levels = c("15-18 years","19-22 years","23-26
years") )
z
```

```
## [1] 15-18 years 19-22 years 23-26 years
## Levels: 15-18 years < 19-22 years < 23-26 years
```

```r
levels(x)
```

```
## [1] "Male" "Female"
```

```r
class(x)
```

```
## [1] "ordered" "factor"
```

```r
EducationalQualification=as.factor(c("Under Graduate","Graduate",
"Post Gradu ate"))
EducationalQualification
```

```
## [1] Under Graduate Graduate Post Graduate
## Levels: Graduate Post Graduate Under Graduate
```

```r
y=factor(EducationalQualification, order= TRUE, levels = c("Under
Graduate"," Graduate", "Post Graduate"))
levels(y)
```

```
## [1] "Under Graduate" "Graduate" "Post Graduate"
```

```r
class(y)
```

```
## [1] "ordered" "factor"
```

```
y
## [1] Under Graduate Graduate Post Graduate
## Levels: Under Graduate < Graduate < Post Graduate
```

```r
Following=as.factor(c("YES","NO"))
Following
```

```
## [1] YES NO
## Levels: NO YES
```

```r
a=factor(Following,order=TRUE, levels=c("YES","NO"))
a
```

```
## [1] YES NO
## Levels: YES < NO
```

```r
levels(a)
```

```
## [1] "YES" "NO"
```

```r
class(a)
```

```
## [1] "ordered" "factor"
```

```r
ConnectionwithFamily=as.factor(c("Not Connected","Least Connected
","Neutral" ,"Connected","Highly Connected"))
ConnectionwithFamily
```

```
## [1] Not Connected Least Connected Neutral Connected  ##
[5] Highly Connected
## 5 Levels: Connected Highly Connected Least Connected ... Not Connected
```

```r
b=factor(ConnectionwithFamily,order=TRUE, levels = c("Not
Connected","Least C onnected ","Neutral","Connected","Highly
Connected"))
b
```

```
## [1] Not Connected Least Connected Neutral Connected  ##
[5] Highly Connected
## 5 Levels: Not Connected < Least Connected < Neutral < ... < Highly
Connec ted
```

```r
levels(b)
```

```
## [1] "Not Connected" "Least Connected " "Neutral" "Connected"  ##
[5] "Highly Connected"
```

```r
class(b)
```

```
## [1] "ordered" "factor"
```

```r
CollegeUpdates = as.factor(c("YES","NO"))
CollegeUpdates
```

```
## [1] YES NO
## Levels: NO YES
```

```
c=factor(CollegeUpdates,order=TRUE, levels =
c("YES","NO")) c
```

```
## [1] YES NO
## Levels: YES < NO
```

```
class(c)
```

```
## [1] "ordered" "factor"
```

```
levels(c)
```

```
## [1] "YES" "NO"
```

```
table(CollegeUpdates)
```

```
## CollegeUpdates
## NO YES
## 1 1
```

```
Disruptive= as.factor(c("Not disruptive at all","Not so
disruptive","Somewhat  disruptive","Very disruptive","Extremely
disruptive"))
Disruptive
```

```
## [1] Not disruptive at all Not so disruptive Somewhat
disruptive  ## [4] Very disruptive Extremely disruptive
  ## 5 Levels: Extremely disruptive Not disruptive at all ... Very
                            disruptive
```

```
d=factor(Disruptive,order=TRUE, levels = c("Not disruptive at
all","Not so di sruptive","Somewhat disruptive","Very
disruptive","Extremely disruptive")) class(d)
```

```
## [1] "ordered" "factor"
```

```
levels(d)
```

```
## [1] "Not disruptive at all" "Not so disruptive" "Somewhat
disruptive"  ## [4] "Very disruptive" "Extremely disruptive"
```

```
Preparation=as.factor(c("Not at all prepared","Not too
prepared","Somewhat pr epared", "Very prepared", "Extremely
prepared"))
Preparation
```

```
## [1] Not at all prepared Not too prepared Somewhat
prepared  ## [4] Very prepared Extremely prepared
## 5 Levels: Extremely prepared Not at all prepared ... Very prepared
```

```
e=factor(Preparation,order=TRUE, levels = c("Not at all prepared","Not
too pr epared","Somewhat prepared", "Very prepared", "Extremely
prepared")) class(e)
```

```
## [1] "ordered" "factor"
```

```
levels(e)
## [1] "Not at all prepared" "Not too prepared" "Somewhat
```

```
prepared"  ## [4] "Very prepared" "Extremely prepared"

Connectionwithinstructors=as.factor(c())
Connectionwithinstructors

## factor(0)
## Levels:

f=factor(Connectionwithinstructors,order=TRUE,levels
= c()) class(f)

## [1] "ordered" "factor"

levels(f)

## character(0)

StudentInterraction=as.factor(c("Not at all important","Not too
important","S omewhat important", "Very important", "Extremely
important")) StudentInterraction

## [1] Not at all important Not too important Somewhat
important  ## [4] Very important Extremely important
## 5 Levels: Extremely important Not at all important ... Very
important

g=factor(StudentInterraction,  order=  TRUE,  levels  =  c("Not  at  all
important", "Not too important","Somewhat important", "Very important",
"Extremely import ant"))
class(g)

## [1] "ordered" "factor"

levels(g)

## [1] "Not at all important" "Not too important" "Somewhat
important"  ## [4] "Very important" "Extremely important"

Real_virtual=as.factor(c("Real classroom", "Virtual
classroom")) Real_virtual

## [1] Real classroom Virtual classroom
## Levels: Real classroom Virtual classroom

h=factor(Real_virtual, order = TRUE,levels=c("Real classroom",
"Virtual class room"))
class(h)

## [1] "ordered" "factor"

levels(h)

## [1] "Real classroom" "Virtual classroom"
#1
#Does age affect the connection with family?
#Null Hypothesis: Age has no significant influence on connection with
family. #Alternate  Hypothesis:  Age  has  significant  influence  on
connection with famil y.
```

```
# Chi Square Test (Two Categorical variables)
chisq.test(Covid$Age,Covid$Connection.with.Family)

## Warning in chisq.test(Covid$Age, Covid$Connection.with.Family):
Chi-square d
## approximation may be incorrect


##
## Pearson's Chi-squared test
##
## data: Covid$Age and Covid$Connection.with.Family
## X-squared = 32.24, df = 8, p-value = 8.436e-05

# since p-value is less than 0.5 we reject null
Hypothesis  # Age has influence on connection with
family.
#2
#Does age affect the connection with instructors?
#Null Hypothesis: Age has no significant influence on connection with
instruc tors.
#Alternate Hypothesis: Age has significant influence on connection
with instr uctors.
# Chi Square Test (Two Categorical variables)
chisq.test(Covid$Age,Covid$Connection.with.instructors)

## Warning in chisq.test(Covid$Age,
Covid$Connection.with.instructors): Chi-s quared
## approximation may be incorrect


##
## Pearson's Chi-squared test
##
## data: Covid$Age and Covid$Connection.with.instructors
## X-squared = 5.735, df = 8, p-value = 0.6769

#since p-value is > 0.05 we accept Null Hypothesis
#Age does not have influence on connection with
Instructor #3
#Does preparation affect choosing of real_virtual class ?
#Null Hypothesis:Mental preparation for Distance learning has no
significant  influence on real_virtual classes.
#Alternate Hypothesis:Mental preparation for Distance learning has
significan t influence on real_virtual classes.
#Chi Square Test (Two Categorical variables)
chisq.test(Covid$Preparation,Covid$Real.virtual)
## Warning in chisq.test(Covid$Preparation, Covid$Real.virtual): Chi-
squared ## approximation may be incorrect


##
## Pearson's Chi-squared test
##
## data: Covid$Preparation and Covid$Real.virtual
## X-squared = 4.9122, df = 4, p-value = 0.2964

#since p-value is > 0.05 we accept Null Hypothesis
#Thus Mental preparation for Distance learning has no significant
```

```
influence o n real_virtual classes
#4
#Does student interaction impact connection with instructors?  #Null
Hypothesis: Student interaction has no significant impact on
connection  with instructors.
#Alternate Hypothesis: Student interaction has significant impact on
connecti on with instructors.
#Chi Square Test (Two Categorical variables)
chisq.test(Covid$Student.Interraction,Covid$Connection.with.instructor
s)
```

```
## Warning in chisq.test(Covid$Student.Interraction,
## Covid$Connection.with.instructors): Chi-squared approximation may
be incor rect
```

```
##
## Pearson's Chi-squared test
##
## data: Covid$Student.Interraction and
Covid$Connection.with.instructors ## X-squared = 13.227, df = 12,
p-value = 0.3528
```

```
#since p-value is > 0.05 we accept Null Hypothesis
#Student interaction has no significant impact on connection with
instructors #5
#How covid-19 disrupted traditional schooling impacted concerns to
students? #Null Hypothesis: Disruption in traditional schooling has
no significant impa ct on concerns of students.
#Alternate Hypothesis: Disruption in traditional schooling has
significant im pact on concerns of students.
#Chi Square Test (Two Categorical variables)
chisq.test(Covid$Disruptive,Covid$Concerns)
```

```
## Warning in chisq.test(Covid$Disruptive, Covid$Concerns): Chi-
squared ## approximation may be incorrect
```

```
##
## Pearson's Chi-squared test
##
## data: Covid$Disruptive and Covid$Concerns
## X-squared = 41.466, df = 40, p-value = 0.4066
#since p-value is > 0.05 we accept Null Hypothesis
#Disruption in traditional schooling has no significant impact on
concerns of  students.
#6
#Does gender affect student interaction?
#Null Hypothesis: Gender has no affect on student
interaction.  #Alternate Hypothesis: Gender has affect on
student interaction. #Chi Square Test (Two Categorical
variables)
chisq.test(Covid$Gender,Covid$Student.Interraction)
```

```
## Warning in chisq.test(Covid$Gender, Covid$Student.Interraction):
Chi-squar ed
## approximation may be incorrect
```

```
##
## Pearson's Chi-squared test
##
## data: Covid$Gender and Covid$Student.Interraction
## X-squared = 0.72674, df = 3, p-value = 0.8669
```

#since p-value is > 0.05 we accept Null Hypothesis
#Thus Gender has no affect on student interaction
#7
#Does connection with Family/friends affect the type of social
platform used? #Null Hypothesis: Connection with Family/friends has no
significant affect on the type of social platform used.
#Alternate Hypothesis: Connection with Family/friends has no
significant affe ct on the type of social platform used.
#Chi Square Test (Two Categorical variables)
chisq.test(Covid**$**Connection.with.Family,Covid**$**Connecting.Ways)

```
## Warning in chisq.test(Covid$Connection.with.Family,
 Covid$Connecting.Ways) : Chi-
## squared approximation may be incorrect
```

```
##
## Pearson's Chi-squared test
##
## data: Covid$Connection.with.Family and
Covid$Connecting.Ways ## X-squared = 60.36, df = 48, p-
value = 0.1086
```

#since p-value is > 0.05 we accept Null Hypothesis
#Thus Connection with Family/friends has no significant affect on the
type of social platform used.
#8
#Does age has an impact on how prepared students are for e-learning?
#Null Hypothesis: Age has no impact on how prepared students are for
e-learni ng.
#Alternate Hypothesis: Age has an impact on how prepared students are
for e-l earning.
#Chi Square Test (Two Categorical variables)
chisq.test(Covid**$**Age,Covid**$**Preparation)

```
## Warning in chisq.test(Covid$Age, Covid$Preparation): Chi-squared
approxima tion
## may be incorrect
```

```
##
## Pearson's Chi-squared test
##
## data: Covid$Age and Covid$Preparation
## X-squared = 14.521, df = 8, p-value = 0.06916
```

#since p-value is > 0.05 we accept Null Hypothesis
#Thus Age has no impact on how prepared students are for e-
learning #9
#Does college updates on COVID 19 depends on educational
qualification? #Null Hypothesis: College updates on COVID 19 does not
depend on educational qualification.

```
#Alternate Hypothesis: College updates on COVID 19 does not depend on
educati onal qualification.
#Chi Square Test (Two Categorical variables)
chisq.test(Covid$College.Updates,Covid$Educational.Qualification)

## Warning in chisq.test(Covid$College.Updates,
Covid$Educational.Qualificati on):
## Chi-squared approximation may be incorrect

##
## Pearson's Chi-squared test
##
## data: Covid$College.Updates and
Covid$Educational.Qualification ## X-squared = 0.84107, df
= 2, p-value = 0.6567

#since p-value is > 0.05 we accept Null Hypothesis
#Thus College updates on COVID 19 does not depend on educational
qualificatio n.
#10
#Does gender affect the type of news source?
#Null Hypothesis:Gender has no significant affect on news
source. #Alternate Hypothesis:Gender has no significant affect
on news source. Chi Square Test (Two Categorical variables)
chisq.test(Covid$Gender,Covid$News.Sources)

## Warning in chisq.test(Covid$Gender, Covid$News.Sources): Chi-
squared ## approximation may be incorrect

##
## Pearson's Chi-squared test
##
## data: Covid$Gender and Covid$News.Sources
## X-squared = 21.578, df = 17, p-value = 0.2015
#since p-value is > 0.05 we accept Null Hypothesis
#Thus Gender has no significant affect on news source.
```

Analysis

- Age has influence on connection with family
- Age does not have influence on connection with Instructor
- Thus Mental preparation for Distance learning has no significant influence on real_virtual classes
- Student interaction has no significant impact on connection with instructors
- Disruption in traditional schooling has no significant impact on concerns of students
- Thus Gender has no affect on student interaction
- Thus Connection with Family/friends has no significant affect on the type of social platform used
- Thus Age has no impact on how prepared students are for e learning
- Thus College updates on COVID 19 does not depend on educational   qualification
- Thus Gender has no significant affect on news source

Analysis of Risk of Heart Diseases

Submitted By-
Sanjana Kunjar
Vignesh Krishnamoorthy
Muthulakshmi Shunmugam

Introduction

In a fast-moving world, many fall prey to heart conditions that either makes life difficult or may even be fatal. The objective of the project is to help factor in our daily practices to help deduce how susceptible we are to heart diseases.

To help assist with the same, after consultation with an expert, we have taken into account 22 dimensions that have shown prominent influence over developing heart diseases. Taking this into account, we have created a questionnaire enquiring about the above mentioned 22 aspects of our study to the population under study.

A discrete safety limit exists for each of these dimensions, which when exceeded can put one at the risk of heart failure. An ideal case, where the person's practices falls under the permittable threshold, has been taken as our overall safety limit and this has been evaluated to be 27. Around 140 people have responded with their information, most of whom fall under the age category of 20 to 30 years. For every respondent, each aspect of their life is taken and evaluated relative to the safety limit and the cumulative value of all these risks is obtained.

Description:

Gender: 1= Male, 2= Female
Type of job: 1= Physically intensive, 2= Not physically intensive
Type of food: 1= Vegetarian, 2= Non-vegetarian
Eating out(weekly): 1= once , 2= Twice, 3= >twice
Weekly consumption of tobacco: 0=Not applicable, 1= once, 2= Twice, 3= more than

twice Hereditary factors: 1= Yes, 2= No, 3= Maybe

The output so obtained is used to do different analysis to answer common questions such as:

```r
getwd()
```

```
## [1] "C:/Users/Sanjana/Desktop/ISBR"
```

```r
setwd("C:/Users/Sanjana/Desktop/ISBR")
rhd=read.csv("Analysis of risk of heart diseases.csv")
```

```r
str(rhd)
## 'data.frame': 140 obs. of 48 variables:
## $ Name
 : chr "Manjeet Sarkar" "Manikanta" "Karthik S" "Srikar Burra"
... ## $ Age
 : int 22 23 23 23 27 23 23 24 22 23 ...
## $ Age.No
 : int 0 0 0 0 0 0 0 0 0 0 ...
## $ Gender
 : int 1 1 1 1 1 1 1 1 1 1 ...
## $ Gender.No
 : int 2 2 2 2 2 2 2 2 2 2 ...
## $ Marital.status
 : chr "Unmarried" "Unmarried" "Unmarried" "Unmarried" ...
## $ Type.of.job
 : int 2 2 1 2 2 2 2 2 2 2 ...
## $ Job.No
 : int 2 2 1 2 2 2 2 2 2 2 ...
## $ Working.hours
 : chr "< 5 hours" "< 5 hours" "10-12 hours" "8-10 hours"
... ## $ WH.No
 : int 1 1 5 4 3 1 3 2 4 3 ...
## $ Job.WH
 : int 2 2 5 8 6 2 6 4 8 6 ...
## $ I.am
 : int 2 2 2 1 2 2 2 2 2 2 ...
## $ Food.No
 : num 1.2 1.2 1.2 1 1.2 1.2 1.2 1.2 1.2 1.2 ...
##                                                                    $
Weekly.consumption.of.any.of.the.following..Ice.cream..Fat.yogurt..Butt
er..Baked.goods: chr "Occasionally" "> More than thrice" "Twice" "> More
tha n thrice" ...
## $ X
 : int 1 3 2 3 3 1 2 1 2 3 ...
## $ Weekly.consumption.of.pork..beef..goat.meat
 : chr "Occasionally" "More than thrice" "Thrice" "" ...
## $ X.1
 : int 1 3 3 0 2 3 1 1 1 0 ...
## $ How.many.times.a.week.do.you.eat.outside.
```

```
 : int 3 3 2 3 3 1 1 2 1 3 ...
## $ X.2
 : int 3 3 2 3 3 1 1 2 1 3 ...
## $ Weekly.consumption.of.carbonated.drinks
 : chr "> Twice" "> Twice" "> Twice" "> Twice" ...
## $ X.3
 : int 3 3 3 3 0 1 0 3 1 3 ...
## $
Do.you.take.your.three.meals.a.day.at.regular.intervals.   :
 chr "Sometimes" "Sometimes" "Sometimes" "Yes" ...
## $ X.4
 : int 1 1 1 0 2 2 1 0 1 2 ...
## $ Do.you.skip.breakfast.
 : chr "Yes" "Yes" "Sometimes" "Sometimes" ...
## $ X.5
 : int 2 2 1 1 2 1 2 1 1 1 ...
## $ Daily.hours.of.exercise
 : chr "None" "None" "30 minutes" "None" ...
## $ X.6
 : int 10 10 6 10 10 6 10 10 10 10 ...
## $ Weekly.consumption.of.tobacco
 : int 3 3 3 3 0 3 2 3 0 0 ...
## $ X.7
 : int 9 9 9 9 0 9 6 9 0 0 ...
## $ Weekly.consumption.of.alcohol
 : chr "Twice" "> Twice" "Occasionally" "Occasionally" ...
## $ X.8
 : int 6 9 3 3 0 9 3 3 3 3 ...
## $
Does.anyone.in.your.close.family.suffer.from.heart.conditions.   :
 int 1 2 1 1 2 2 2 2 1 2 ...
## $ X.9
 : int 5 0 5 5 0 0 0 0 5 0 ...
## $
Did.you.suffer.from.any.heart.related.ailments.in.the.past.   :
 chr "Yes" "No" "No" "No" ...
## $ X.10
 : int 5 0 0 0 0 0 0 0 0 0 ...
## $
Have.you.ever.felt.chest.pain.discomfort.or.shortness.of.breath.   :
 chr "Yes" "No" "Yes" "Yes" ...
## $ X.11
 : int 5 0 5 5 5 0 0 0 0 0 ...
## $
Have.you.ever.had.unexplainable.swelling.in.your.legs..hands.or.abdomen
 .. : chr "No" "No" "No" "No" ...
## $ X.12
 : int 0 0 0 0 0 0 0 0 0 0 ...
## $ Have.you.been.on.any.long.term.medications.for.the.following.   : chr
 "Anti-depressants, Blood-pressure" "None" "Cluster headache" "None" .. .
## $ X.13
 : int 5 0 2 0 0 0 0 0 0 5 ...
## $ M..sq
 : num 2.99 2.34 3.03 2.96 2.72 ...
```

```
## $ Weight..kgs.
 : num 60 87 76 63 79 90 71 95 49 57 ...
## $ BMI
 : num 20.1 37.2 25.1 21.3 29 ...
## $ X.14
 : int 0 10 8 0 8 10 8 10 5 0 ...
## $ Sleeping.hours
 : chr "5-9 hours" "5-9 hours" "5-9 hours" "5-9 hours" ...
## $ X.15
 : int 0 0 0 0 5 0 5 0 4 5 ...
## $ Total
 : num 61.2 58.2 58.2 53 49.2 48.2 48.2 47.2 45.2 44.2 ...
write.csv(rhd,"Analysis of risk of heart diseases.csv", row.names =
FALSE) View(rhd)
```

#1. Does gender affect risk of heart disease?

 # Null hypothesis H0: Gender does not influence the risk of Heart disease # Alternate hypothesis H1: Gender influences the risk of Heart disease

```
t.test(rhd$Gender~rhd$Total>27)
```

```
##
## Welch Two Sample t-test
##
## data: rhd$Gender by rhd$Total > 27
## t = 1.7363, df = 114.9, p-value = 0.08519
## alternative hypothesis: true difference in means is not equal
to 0 ## 95 percent confidence interval:
## -0.02095419 0.31857324
## sample estimates:
## mean in group FALSE mean in group TRUE
## 1.517857 1.369048
```

 # Since P value is greater than 0.05, we accept null hypothesis.   # Therefore gender influences risk of cardiac arrest.

```
table(rhd$Gender, rhd$Total>27)
```

```
##
## FALSE TRUE
## 1 27 53
## 2 29 31
```

 # the table shows that male has more risk of cardiac problems

#2. Are people in the age group of 25-35 healthier as compared to people of a ge >35?

```
colSums(table(rhd$Age, subset= rhd$Age %in% c(25:35), rhd$Total>27))
```

```
##
```

```
## subset FALSE TRUE
## FALSE 49 63
## TRUE 7 21
```

```r
colSums(table(rhd$Age, subset= rhd$Age %in% c(35:55), rhd$Total>27))
```

```
##
## subset FALSE TRUE
## FALSE 50 75
## TRUE 6 9
# 21 people in age group 25-35 are at a risk whereas 9 people in age
group # above 35 are at a risk of heart disease. Therefore, people >35
years of age # are comparatively healthier
```

```r
#3. Does being a vegetarian/non-vegetarian have a significant
influence # on risk of heart disease?

# Null Hypothesis H0: Being a vegetarian/non-vegetarian does not
have a # significant influence on risk of heart disease
# Alternate hypothesis H1: Being a vegetarian/non-vegetarian has a
significan t
# influence on risk of heart disease
# Since Veg/non-veg is categorical (2 levels) and total number is
numeric, # we use t.test
```

```r
t.test(rhd$I.am,rhd$Total[rhd$Total>27])
```

```
##
## Welch Two Sample t-test
##
## data: rhd$I.am and rhd$Total[rhd$Total > 27]
## t = -40.722, df = 83.382, p-value < 2.2e-16
## alternative hypothesis: true difference in means is not equal
to 0 ## 95 percent confidence interval:
## -35.52566 -32.21720
## sample estimates:
## mean of x mean of y
## 1.671429 35.542857
```

```r
# Since P value is lesser than 0.05, we fail to accept null hypothesis,
# Therefore, being a vegetarian/ non-vegetarian does not influence heart
dise ases

# 4. Does your nature of work affect your risk?

# Null hypothesis H0: Nature of work does not affect risk of heart
disease # Alternate hypothesis H1: Nature of work affects heart disease #
Since Nature of work is categorical (2 levels) and totals is numeric, we
us e t.test
```

```r
t.test(rhd$Type.of.job,rhd$Total>27)
```

```
##
## Welch Two Sample t-test
##
```

```
## data: rhd$Type.of.job and rhd$Total > 27
## t = 21.177, df = 272.47, p-value < 2.2e-16
## alternative hypothesis: true difference in means is not equal
to 0 ## 95 percent confidence interval:
## 1.056048 1.272523
## sample estimates:
## mean of x mean of y
## 1.764286 0.600000
```

```
# since p value is lesser than 0.05, we fail to accept null hypothesis, #
Therefore, nature of work- physically intensive/ not intensive affects
hear t disease
```

```
# 5. Does hereditary factors affect your risk of heart failure? # Null
Hypothesis H0: Hereditary factors have no influence on heart failure #
Alternate Hypothesis: Hereditary factors have an influence on heart
failure # Since Hereditary factors are categorical (3 levels) and totals
are numeric, # we use annova
```

```
anv1=aov(rhd$Does.anyone.in.your.close.family.suffer.from.heart.condition
s.~r hd$Total>27)
summary(anv1)
```

```
## Df Sum Sq Mean Sq F value Pr(>F)
## rhd$Total > 27 1 0.39 0.3857 1.209 0.273
## Residuals 138 44.04 0.3191
```

```
# Since p value is greater than 0.05, we accept null hypothesis #
Therefore, according to data collected, family history does not affect
risk  of
# heart failure
```

```
# 6. Does hours of exercise affect your BMI?
# Null hypothesis H0: Exercise does not effect BMI
# Alternate hypothesis H1: Exercise affects BMI
# Since hours of exercise and BMI are both categorical, we use chi square
tes t
```

```
chisq.test(rhd$Daily.hours.of.exercise,rhd$X.14)
```

```
## Warning in chisq.test(rhd$Daily.hours.of.exercise, rhd$X.14): Chi-
squared ## approximation may be incorrect
```

```
##
## Pearson's Chi-squared test
##
## data: rhd$Daily.hours.of.exercise and rhd$X.14
## X-squared = 4.8126, df = 9, p-value = 0.8503
```

```
# since P value is greater than 0.05, we accept null
hypothesis # Hours of exercise affects BMI
```

```
# 7. Does consumption of tobacco influence risk of heart disease? # Null
hypothesis H0: Consumption of tobacco does not influence heart disease #
Alternate hypothesis H1: Consumption of tobacco has no influence on heart
```

```
d isease
# Since Consumption of tobacco is categorical (>2 levels) and total number
is   numeric
# we use annova
anv=aov(rhd$Weekly.consumption.of.tobacco~rhd$Total>27)
summary(anv)

## Df Sum Sq Mean Sq F value Pr(>F)
## rhd$Total > 27 1 4.00 4.005 8.407 0.00435 **
## Residuals 138 65.74 0.476
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

# Since p value is lesser than 0.05, we fail to accept null
hypothesis, # therefore, consumption of tobacco influences risk of
heart disease


# 8. Does Eating outside have an influence on BMI?
# Null Hypothesis H0: Eating outside does not have any influence on BMI
# Alternate Hypothesis H1: Eating outside does have influence on BMI #
Since Eating outside and BMI are both categorical, we use chi square
test

chisq.test(rhd$How.many.times.a.week.do.you.eat.outside.,rhd$X.14)

## Warning in chisq.test(rhd$How.many.times.a.week.do.you.eat.outside.,
 rhd$X .14):
## Chi-squared approximation may be incorrect

##
## Pearson's Chi-squared test
##
## data: rhd$How.many.times.a.week.do.you.eat.outside. and
rhd$X.14 ## X-squared = 1.1129, df = 6, p-value = 0.981

# Since P Value is greater than 0.05, we accept null
hypothesis # Therefore, according to data collected,
# eating outside does not have influence on BMI
```

Effects of Job Satisfaction on Job Performance in Hospitality Industry

Submitted By-
Shelaj
Ritom
Humani
Meghana
Harmanjeet

Introduction:

One of the important industry in any economy is hospitality sector. It contributes around 7.5% GDP in Indian economy. So, for this purpose we have selected this industry for our research purpose keeping the primary objective of job satisfaction of different roles in this industry and if it effects in one's job performance and job satisfaction.

We have conducted a short study on the effects of different aspects on job satisfaction in hospitality industry. Few of the aspects that we have focused are - Social status of the job, performance appraisal, job security, manager relationship, benefits provided, work time flexibility, employee relationship, degree of freedom, etc.

Methodology:

For the purpose of this study, our method is qualitative data which we have taken through questionnaire. We have received 8 responses by this questionnaire, for which we have done hypothesis testing through R programming to find out the relation between several aspects of our study.

Hypothesis testing:

We have conducted the hypothesis testing, to find out the answers for the following questions:

1. Does work role effect job security?
2. Does work role effect higher working hours?

3. Does long working hours effect job security?

The complete hypothesis testing and its output is done as follows:

```
cat=read.csv("E:/R/R_Work/Research Data.csv")

dim(cat)

## [1]  8 24

# 1. Does Work Role effect job security ?
#Ho: There is no relation in fear of job security in people of different role
s
#Alternate hypothesis(H1):there is relation in fear of job security
chisq.test(cat$Work.Role,cat$Your.View.on.Job..Lack.of.Job.Security.is.there.
)

## Warning in chisq.test(cat$Work.Role,
## cat$Your.View.on.Job..Lack.of.Job.Security.is.there.): Chi-squared approxi
mation
## may be incorrect

##
##  Pearson's Chi-squared test
##
## data:  cat$Work.Role and cat$Your.View.on.Job..Lack.of.Job.Security.is.the
re.
## X-squared = 8.8, df = 9, p-value = 0.4559

table(cat$Work.Role,cat$Your.View.on.Job..Lack.of.Job.Security.is.there.)

##
##           1 2 3 4
##   Chef    1 0 0 0
##   CSA     0 0 0 1
##   Manager 3 1 1 0
##   Student 0 0 0 1

# Answer p>0.05,hence we accept null hypothesis.
#Hence there is no relation.

#2. Does Work Role effect Higher working hours ?
#Ho: There is no relation in Working Hour of people of different roles.
#Alternate hypothesis(H1):there is relation in Working Hour of people of diff
erent work roles
chisq.test(cat$Work.Role,cat$Your.View.on.Job..Long.Working.Hours.)

## Warning in chisq.test(cat$Work.Role, cat$Your.View.on.Job..Long.Working.Ho
urs.):
## Chi-squared approximation may be incorrect
```

```
##
##  Pearson's Chi-squared test
##
## data:  cat$Work.Role and cat$Your.View.on.Job..Long.Working.Hours.
## X-squared = 11.2, df = 9, p-value = 0.2622

# Answer p>0.05,hence we accept null hypothesis.
#Hence there is no relation.

#3. Does long working hours effect Job security
#Null hypothesis(Ho): Long working hours does is not related to Job security,
i.e. mu1= mu2
#Alternate hypothesis(H1):Long working hours is related to job security
chisq.test(cat$Your.View.on.Job..Long.Working.Hours.,cat$Your.View.on.Job..La
ck.of.Job.Security.is.there.)

## Warning in chisq.test(cat$Your.View.on.Job..Long.Working.Hours.,
## cat$Your.View.on.Job..Lack.of.Job.Security.is.there.): Chi-squared approxi
mation
## may be incorrect

##
##  Pearson's Chi-squared test
##
## data:  cat$Your.View.on.Job..Long.Working.Hours. and cat$Your.View.on.Job.
.Lack.of.Job.Security.is.there.
## X-squared = 14.667, df = 9, p-value = 0.1005

# Answer p>0.05,hence we accept null hypothesis.
#Hence there is no relation.

hist(cat$Your.View.on.Job..Repetitiveness.in.the.Job.)
```

togram of cat$Your.View.on.Job..Repetitiveness.in.t

cat$Your.View.on.Job..Repetitiveness.in.the.Job.
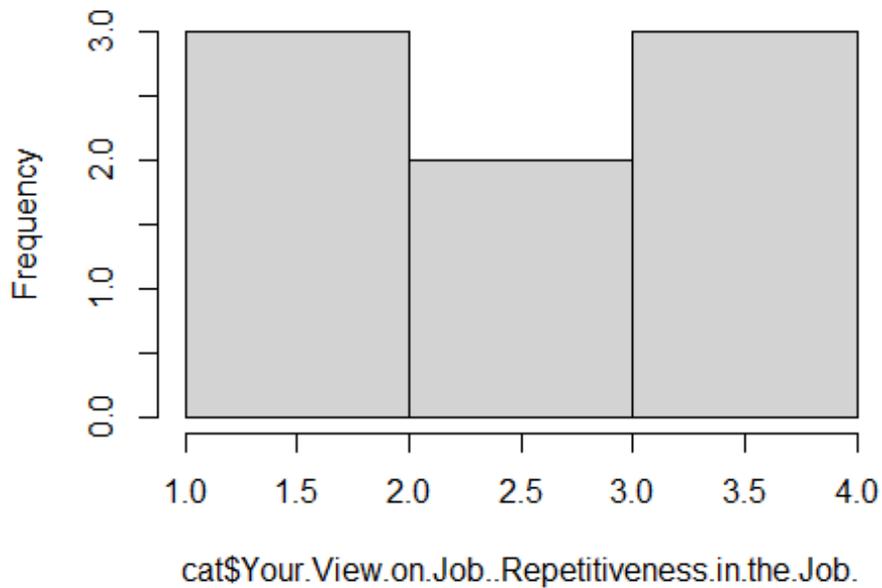
```
hist(cat$Your.View.on.Job..Long.Working.Hours.)
```

Histogram of cat$Your.View.on.Job..Long.Working.H

cat$Your.View.on.Job..Long.Working.Hours.

```
hist(cat$Your.View.on.Job..Lack.of.Job.Security.is.there.)
```

gram of cat$Your.View.on.Job..Lack.of.Job.Security

cat$Your.View.on.Job..Lack.of.Job.Security.is.there.

```
hist(cat$Your.View.on.Job..Your.performance.is.appreciated.)
```

am of cat$Your.View.on.Job..Your.performance.is.a

cat$Your.View.on.Job..Your.performance.is.appreciated.

R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
summary(cars)

##      speed            dist
##  Min.   : 4.0    Min.   :  2.00
##  1st Qu.:12.0    1st Qu.: 26.00
##  Median :15.0    Median : 36.00
##  Mean   :15.4    Mean   : 42.98
##  3rd Qu.:19.0    3rd Qu.: 56.00
##  Max.   :25.0    Max.   :120.00
```

Including Plots

You can also embed plots, for example:

Note that the echo = FALSE parameter was added to the code chunk to prevent printing of the R code that generated the plot.

Interpretation

From the above analysis, we can interpret the following:

- ➢ For our sample of population, type of work role, working hours based on their job roles all these do not really have an effect on the job security.
- ➢ Any designation in hospitality sector has similar kind of responses.

Conclusion

To conclude, there are several aspects that effects in job satisfaction and job security in hospitality sector. Though, our sample size is comparatively quite small, so we cannot give a firm conclusion, but according to our views, most people, irrespective of their gender, age, profession face these similar problems in their job.

Report On Movie/Series Viewing Analysis

Submitted By-
Siddharth
Surendra Prasath
Komathisha

```r
getwd()
```

```
## [1] "F:/ISBR/rscipt/project"
```

```r
setwd("F:/ISBR/rscipt/project")
mar<-read.csv("final dataset.csv")
```

```r
summary(mar)
```

```
##  Name.optional.        City             Gender              Age
##  Length:79          Length:79         Length:79          Length:79
##  Class :character   Class :character  Class :character   Class
:character
##  Mode  :character   Mode  :character  Mode  :character   Mode
:character
##
##
##
##   Occupation             LK         Languages.Known
##  Length:79          Min.   :1.000   Length:79
##  Class :character   1st Qu.:2.000   Class :character
##  Mode  :character   Median :3.000   Mode  :character
##                     Mean   :2.835
##                     3rd Qu.:3.000
##                     Max.   :5.000
##
Has.this.Lockdown.affected.the.amount.of.time.you.spend.in.watching.movies
.series.
```

```
##   Length:79
##   Class :character
##   Mode  :character
##
##
##
##   Favorite.Movie.Series.Genre       LW
##   Length:79                  Min.   :1.000
##   Class :character           1st Qu.:2.000
##   Mode  :character           Median :3.000
##                              Mean   :2.911
##                              3rd Qu.:4.000
##                              Max.   :9.000
##   In.which.languages.would.you.like.to.watch.movies.series.
##   Length:79
##   Class :character
##   Mode  :character
##
##
##
##
On.a.scale.of.1.5..what.is.the.influence.of.the.following.set.of.people.on
.you.in.watching.movies.series..1.very.low.influence.2.low.influence.3.neu
tral.4.high.influence.5.very.high.influence...Self.influenced.
##   Min.   :1.000
##   1st Qu.:3.000
##   Median :4.000
##   Mean   :3.595
##   3rd Qu.:4.000
##   Max.   :5.000
##
On.a.scale.of.1.5..what.is.the.influence.of.the.following.set.of.people.on
.you.in.watching.movies.series..1.very.low.influence.2.low.influence.3.neu
tral.4.high.influence.5.very.high.influence...Friends.
##   Min.   :1.000
##   1st Qu.:3.000
##   Median :4.000
##   Mean   :3.519
##   3rd Qu.:4.000
##   Max.   :5.000
##
On.a.scale.of.1.5..what.is.the.influence.of.the.following.set.of.people.on
.you.in.watching.movies.series..1.very.low.influence.2.low.influence.3.neu
tral.4.high.influence.5.very.high.influence...Family.
##   Min.   :1.000
##   1st Qu.:1.000
##   Median :2.000
##   Mean   :2.354
##   3rd Qu.:3.000
##   Max.   :5.000
##
On.a.scale.of.1.5..what.is.the.influence.of.the.following.set.of.people.on
.you.in.watching.movies.series..1.very.low.influence.2.low.influence.3.neu
tral.4.high.influence.5.very.high.influence...Mass.Media.
```

```
##   Min.   :1.000
##   1st Qu.:2.000
##   Median :3.000
##   Mean   :2.772
##   3rd Qu.:3.500
##   Max.   :5.000
##
On.a.scale.of.1.5..what.is.the.influence.of.the.following.set.of.people.on
.you.in.watching.movies.series..1.very.low.influence.2.low.influence.3.neu
tral.4.high.influence.5.very.high.influence...Social.Media.
##   Min.   :1.000
##   1st Qu.:2.000
##   Median :3.000
##   Mean   :3.241
##   3rd Qu.:4.000
##   Max.   :5.000
##
On.a.scale.of.1.5.How.interested.are.you.to.watch.movies.series.with.the.f
ollowing.people...1.no.interest.2.least.interested.3.neutral.4.interested.
5.very.interested...Alone.
##   Min.   :1.000
##   1st Qu.:4.000
##   Median :5.000
##   Mean   :4.228
##   3rd Qu.:5.000
##   Max.   :5.000
##
On.a.scale.of.1.5.How.interested.are.you.to.watch.movies.series.with.the.f
ollowing.people...1.no.interest.2.least.interested.3.neutral.4.interested.
5.very.interested...With.Family.
##   Min.   :1.000
##   1st Qu.:2.000
##   Median :3.000
##   Mean   :2.911
##   3rd Qu.:4.000
##   Max.   :5.000
##
On.a.scale.of.1.5.How.interested.are.you.to.watch.movies.series.with.the.f
ollowing.people...1.no.interest.2.least.interested.3.neutral.4.interested.
5.very.interested...With.Friends.
##   Min.   :1.000
##   1st Qu.:3.000
##   Median :4.000
##   Mean   :3.519
##   3rd Qu.:4.000
##   Max.   :5.000
##   How.much.time.do.you.spend.in.watching.movies.series.
##   Length:79
##   Class :character
##   Mode  :character
##
##
##
##
```

```
On.a.scale.of.1.5..what.is.your.preference.in.watching.movies.series...1.l
east.preferred.2.slightly.preferred.3.neutral.4.highly.preferred.5.very.hi
ghly.preferred...Theatres.
##   Min.   :1.000
##   1st Qu.:3.000
##   Median :4.000
##   Mean   :3.456
##   3rd Qu.:5.000
##   Max.   :5.000
##
On.a.scale.of.1.5..what.is.your.preference.in.watching.movies.series...1.l
east.preferred.2.slightly.preferred.3.neutral.4.highly.preferred.5.very.hi
ghly.preferred...TV.
##   Min.   :1.000
##   1st Qu.:2.000
##   Median :3.000
##   Mean   :2.873
##   3rd Qu.:4.000
##   Max.   :5.000
##
On.a.scale.of.1.5..what.is.your.preference.in.watching.movies.series...1.l
east.preferred.2.slightly.preferred.3.neutral.4.highly.preferred.5.very.hi
ghly.preferred...Online.Streaming.OTT.
##   Min.   :1.000
##   1st Qu.:3.000
##   Median :4.000
##   Mean   :3.823
##   3rd Qu.:5.000
##   Max.   :5.000
##
On.a.scale.of.1.5..what.are.the.platforms.you.prefer.in.watching.movies.se
ries.in.online.streaming.OTT...1.least.preferred.2.slightly.preferred.3.ne
utral.4.highly.preferred.5.very.highly.preferred...Netflix.
##   Min.   :1.000
##   1st Qu.:3.000
##   Median :4.000
##   Mean   :3.671
##   3rd Qu.:5.000
##   Max.   :5.000
##
On.a.scale.of.1.5..what.are.the.platforms.you.prefer.in.watching.movies.se
ries.in.online.streaming.OTT...1.least.preferred.2.slightly.preferred.3.ne
utral.4.highly.preferred.5.very.highly.preferred...Amazon.Prime.
##   Min.   :1
##   1st Qu.:4
##   Median :4
##   Mean   :4
##   3rd Qu.:5
##   Max.   :5
##
On.a.scale.of.1.5..what.are.the.platforms.you.prefer.in.watching.movies.se
ries.in.online.streaming.OTT...1.least.preferred.2.slightly.preferred.3.ne
utral.4.highly.preferred.5.very.highly.preferred...Hotstar.
##   Min.   :1.00
```

```
##   1st Qu.:3.00
##   Median :4.00
##   Mean   :3.38
##   3rd Qu.:4.50
##   Max.   :5.00
##
On.a.scale.of.1.5..what.are.the.platforms.you.prefer.in.watching.movies.se
ries.in.online.streaming.OTT...1.least.preferred.2.slightly.preferred.3.ne
utral.4.highly.preferred.5.very.highly.preferred...MX.Player.
##   Min.   :1.00
##   1st Qu.:1.00
##   Median :2.00
##   Mean   :2.38
##   3rd Qu.:3.00
##   Max.   :5.00
##
On.a.scale.of.1.5..what.are.the.platforms.you.prefer.in.watching.movies.se
ries.in.online.streaming.OTT...1.least.preferred.2.slightly.preferred.3.ne
utral.4.highly.preferred.5.very.highly.preferred...SUN.NXT.
##   Min.   :1.000
##   1st Qu.:1.000
##   Median :1.000
##   Mean   :1.886
##   3rd Qu.:3.000
##   Max.   :5.000
##   Do.you.prefer.movies.being.released.directly.on.online.streaming.OTT.
##   Length:79
##   Class :character
##   Mode  :character
##
##
##
##
Post.Lockdown..Will.you.continue.watching.movies.series.the.same.amount.of
.time.like.you.watch.during.lockdown
##   Length:79
##   Class :character
##   Mode  :character
##
##
##
```

```
table(mar$Age)
```

```
##
## 16-25 years 26-35 years 46-55 years
##          61          17           1
```

```
table(mar$Gender)
```

```
##
##  Alien Female   Male
##      1     42     36
```

```
table(mar$Occupation)
```

```
##
##        Employee    Home Maker      Housewife    Housewife  Self Employed
##             39             1              1             1              4
##         Student
##             33
```

```r
table(mar$Age,mar$Gender,mar$Occupation)
```

```
## , ,  = Employee
##
##
##             Alien Female Male
##   16-25 years     1     17   10
##   26-35 years     0      3    7
##   46-55 years     0      1    0
##
## , ,  = Home Maker
##
##
##             Alien Female Male
##   16-25 years     0      0    0
##   26-35 years     0      1    0
##   46-55 years     0      0    0
##
## , ,  = Housewife
##
##
##             Alien Female Male
##   16-25 years     0      0    0
##   26-35 years     0      1    0
##   46-55 years     0      0    0
##
## , ,  = Housewife
##
##
##             Alien Female Male
##   16-25 years     0      0    0
##   26-35 years     0      0    1
##   46-55 years     0      0    0
##
## , ,  = Self Employed
##
##
##             Alien Female Male
##   16-25 years     0      0    1
##   26-35 years     0      0    3
##   46-55 years     0      0    0
##
## , ,  = Student
##
##
##             Alien Female Male
##   16-25 years     0     18   14
```

```
##   26-35 years      0      1     0
##   46-55 years      0      0     0
```

#COMPARISON ON LANGUAGES KNOWN AND PREFERED BY THE USERS

```
par(mfrow=c(1:2))
barplot(mar$LK, col = "red",main = "Languages known")
barplot(mar$LW, col = "green",main = "Languages wish to watch")
```
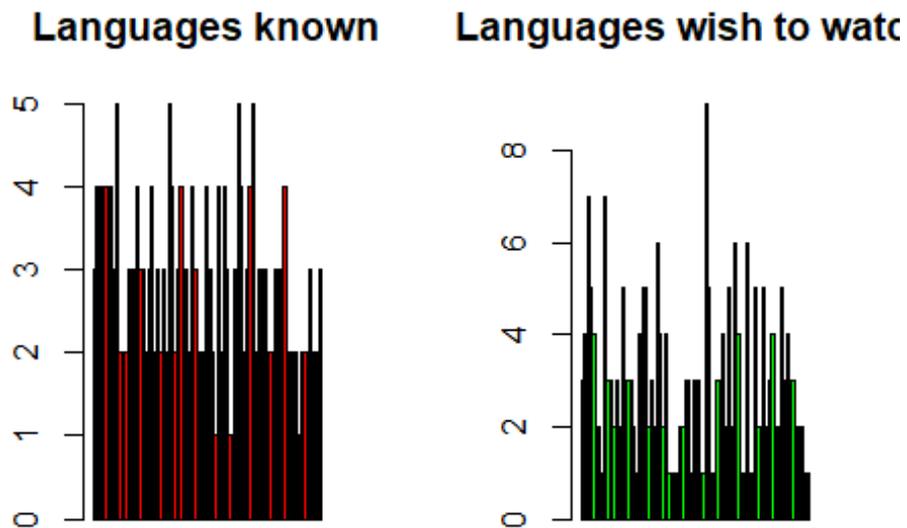

#FREQUENCY OF INFLUENCE FROM PEOPLE ON WATCHING MOVIE/SERIES
#SELF INFLUENCED

```
hist(mar$On.a.scale.of.1.5..what.is.the.influence.of.the.following.set.of.
people.on.you.in.watching.movies.series..1.very.low.influence.2.low.influe
nce.3.neutral.4.high.influence.5.very.high.influence...Self.influenced.)
```

ple.on.you.in.watching.movies.series..1.very.low.infl
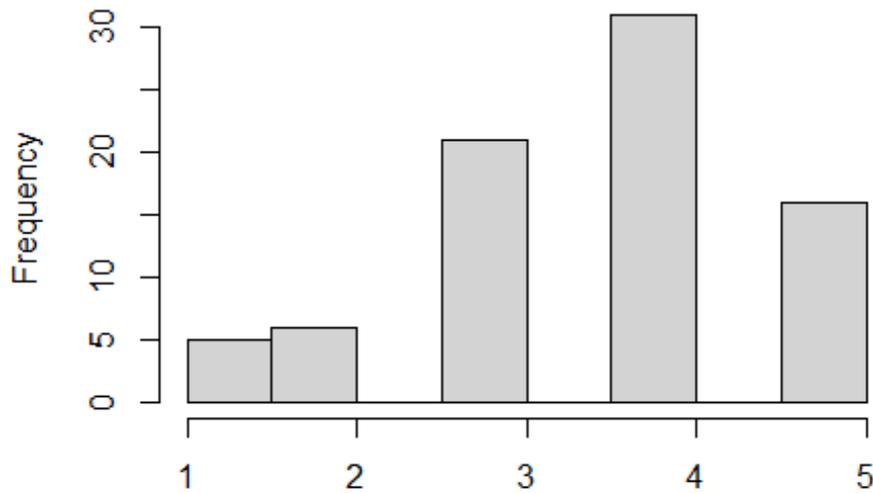
:people.on.you.in.watching.movies.series..1.very.low.influence.2.low.in

```
#FREQUENCY OF INFLUENCE FROM PEOPLE ON WATCHING MOVIE/SERIES
#FRIENDS

hist(mar$On.a.scale.of.1.5..what.is.the.influence.of.the.following.set.of.
people.on.you.in.watching.movies.series..1.very.low.influence.2.low.influe
nce.3.neutral.4.high.influence.5.very.high.influence...Friends.)
```

people.on.you.in.watching.movies.series..1.very.low
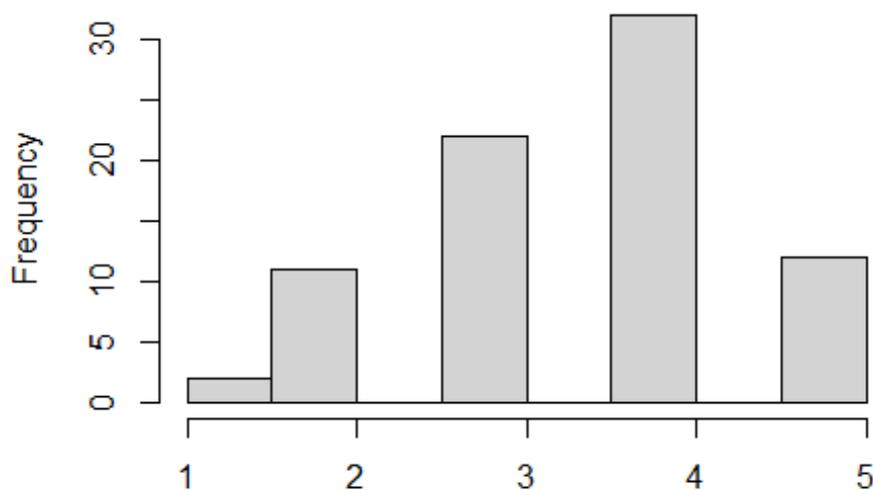
et.of.people.on.you.in.watching.movies.series..1.very.low.influence.2.lo

```
#FREQUENCY OF INFLUENCE FROM PEOPLE ON WATCHING MOVIE/SERIES
#FAMILY

hist(mar$On.a.scale.of.1.5..what.is.the.influence.of.the.following.set.of.
people.on.you.in.watching.movies.series..1.very.low.influence.2.low.influe
nce.3.neutral.4.high.influence.5.very.high.influence...Family.)
```

î.people.on.you.in.watching.movies.series..1.very.low
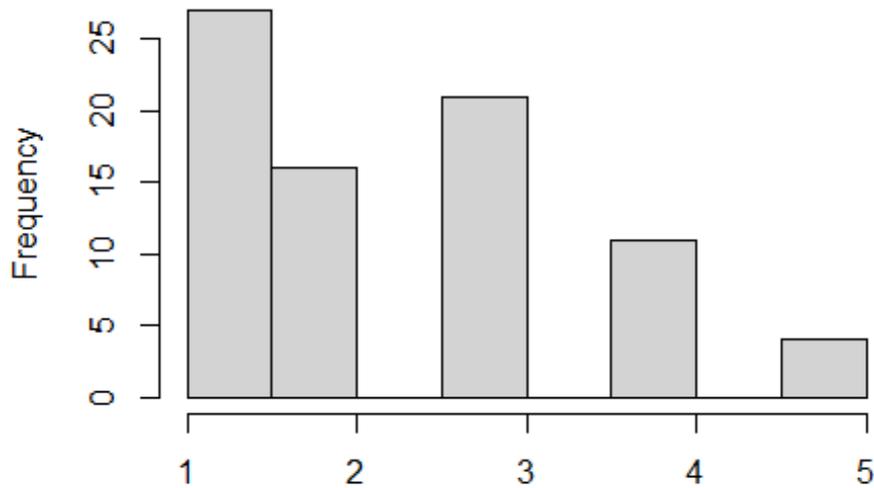
et.of.people.on.you.in.watching.movies.series..1.very.low.influence.2.lo

```
#FREQUENCY OF INFLUENCE FROM PEOPLE ON WATCHING MOVIE/SERIES
#SOCIAL MEDIA

hist(mar$On.a.scale.of.1.5..what.is.the.influence.of.the.following.set.of.
people.on.you.in.watching.movies.series..1.very.low.influence.2.low.influe
nce.3.neutral.4.high.influence.5.very.high.influence...Social.Media.)
```

ople.on.you.in.watching.movies.series..1.very.low.in

f.people.on.you.in.watching.movies.series..1.very.low.influence.2.low.ir

```
#FREQUENCY USAGE OF ONLINE PLATFORMS
#NETFLIX

t.test(mar$On.a.scale.of.1.5..what.are.the.platforms.you.prefer.in.watchin
g.movies.series.in.online.streaming.OTT...1.least.preferred.2.slightly.pre
ferred.3.neutral.4.highly.preferred.5.very.highly.preferred...Netflix.,mu=
2)

##
##  One Sample t-test
##
## data:
mar$On.a.scale.of.1.5..what.are.the.platforms.you.prefer.in.watching.movie
s.series.in.online.streaming.OTT...1.least.preferred.2.slightly.preferred.
3.neutral.4.highly.preferred.5.very.highly.preferred...Netflix.
## t = 10.136, df = 78, p-value = 6.91e-16
## alternative hypothesis: true mean is not equal to 2
## 95 percent confidence interval:
##  3.342707 3.999065
## sample estimates:
## mean of x
##  3.670886

hist(mar$On.a.scale.of.1.5..what.are.the.platforms.you.prefer.in.watching.
movies.series.in.online.streaming.OTT...1.least.preferred.2.slightly.prefe
rred.3.neutral.4.highly.preferred.5.very.highly.preferred...Netflix.)
```

ɔ.movies.series.in.online.streaming.OTT...1.least.pret
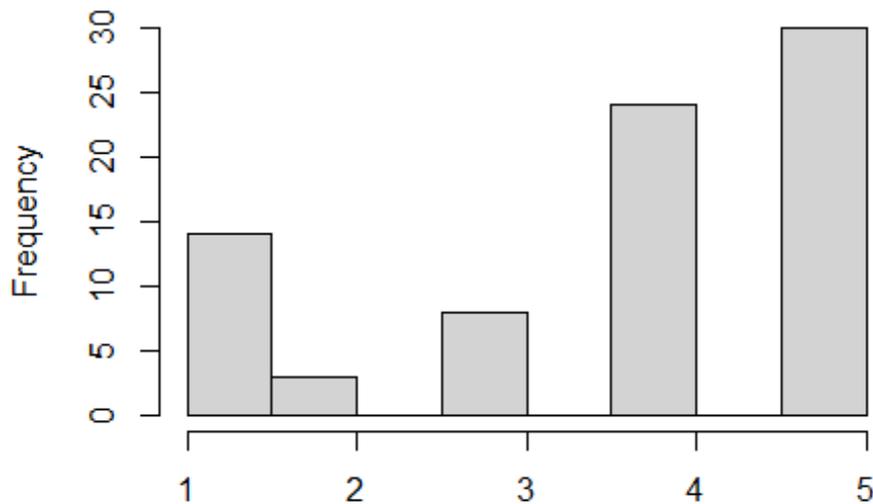
hing.movies.series.in.online.streaming.OTT...1.least.preferred.2.slightl

```
#FREQUENCY USAGE OF ONLINE PLATFORMS
#AMAZON PRIME

t.test(mar$On.a.scale.of.1.5..what.are.the.platforms.you.prefer.in.watchin
g.movies.series.in.online.streaming.OTT...1.least.preferred.2.slightly.pre
ferred.3.neutral.4.highly.preferred.5.very.highly.preferred...Amazon.Prime
.,mu=2)

##
##   One Sample t-test
##
## data:
mar$On.a.scale.of.1.5..what.are.the.platforms.you.prefer.in.watching.movie
s.series.in.online.streaming.OTT...1.least.preferred.2.slightly.preferred.
3.neutral.4.highly.preferred.5.very.highly.preferred...Amazon.Prime.
## t = 14.099, df = 78, p-value < 2.2e-16
## alternative hypothesis: true mean is not equal to 2
## 95 percent confidence interval:
##  3.717585 4.282415
## sample estimates:
## mean of x
##          4

hist(mar$On.a.scale.of.1.5..what.are.the.platforms.you.prefer.in.watching.
movies.series.in.online.streaming.OTT...1.least.preferred.2.slightly.prefe
rred.3.neutral.4.highly.preferred.5.very.highly.preferred...Amazon.Prime.)
```

vies.series.in.online.streaming.OTT...1.least.preferre
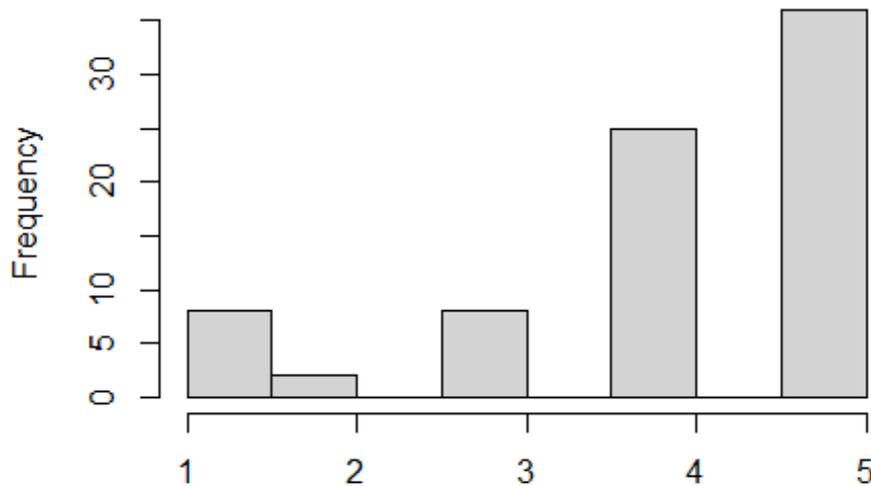
.movies.series.in.online.streaming.OTT...1.least.preferred.2.slightly.pre

```
#FREQUENCY USAGE OF ONLINE PLATFORMS
#HOTSTAR

t.test(mar$On.a.scale.of.1.5..what.are.the.platforms.you.prefer.in.watchin
g.movies.series.in.online.streaming.OTT...1.least.preferred.2.slightly.pre
ferred.3.neutral.4.highly.preferred.5.very.highly.preferred...Hotstar.,mu=
2)

##
##  One Sample t-test
##
## data:
mar$On.a.scale.of.1.5..what.are.the.platforms.you.prefer.in.watching.movie
s.series.in.online.streaming.OTT...1.least.preferred.2.slightly.preferred.
3.neutral.4.highly.preferred.5.very.highly.preferred...Hotstar.
## t = 8.8846, df = 78, p-value = 1.807e-13
## alternative hypothesis: true mean is not equal to 2
## 95 percent confidence interval:
##  3.070577 3.688917
## sample estimates:
## mean of x
##  3.379747

hist(mar$On.a.scale.of.1.5..what.are.the.platforms.you.prefer.in.watching.
movies.series.in.online.streaming.OTT...1.least.preferred.2.slightly.prefe
rred.3.neutral.4.highly.preferred.5.very.highly.preferred...Hotstar.)
```

.movies.series.in.online.streaming.OTT...1.least.pref
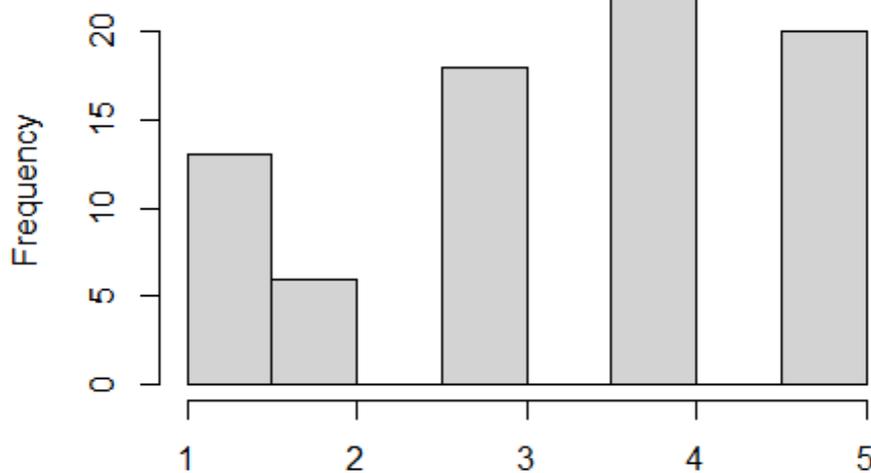
ning.movies.series.in.online.streaming.OTT...1.least.preferred.2.slightly

```
#FREQUENCY USAGE OF ONLINE PLATFORMS
#MX PLAYER

t.test(mar$On.a.scale.of.1.5..what.are.the.platforms.you.prefer.in.watchin
g.movies.series.in.online.streaming.OTT...1.least.preferred.2.slightly.pre
ferred.3.neutral.4.highly.preferred.5.very.highly.preferred...MX.Player.,m
u=2)

##
##  One Sample t-test
##
## data:
mar$On.a.scale.of.1.5..what.are.the.platforms.you.prefer.in.watching.movie
s.series.in.online.streaming.OTT...1.least.preferred.2.slightly.preferred.
3.neutral.4.highly.preferred.5.very.highly.preferred...MX.Player.
## t = 2.532, df = 78, p-value = 0.01335
## alternative hypothesis: true mean is not equal to 2
## 95 percent confidence interval:
##  2.081160 2.678334
## sample estimates:
## mean of x
##  2.379747

hist(mar$On.a.scale.of.1.5..what.are.the.platforms.you.prefer.in.watching.
movies.series.in.online.streaming.OTT...1.least.preferred.2.slightly.prefe
rred.3.neutral.4.highly.preferred.5.very.highly.preferred...MX.Player.)
```

movies.series.in.online.streaming.OTT...1.least.prefei
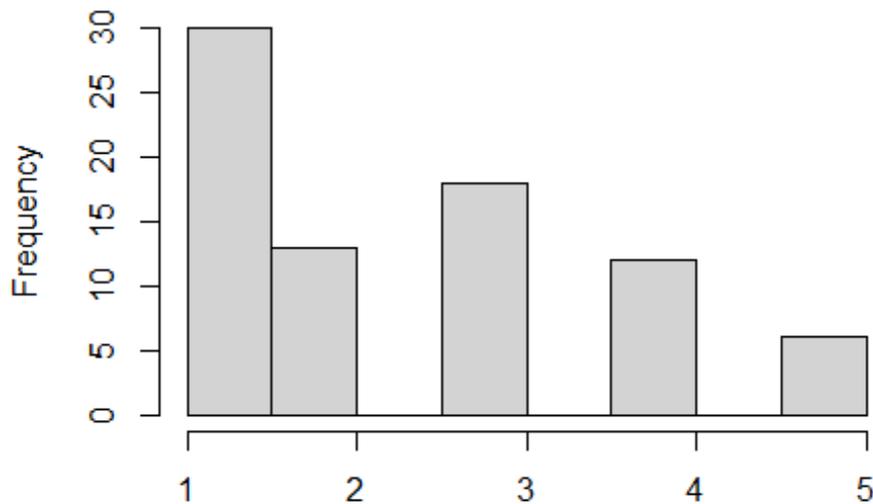
ng.movies.series.in.online.streaming.OTT...1.least.preferred.2.slightly.p

```
#FREQUENCY USAGE OF ONLINE PLATFORMS
#SUN NXT

t.test(mar$On.a.scale.of.1.5..what.are.the.platforms.you.prefer.in.watchin
g.movies.series.in.online.streaming.OTT...1.least.preferred.2.slightly.pre
ferred.3.neutral.4.highly.preferred.5.very.highly.preferred...SUN.NXT.,mu=
2)

##
##   One Sample t-test
##
## data:
mar$On.a.scale.of.1.5..what.are.the.platforms.you.prefer.in.watching.movie
s.series.in.online.streaming.OTT...1.least.preferred.2.slightly.preferred.
3.neutral.4.highly.preferred.5.very.highly.preferred...SUN.NXT.
## t = -0.90348, df = 78, p-value = 0.3691
## alternative hypothesis: true mean is not equal to 2
## 95 percent confidence interval:
##  1.635041 2.137111
## sample estimates:
## mean of x
##  1.886076

hist(mar$On.a.scale.of.1.5..what.are.the.platforms.you.prefer.in.watching.
movies.series.in.online.streaming.OTT...1.least.preferred.2.slightly.prefe
rred.3.neutral.4.highly.preferred.5.very.highly.preferred...SUN.NXT.)
```

movies.series.in.online.streaming.OTT...1.least.prefe
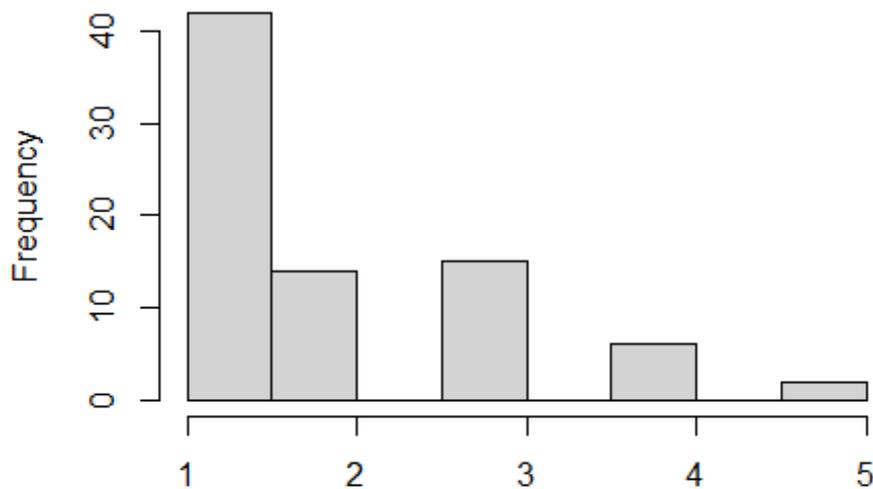
ng.movies.series.in.online.streaming.OTT...1.least.preferred.2.slightly.

#INFLUENCE OF AGE IN WATCHING PATTERN

```
chisq.test(mar$Age,mar$How.much.time.do.you.spend.in.watching.movies.serie
s.)
```

```
## Warning in chisq.test(mar$Age,
## mar$How.much.time.do.you.spend.in.watching.movies.series.): Chi-squared
## approximation may be incorrect
```

```
##
##   Pearson's Chi-squared test
##
## data:  mar$Age and
mar$How.much.time.do.you.spend.in.watching.movies.series.
## X-squared = 5.6253, df = 10, p-value = 0.8457
```

#THE RESULT TELLS US THAT AGE HAVE AN EFFECT ON WATCHING PATTERN

#INFLUENCE OF GENDER IN WATCHING PATTERN

```
chisq.test(mar$Gender,mar$How.much.time.do.you.spend.in.watching.movies.se
ries.)
```

```
## Warning in chisq.test(mar$Gender,
## mar$How.much.time.do.you.spend.in.watching.movies.series.): Chi-squared
## approximation may be incorrect
```

```
##
##   Pearson's Chi-squared test
##
## data:  mar$Gender and
```

```
mar$How.much.time.do.you.spend.in.watching.movies.series.
## X-squared = 8.1814, df = 10, p-value = 0.6111
```

#THE RESULT TELLS US THAT GENDER HAVE AN EFFECT ON WATCHING PATTERN

#INFLUENCE OF OCCUPATION IN WATCHING PATTERN

```
chisq.test(mar$Occupation,mar$How.much.time.do.you.spend.in.watching.movie
s.series.)

## Warning in chisq.test(mar$Occupation,
## mar$How.much.time.do.you.spend.in.watching.movies.series.): Chi-squared
## approximation may be incorrect

##
##   Pearson's Chi-squared test
##
## data:  mar$Occupation and
mar$How.much.time.do.you.spend.in.watching.movies.series.
## X-squared = 25.238, df = 25, p-value = 0.4491
```

#THE RESULT TELLS US THAT OCCUPATION HAVE A SIGNIFICANT EFFECT ON WATCHING PATTERN

#USER PREFERENCE IN WATCHING MOVIES (THEATRES)

```
boxplot(mar$On.a.scale.of.1.5..what.is.your.preference.in.watching.movies.
series...1.least.preferred.2.slightly.preferred.3.neutral.4.highly.preferr
ed.5.very.highly.preferred...Theatres.)
```
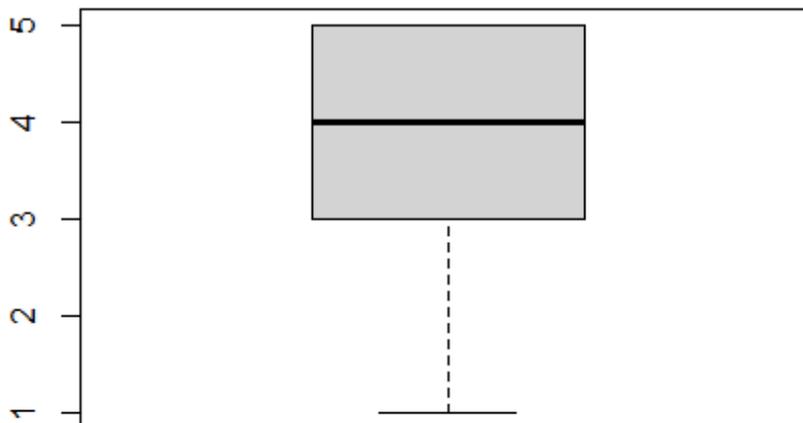

#USER PREFERENCE IN WATCHING MOVIES (TELEVISION)

```
boxplot(mar$On.a.scale.of.1.5..what.is.your.preference.in.watching.movies.
series...1.least.preferred.2.slightly.preferred.3.neutral.4.highly.preferr
ed.5.very.highly.preferred...TV.)
```
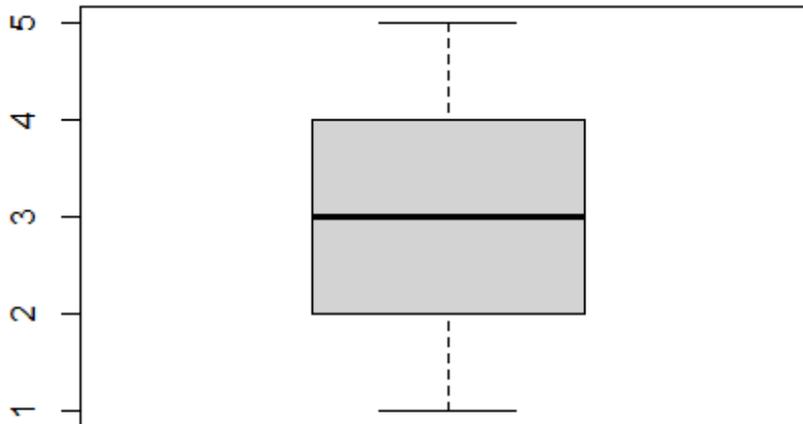


```
#USER PREFERENCE IN WATCHING MOVIES (OTT)
```

```
boxplot(mar$On.a.scale.of.1.5..what.is.your.preference.in.watching.movies.
series...1.least.preferred.2.slightly.preferred.3.neutral.4.highly.preferr
ed.5.very.highly.preferred...Online.Streaming.OTT.)
```
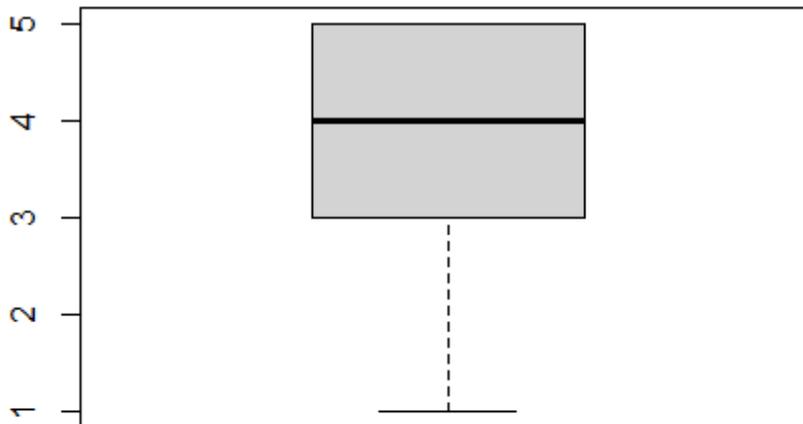
```
#WE CONCLUDE THAT,
#THE USERS ARE MOSTLY INFLUENCED BY FRIENDS AND THROUGH SOCIAL MEDIA TO
USE ONLINE PLATFORMS FOR MOVIES/SERIES
#IN THE CASE OF USAGE NETFLIX AND AMAZON PRIME HAS MORE USAGE THAN OTHERS
#FORM THE SERIES OF T-TEST ON ALL OTT PLATFORMS, WE CAN CONCLUDE THAT
NETFLIX IS MOST PREFERED TO WATCH MOVIES/SERIES
#ACCORDING TO OUR DATA USERS DO NOT CONSTRAIN THEMSELVES TO THE LANGUAGES
THEY KNOW. THEY PREFER WATCHING IN ANY LANGUAGE
```

R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
summary(cars)

##      speed           dist
##  Min.   : 4.0   Min.   :  2.00
##  1st Qu.:12.0   1st Qu.: 26.00
##  Median :15.0   Median : 36.00
##  Mean   :15.4   Mean   : 42.98
##  3rd Qu.:19.0   3rd Qu.: 56.00
##  Max.   :25.0   Max.   :120.00
```

Including Plots

You can also embed plots, for example:

Note that the echo = FALSE parameter was added to the code chunk to prevent printing of the R code that generated the plot.

The Impact of Employee Engagement on Organization

Submitted By-
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Taha Aktar
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Shashi Singh

Introduction

An Employee Engagement Survey measures the degree to which employees feel valued at your company. The purpose of this research is to identify the *"The impact of Employee Engagement on organization"*. We have focused on the qualitative analysis method for collecting data in form of responses through online survey form. This questionnaire design for study the factors of employee engagement and performance. Tracking employee engagement is important in determining whether or not your employees are happy and how long they'll stay with your company.

Objective

- To study the impact of Employee Engagement on organization
- To Synthesize the outcomes associated with employee engagement

Importance

The core idea of employee engagement analysis is to keep employees invested in the business both implicitly and explicitly. also below points :

- Engaged employees boost productivity
- Employee engagement increases customer satisfaction
- Employee engagement enhances company culture

- Engagement is a symptom of success

Methodology:

Quantitative analysis has been done by conducting various hypothesis testing. Data collection has been done by making use of questionnaire survey from 106 employees with the help of google form survey.

Hypothesis Testing:

- Annova Test (One numeric, one categorical for more than two levels)

- t – test

- Chi Square Test: Test of independence (Two Categorical variables)

Interpretation and Output(Coading):

```
getwd()

setwd("C:/Users/Dell/Documents/SAGAR/ISBR22")

ee<-read.csv("Employee_data.csv")

str(ee)

## 'data.frame':    105 obs. of  18 variables:
##  $ Age                  : int  21-25 21-25 21-25 26-30 21-25 21-25 ..
.
##  $ Gender               : chr  "Male" "Male" "Female" "Male" ...
##  $ Kmdep                : chr  "Yes" "Yes" "Yes" "Yes" ...
##  $ Decisionmaking       : chr  "Agree" "Strongly Agree" "Agree" "Agre
e" ...
##  $ libertytoaccess      : chr  "Agree" "Agree" "Disagree" "Strongly A
gree" ...
##  $ Virtualplatformexp   : chr  "Satisfied" "Satisfied" "Satisfied" "D
issatisfied" ...
##  $ Seniorleadershipsupport: chr  "Agree" "Strongly Agree" "Agree" "Stro
ngly Agree" ...
##  $ Constructivefeedback : chr  "Neutral" "Strongly Agree" "Neutral" "
Agree" ...
##  $ Customerservice      : chr  "Neutral" "Strongly Agree" "Disagree"
"Strongly Agree" ...
##  $ Newlearning          : chr  "Agree" "Agree" "Agree" "Strongly Agre
e" ...
##  $ budgetallocation     : int  30 50 30 15 30 15 50 30 30 70 ...
##  $ Businessstrategy     : chr  "Agree" "Agree" "Agree" "Strongly Agre
e" ...
##  $ Knowledgetransfer    : chr  "Agree" "Agree" "Agree" "Agree" ...
##  $ Customerfocus        : chr  "Agree" "Agree" "Agree" "Strongly Agre
e" ...
##  $ Selfupskilling       : chr  "Disagree" "Agree" "Neutral" "Strongly
Agree" ...
```

```
##  $ Improperselection      : chr  "Agree" "Agree" "Agree" "Disagree" ...
##  $ Technicalproblem       : chr  "Strongly Agree" "Strongly Agree" "Agr
ee" "Agree" ...
##  $ productivity           : chr  "Strongly Agree" "Strongly Agree" "Str
ongly Agree" "Strongly Agree" ...
##  $ KMservice              : chr  "Strongly Agree" "Strongly Agree" "Str
ongly Agree" "Strongly Agree" ...
##  $ overallproductivity    : chr  "Strongly Agree" "Agree" "Strongly Agr
ee" "Strongly Agree" ...
```

summary(ee)

```
##       Age              Exp            Gender             Kmdep
##  Min.   :21.00   Min.   :1.000   Length:105        Length:105
##  1st Qu.:22.25   1st Qu.:2.000   Class :character   Class :character
Timestamp            Age                 Gender
```

 Length:105   Length:105   Length:105

 Class :character   Class :character   Class :character

 Mode :character   Mode :character   Mode :character

 Does.your.supervisor.recognize.your.efforts.when.you.perform.well.

 Length:105

 Class :character

 Mode :character

 Do.you.receive.timely.feedback.from.your.peers.

 Length:105

 Class :character

 Mode :character

 Do.your.team.members.contribute.to.your.success.

 Length:105

 Class :character

 Mode :character

 Are.you.able.to.give.a.fair.amount.of.time.to.your.family.

 Length:105

 Class :character

 Mode :character

 Do.you.feel.the.employee.evaluation.process.is.fair.

 Length:105

```
Class :character

Mode  :character

Does.your.team.participate.and.encourage.you.to.complete.your.tasks.

Length:105

Class :character

Mode  :character

Do.you.think.employee.engagement.is.important.

Length:105

Class :character

Mode  :character

Is.your.manager.professional.and.cordial.while.communicating.with.you.

Length:105

Class :character

Mode  :character

Do.you.feel.leadership.in.the.organisation.treats.all.employees.equally.

Length:105

Class :character

Mode  :character

Do.you.feel.employee.receive.effective.communication.about.the.changes.in
.policies.and.procedures.

Length:105

Class :character

Mode  :character

Do.you.think.work.causes.unwanted.tensions.in.your.personal.life.

Length:105

Class :character

Mode  :character

Do.you.feel.the.amount.of.work.allotted.to.you.is.reasonable.

Length:105

Class :character

Mode  :character
```

```
 What.truly.drives.engagement.in.an.organisation.

 Length:105

 Class :character

 Mode  :character

 Is.there.a.strong.feeling.of.teamwork.and.participation.in.the.organisati
on.

 Length:105

 Class :character

 Mode  :character

 Do.you.feel.your.organisation.is.supportive.of.a.healthy.work.life.balanc
e.

 Length:105

 Class :character

 Mode  :character
```

```r
Gender = as.factor(c("Male","Female"))
Gender
```

```
## [1] Male    Female
## Levels: Female Male
```

```r
x=factor(Gender,order=TRUE,levels = c("Male","Female") )
x
```

```
## [1] Male    Female
## Levels: Male < Female
```

```r
Virtualplatformexp = as.factor(c("Extremely dissatisfied","Dissatisfied","
Neutral","Satisfied","Very Satisfied"))
Virtualplatformexp
```

```
## [1] Extremely dissatisfied Dissatisfied           Neutral
## [4] Satisfied              Very Satisfied
## 5 Levels: Dissatisfied Extremely dissatisfied Neutral ... Very Satisfie
d
```

```r
y=factor(Virtualplatformexp,order=TRUE,levels = c("Extremely dissatisfied"
,"Dissatisfied","Neutral","Satisfied","Very Satisfied"))
y
```

```
## [1] Extremely dissatisfied Dissatisfied           Neutral
## [4] Satisfied              Very Satisfied
## 5 Levels: Extremely dissatisfied < Dissatisfied < Neutral < ... < Very
Satisfied

Knowledgetransfer = as.factor(c("Strongly Disagree","Disagree","Neutral","
Agree","Strongly Agree"))
Knowledgetransfer

## [1] Strongly Disagree Disagree          Neutral           Agree
## [5] Strongly Agree
## Levels: Agree Disagree Neutral Strongly Agree Strongly Disagree

z=factor(Employeeperformance,order=TRUE,levels = c("Strongly Disagree","Di
sagree","Neutral","Agree","Strongly Agree"))
z

## [1] Strongly Disagree Disagree          Neutral           Agree
## [5] Strongly Agree
## 5 Levels: Strongly Disagree < Disagree < Neutral < ... < Strongly Agree

overallproductivity = as.factor(c("Strongly Disagree","Disagree","Neutral"
,"Agree","Strongly Agree"))
overallproductivity

## [1] Strongly Disagree Disagree          Neutral           Agree
## [5] Strongly Agree
## Levels: Agree Disagree Neutral Strongly Agree Strongly Disagree

a=factor(overallproductivity,order=TRUE,levels = c("Strongly Disagree","Di
sagree","Neutral","Agree","Strongly Agree"))
a

## [1] Strongly Disagree Disagree          Neutral           Agree
## [5] Strongly Agree
## 5 Levels: Strongly Disagree < Disagree < Neutral < ... < Strongly Agree

Customerfocus = as.factor(c("Strongly Disagree","Disagree","Neutral","Agre
e","Strongly Agree"))
Customerfocus

## [1] Strongly Disagree Disagree          Neutral           Agree
## [5] Strongly Agree
## Levels: Agree Disagree Neutral Strongly Agree Strongly Disagree

b=factor(Customerfocus,order=TRUE,levels = c("Strongly Disagree","Disagree
","Neutral","Agree","Strongly Agree"))
b

## [1] Strongly Disagree Disagree          Neutral           Agree
## [5] Strongly Agree
## 5 Levels: Strongly Disagree < Disagree < Neutral < ... < Strongly Agree

Businessstrategy = as.factor(c("Strongly Disagree","Disagree","Neutral","A
gree","Strongly Agree"))
Businessstrategy
```

```
## [1] Strongly Disagree Disagree           Neutral          Agree
## [5] Strongly Agree
## Levels: Agree Disagree Neutral Strongly Agree Strongly Disagree

c=factor(Businessstrategy,order=TRUE,levels = c("Strongly Disagree","Disag
ree","Neutral","Agree","Strongly Agree"))
c

## [1] Strongly Disagree Disagree           Neutral          Agree
## [5] Strongly Agree
## 5 Levels: Strongly Disagree < Disagree < Neutral < ... < Strongly Agree

Seniorleadershipmanagement = as.factor(c("Strongly Disagree","Disagree","N
eutral","Agree","Strongly Agree"))
Seniorleadershipmanagement

## [1] Strongly Disagree Disagree           Neutral          Agree
## [5] Strongly Agree
## Levels: Agree Disagree Neutral Strongly Agree Strongly Disagree

d=factor(Seniorleadershipsupport,order=TRUE,levels = c("Strongly Disagree"
,"Disagree","Neutral","Agree","Strongly Agree"))
d

## [1] Strongly Disagree Disagree           Neutral          Agree
## [5] Strongly Agree
## 5 Levels: Strongly Disagree < Disagree < Neutral < ... < Strongly Agree

Selfupskilling = as.factor(c("Strongly Disagree","Disagree","Neutral","Agr
ee","Strongly Agree"))
Selfupskilling

## [1] Strongly Disagree Disagree           Neutral          Agree
## [5] Strongly Agree
## Levels: Agree Disagree Neutral Strongly Agree Strongly Disagree

e=factor(Selfupskilling,order=TRUE,levels = c("Strongly Disagree","Disagre
e","Neutral","Agree","Strongly Agree"))
e

## [1] Strongly Disagree Disagree           Neutral          Agree
## [5] Strongly Agree
## 5 Levels: Strongly Disagree < Disagree < Neutral < ... < Strongly Agree

Constructivefeedback = as.factor(c("Strongly Disagree","Disagree","Neutral
","Agree","Strongly Agree"))
Constructivefeedback

## [1] Strongly Disagree Disagree           Neutral          Agree
## [5] Strongly Agree
## Levels: Agree Disagree Neutral Strongly Agree Strongly Disagree

f=factor(Constructivefeedback,order=TRUE,levels = c("Strongly Disagree","D
isagree","Neutral","Agree","Strongly Agree"))
f
```

```
## [1] Strongly Disagree Disagree           Neutral            Agree
## [5] Strongly Agree
## 5 Levels: Strongly Disagree < Disagree < Neutral < ... < Strongly Agree

#1.
#Does age of employee in present organization influences Employee Engageme
nt.
#Null hypothesis: age of employeein present organization not influences Em
ployee Engagement
#Alternate hypothesis: age of employee in present organization influences
Employee Engagement
#As in this case we have more than two levels in categorical variable
#Anova test(One numerical, one categorical for more than two levels)
anv<- aov(ee$age~ee$Employeeperformance)
summary(anv)

##                    Df Sum Sq Mean Sq F value Pr(>F)
## ee$Knowledgetransfer  3   0.82  0.2024   0.202   0.66
## Residuals            53  79.00  1.3383

#p>0.05 so we accept null hypothesis which explains age of employee in pre
sent organization not influences Employee Engagement

#2.
#Does employee age affected Decision making.

#Null hypothesis:  employee age does not affected Decision making

#Alternate hypothesis: Does employee age affected Decision making


#Anova test(One numerical, one categorical for more than two levels)
anv1<- aov(ee$age~ee$decisionmaking)
summary(anv1)

##                    Df Sum Sq Mean Sq F value Pr(>F)
## ee$overallproductivity  3   0.40  0.1376   0.079   0.834
## Residuals            57  81.52  0.9572

#p>0.05 so we accept null hypothesis which explains employee age does not
affected Decision making


#3.
#Does business strategy has association with customer focus strategy for k
nowledge management of an organization
#Null hypothesis:business strategy has no significant association with cus
tomer focus strategy for knowledge management of an organization
#Alternate hypothesis:business strategy has significant association with c
ustomer focus strategy for knowledge management of an organization
#Chi Square Test
chisq.test(km$Businessstrategy, km$Customerfocus)

## Warning in chisq.test(km$Businessstrategy, km$Customerfocus): Chi-squar
ed
## approximation may be incorrect
```

144

```
##
##  Pearson's Chi-squared test
##
## data:  km$Businessstrategy and km$Customerfocus
## X-squared = 46.505, df = 9, p-value = 4.851e-07
```

#p < 0.05 so we accept alternate hypothesis which explains business strategy has significant association with customer focus strategy for knowledge management of an organization

#4.
#Does more age of employee in an organization affects senior leadership management
#Null hypothesis: more age of employee in an organization does not affects senior leadership support for knowledge management

#Alternate hypothesis: more age of employee in an organization does affects senior leadership support for knowledge management

#Anova test(One numerical, one categorical for more than two levels)
```
anv2<- aov(ee$age~km$Seniorleadershipmanagement)
summary(anv2)
```

```
##                              Df Sum Sq Mean Sq F value Pr(>F)
## ee$Seniorleadershipsupport   3   0.70  0.2729    0.19   0.85
## Residuals                   68  84.22  1.4921
```

#p>0.05 so we accept null hypothesis is which explains more age of employee in an organization does affects senior leadership management

#5.
#Does number of years of experience influences the active utilization of self upskilling as a tool for employee engagement
#Null hypothesis:number of years of experience has no influence on the active utilization of self upskilling as a tool for knowledge management
#Alternate hypothesis:number of years of experience has influence on the active utilization of self upskilling as a tool for knowledge management
#Anova test(One numerical, one categorical for more than two levels)
```
anv3<- aov(ee$Exp~ee$Selfupskilling)
summary(anv3)
```

```
##                    Df Sum Sq Mean Sq F value Pr(>F)
## ee$Selfupskilling   3   1.79  0.5974   0.417  0.742
## Residuals          58  83.13  1.4332
```

#p>0.05 so we accept null hypothesis which explains number of years of experience has no influence on the active utilisation of self upskilling as a tool for knowledge management

#6.

```
#Is constructive feedback has better association with customer oriented se
rvice for driving engagement in the organization
#Null Hypothesis:constructive feedback has no better association with cust
omer oriented service for driving engagement in the organization
#Alternate Hypothesis: constructive feedback has better association with c
ustomer oriented service for driving engagement in the organization
#Chi Square Test
chisq.test(km$Constructivefeedback, km$Customerservice)
```

```
## Warning in chisq.test(km$Constructivefeedback, km$Customerservice): Chi
-squared
## approximation may be incorrect
```

```
##
##  Pearson's Chi-squared test
##
## data:  km$Constructivefeedback and km$Customerservice
## X-squared = 47.736, df = 12, p-value = 3.475e-06
```

```
#p<0.05 we reject null hypothesis and accept alternate hypothesis which ex
plains constructive feedback is better than customer oriented service for
driving engagement in the organization
```

```
#7.
#Does age of an employee affect productivity of an organisation
#Null Hypothesis:age of an employee has no significant affect on productiv
ity of an organisation
#Alternate Hypothesis:age of an employee has significant affect on product
ivity of an organisation
#Anova test(One numerical, one categorical for more than two levels)
anv4<- aov(ee$Age~ee$overallproductivity)
summary(anv4)
```

```
##                          Df Sum Sq Mean Sq F value Pr(>F)
## ee$overallproductivity  3     59   19.66   0.827  0.484
## Residuals               58   1379   23.77
```

```
#p>0.05 so we accept null hypothesis which explains age of an employee has
no significant affect on productivity of an organisation
```

```
#8.
#Does age affect when employee worked on virtual platform
#Null Hypothesis: age is not affect when employee worked on virtual platfo
rm
```

```
#Alternate Hypothesis: age affect when employee worked on virtual platform
```

```
#Anova test(One numerical, one categorical for more than two levels)
anv5<- aov(ee$age~ee$Virtualplatformexp)
summary(anv5)
```

```
##                        Df Sum Sq Mean Sq F value Pr(>F)
## ee$Virtualplatformexp  3   2031   677.2   1.323  0.276
## Residuals              58  29680   511.7
```

```
#p>0.05 so we accept null hypothesis which explains age is not affect when
employee worked on virtual platform




#9
#Does Age affect Constructive Feedback for Employee engagement?
#Null Hypothesis: Age does not affect Constructive Feedback for Employee e
ngagement
#Alternate Hypothesis: Age affect Constructive Feedback for Employee engag
ement
anv7<- aov(ee$Exp~ee$Constructivefeedback)
summary(anv7)

##                         Df Sum Sq Mean Sq F value Pr(>F)
## ee$Constructivefeedback  4   4.09  0.7859   0.629  0.678
## Residuals               53  89.33  1.7811

#p>0.05 so we accept null hypothesis which explains Age does not affect Co
nstructive Feedback for Employee engagement
```

Conclusion:

- Age of employee in present organization not influences Employee Engagement
- Employee age does not affected Decision making
- Business strategy has significant association with customer focus strategy for knowledge management of an organization
- More age of employee in an organization does affects senior leadership management
- Number of years of experience has no influence on the active utilization of self upskilling as a tool for knowledge management
- Constructive feedback is better than customer oriented service for driving engagement in the organization
- Age of an employee has no significant affected on productivity of an organization
- Age is not affect when employee worked on virtual platform
- Age does not affect Constructive Feedback for Employee engagement

As you know by now, employee engagement is essential for every workplace. So, what are your next steps to ensuring your people are feeling like their work matters?

Mode of Transportation Used by People

Submitted By-
Utkarsh Kumar Gupta
Diti Ghosh
Reshma Chaudhary

Introduction:

Our topic is "Mode of transportation used by people". We chose this topic because we can survey almost anyone who is studying or working and use a transportation mode to commute to work, even it is be walking. We have created a questionnaire for collect the data, which can gain valuable insights and make our analysis with R. We want data insights on things like which mode of transportation is most common in a metropolitan's city, which mode of transports costs less, how many percentages of people use public transport.

Methodology:

We have created a Google form to collect the data. We have used primary data only in our research. We have used quantitative data (expressed in numbers) and qualitative data (expressed in words) both in our research. Multiple choice options and Likert scale have been used in collecting data to make it easy for our research. We have used different type of research methodology to know about research our research analysis.

These following questions have been asked in Google form:

1. Where do you live?
2. Type of Accommodation?
3. What is most preferred transport method?
4. Do people use Private 4-Wheeler frequently?
5. Do people use Private Bike frequently?
6. Do people use 3 or 4-wheeler rental services like Ola or Uber frequently?
7. Do people use Rental Bike or Scooty like Bounce or Vogo frequently?
8. Do people use private or rental cycle frequently?

9. Does people walk frequently for work purpose?
10. If people have enough time will they prefer walk rather than using vehicle for work?
11. If people will have enough money will they buy expensive and luxurious vehicle?
12. Do people are happy with their current daily transportation mode?
13. Do people feel their daily travelling, expensive?
14. What preference people will have when buying new vehicle?
15. Mode of transport use by people to commute to work?
16. How many bikes do one have at home?
17. How many 4-wheelers do one have at home?
18. How many Bicycle do one have at home?
19. On average, monthly how much money do everyone spend to travel to work? (include fare charges, petrol/diesel. vehicle servicing) in Rupees?
20. On average, monthly how many times people use rental services? (Ola, Uber, Rapido, Bounce, Vogo etc.)?

After collecting the data, we input the dataset in excel file and converted into .Csv file. After converting the dataset inti csv file, we imported the dataset into R to doing our analysis.

Hypothesis Testing:

We used different hypothesis testing to do our analysis like two sample t- test, ANNOVA test and Chi-square test. We also used mosaic graph chart and Stacked bar chart in our analysis.

These following questions we have been analyzed in our project.

1. Does gender affect use of Private 4-Wheeler frequently?

2. Does gender affect use of Private Bike frequently?

3. Does gender affect use of 3 or 4-wheeler rental services frequently?

4. Does gender affect use of Rental Bike or Scooty frequently?

5. Do mode of transportation effect number of bikes at home?

6. Do mode of transportation effect number of "4-wheeler at home? Does gender affect use of private or rental cycle frequently?

7. Does gender affect use of private or rental cycle frequently?

8. Does mode of transport affect type of new vehicle preferred by people?

9. Does having preference for type of new vehicle have effect on happiness of current daily transportation mode?

10. Mosaic Plot on Location and Transportation preference.

t1
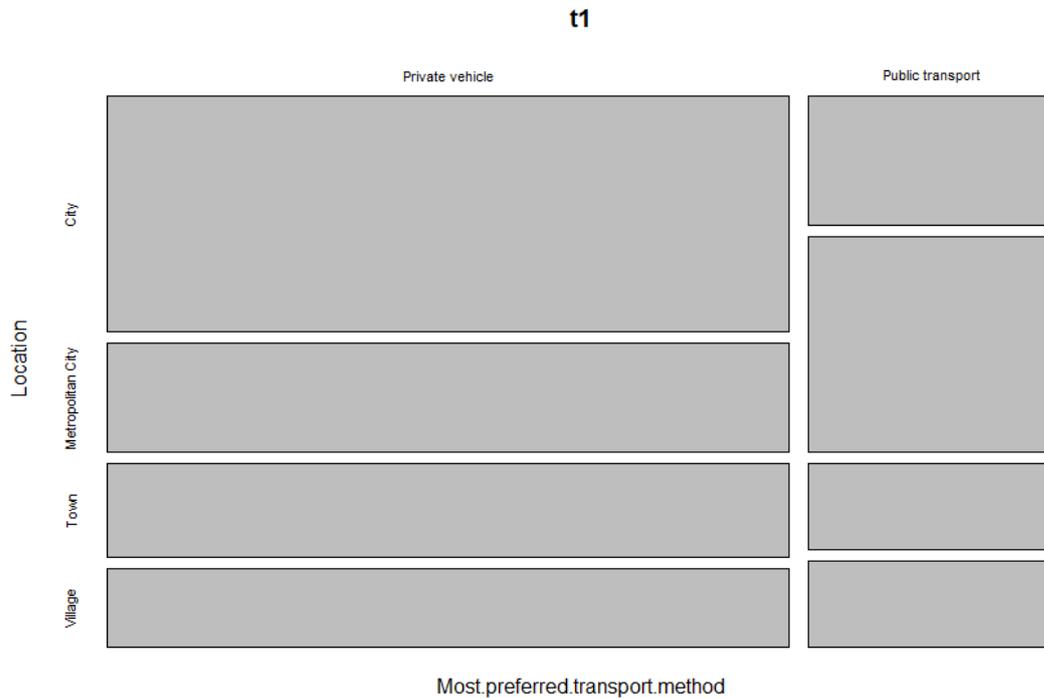

```
> t1= table(Most.preferred.transport.method,Location)
> t1
                                Location
Most.preferred.transport.method City Metropolitan City Town Village
            Private vehicle    15                7   6       5
            Public transport    3                5   2       2
> mosaicplot(t1)
>
```

11. Construct a bar plot to show how people of different occupation use different transport methods.

```
>
>
>
>
>
>
>
>
>
>
>
>
>
>
>
>
>
>
>
> t2 = table(Most.preferred.transport.method, Occupation)
>
> t2
                             Occupation
Most.preferred.transport.method Other Student Unemployed
              Private vehicle     0     32        1
              Public transport    1     11        0
> barplot(t2, legend.text = T)
```
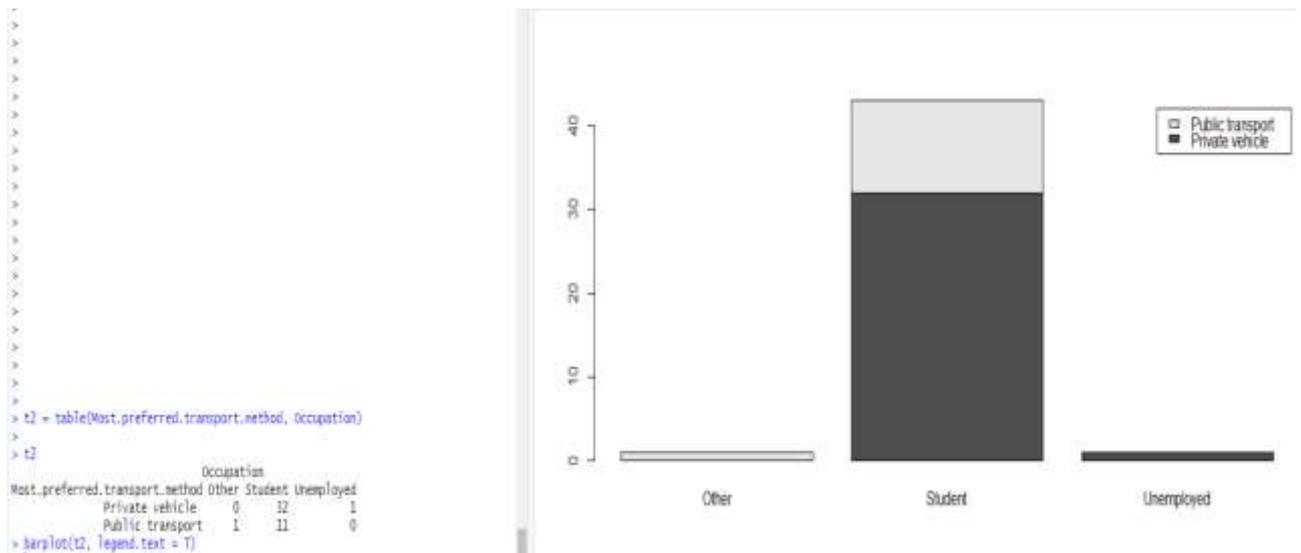
Interpretation:

1) First question is "Does gender affect use of private 4-wheeler frequency?". To analysis the question we used t- test here, in output p value is greater than 0.05, so we accept null hypothesis and analyzed that gender affect use of private 4- wheeler.

2) 2nd question is "Does gender affect use of private Bike frequency?" In output we can see p value is greater than 0.05 so we can conclude that Gender affect use of private bike frequency.

3) 3rd question is "Does gender affect 4- wheeler rental services frequency?" In output we can see that p value is more than 0.05 so we accept alternative hypothesis and analyzed that Gender affect 4-wheeler rental services frequency.

4) 4th question is "Does gender affect use of Rental Bike or Scooty frequency?" In output we can see that p value is more than 0.05, hence we fail to reject null hypothesis. We can say that Gender does not affect use of rental bike or scooty service.

5) 5th question is "Do mode of transportation affect number of bikes at home?" here we used two sample t- test, in output we can see that p value is greater than 0.05 so we fail to reject null hypothesis and can conclude that mode of transportation do not affect no of bikes at home.

6) 6th question is "Do mode of transportation effect number of 4-wheeler to home? Does gender affect use of private or rental cycle frequency?" Output of this question p value is greater than 0.05 so mode of transportation does not affect no of 4- wheeler at home.

7) 7th question is "Does gender affect use of private or rental cycle?" After using t- test we can see that p value is greater than 0.05 so here Gender does not affect use of private or rental cycle.

8) 8th question is "Mosaic Plot on Location and Transportation preference." From the graph we can analyses that in metropolitan city most preferred transportation mode is private vehicle

9) 9th question is "Construct a bar plot to show how people of different occupation use different transport methods." From the graph we can say that students mostly use private transports.

Conclusion:

We have run few tests and we conclude the followings-

1) After analyzing our data in R, we can conclude that in metropolitan city and in town mostly preferred transportation mode is private transport and in village area they are preferred public transport.
2) Mode of preferred transport affect no of bike and cars.
3) Gender affect 4-wheeler rental services frequency and also gender affect use of private 4- wheeler
4) students mostly use private transports.
5) mode of preferred transportation does not affect no of 4- wheeler at home.

After analysis we have learnt lots of things and we are getting ideas like transportation mode preferred gender wise, which transportation mode is commonly preferred and which is low cost transportation.

REAL WORLD.
REAL LEARNING.

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