

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

Submitted By-
Mahaveer
Shamali
Somya
Saumya
Anand

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?

LIVE PROJECT- Introduction to R

```
#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
```

LIVE PROJECT- Introduction to R

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(mt$Sex,mt$Which.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(mt$Sex,mt$Which.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-
Maheshwaran
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 respect 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.

```
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)

##
## corona$Major.Source.of.Income      Df      Sum Sq   Mean Sq F value Pr(>F)
## 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)

##
## corona$Region      Df      Sum Sq   Mean Sq F value Pr(>F)
## 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 tendency of people who store groceries?
# Ho: Region does not has an effect on the tendency of people who store
groceries.
# H1: Region has an effect on the tendency 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 tendency 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$X.Do.you.agree.that.Mental.Health.of.the.people.has.improved.in.this.lock.down.period... 2.611
## Residuals
##
Pr(>F)
##
corona$X.Do.you.agree.that.Mental.Health.of.the.people.has.improved.in.this.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.than.going.to.the.workplace...)

## Warning in chisq.test(corona$Region,
##
corona$X.Do.you.prefer.Working.from.home.rather.than.going.to.the.workplace...):
## 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.workplace...
## 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.workplace...)
summary(sta)

##
Df
##
corona$X.Do.you.prefer.Working.from.home.rather.than.going.to.the.workplace... 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 0.8049, 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.

```

```

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

```

```

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.

```

```

# 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 ?

```

```

# 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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Garima (PG 19048)
Nicole Fernandes (PG 19081)

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.

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

LIVE PROJECTS- Introduction to R

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

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

levels(gender)

## [1] "Male" "Female"

occupation=factor(a$Occupation.,levels = c("Business","Employed","Other","Student"))
occupation

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

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```
## [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("Personal 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", "Disagree", "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

```

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```
## [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 Agree"))
```

```
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
```

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```
## [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
```

```
levels(motivation2)
```

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

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

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```
## [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 Disagree",
"Disagree","Neutral","Agree","Highly Agree"))
```

```
motivation4
```

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

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```
## [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

```

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```
## [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
```

```
levels(motivation5)
```

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

```
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
```

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```
## [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
```

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```
## [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("Highly 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
```

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```
## [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
```

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```
## [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
```

LIVE PROJECTS- Introduction to R

```
## [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
```

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```
## [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
```

```
levels(problem5)
```

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

```
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
```

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```
## [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
```

`levels(problem6)`

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

```
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
```

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```
## [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
```

LIVE PROJECTS- Introduction to R

```

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

```

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```
## [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
```

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```

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

levels(aspect1)

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

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
```

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```
## [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
```

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```
## [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

levels(aspect3)

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

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

```

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```

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", "Consumer 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
```

LIVE PROJECTS- Introduction to R

```

les
## [133] Cosmetics      Electronics      Footwear         Accessories
## [137] Books          Footwear        Consumer Durables Electronics
## [141] Home Appliances Books          Consumer Durables Home Appliances
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

levels(product)

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

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

```

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

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

```

```

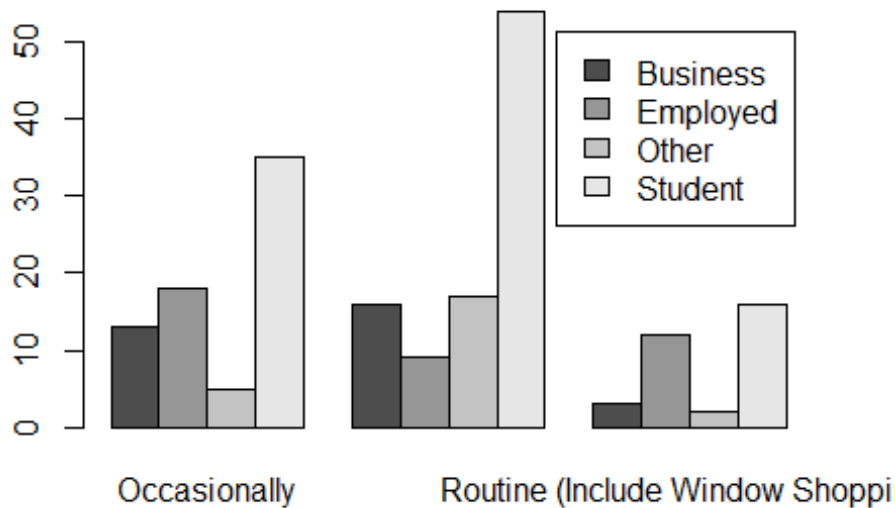
## replicates)
##
## data: occupation and frequency1
## X-squared = 17.883, df = NA, p-value = 0.005997

# P-value < 0.05 , Reject Null Hypothesis(Ho)
# There is an association between occupation and their frequency of online shopping
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 market)
## 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 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
```

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```
##      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.goods.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 with 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 available at stores.

```
f=a$The.main.motivation.behind.using.an.E.commerce.Platform...Some.products.are.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 of 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.products.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.different.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

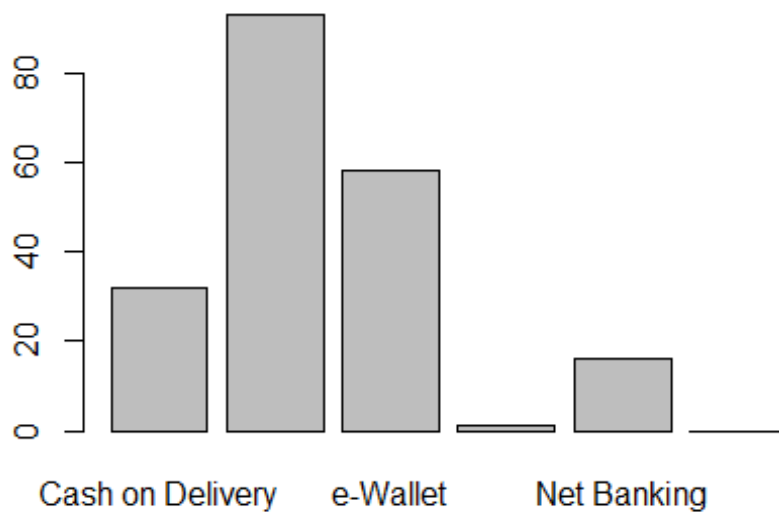
Q6) Which online payment mode is the preferred by the people?

```
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

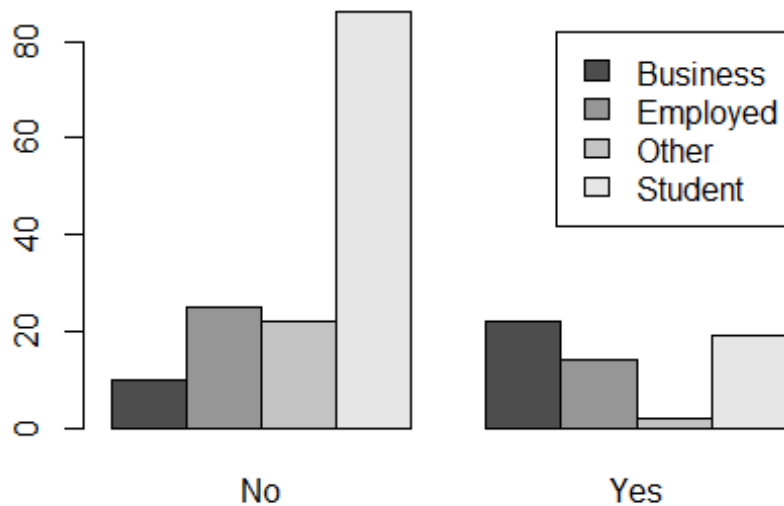
Q7) Does occupation affect preference of checking offline shops before making an online purchase?

#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.making.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.making.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.

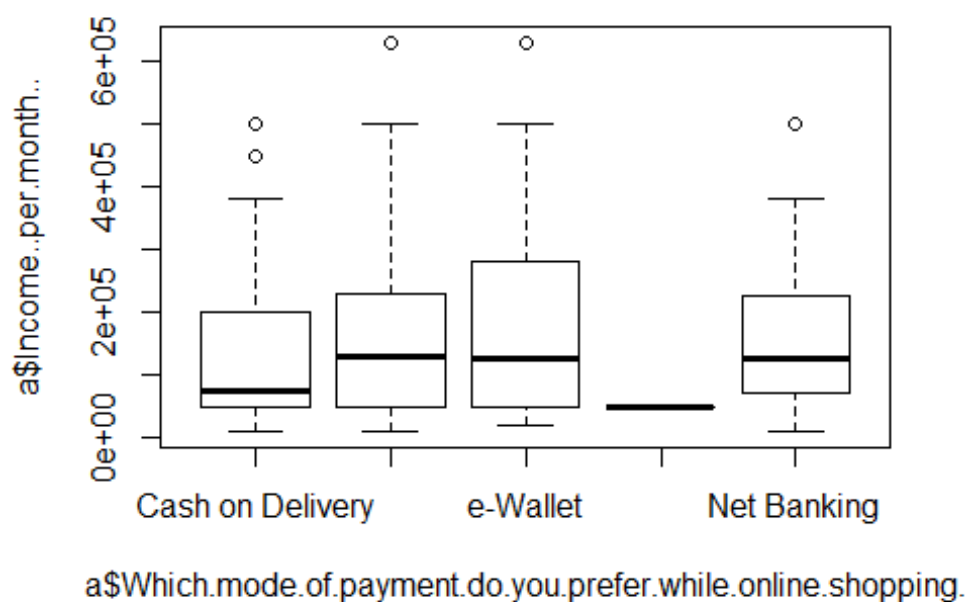
Q8) Does income affect mode of payment?

#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.online.shopping.)
summary(pay)
```

```
##                                     Df    Sum Sq
## a$Which.mode.of.payment.do.you.prefer.while.online.shopping.    4 3.196e+10
## Residuals                                     195 4.446e+12
##                                     Mean Sq F value
## a$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.online.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

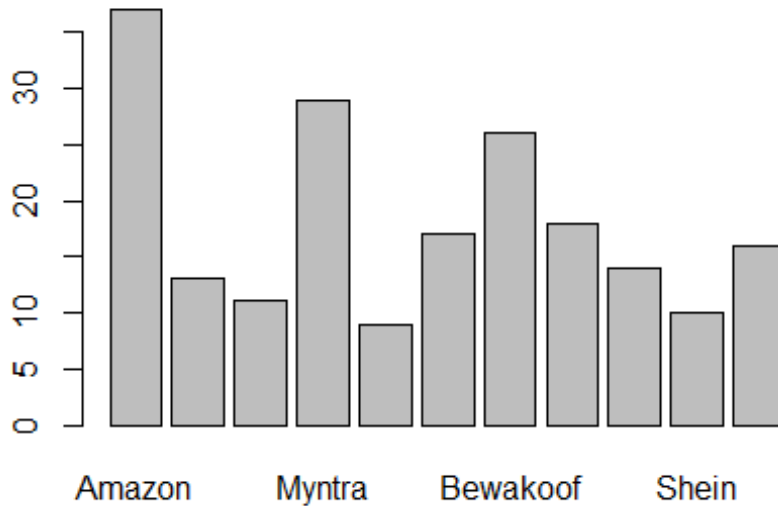
Age has an influence on mode of payment. The mode of payment preferred depends on the age of the person.

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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Arindam Debnath (PG19025)
Abhirupa Maiti (PG19004)

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 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 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 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
```

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```

: 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
```

LIVE PROJECTS- Introduction to R

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

LIVE PROJECTS- Introduction to R

```
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","Health 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","Govt 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","Semi 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$Region.of.Stay,coa$Washing.hands.regularly.with.soap.hand.wash)
```

Output:

```
> chisq.test(coa$Region.of.Stay,coa$Washing.hands.regularly.with.soap.hand.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 hypothesis

#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

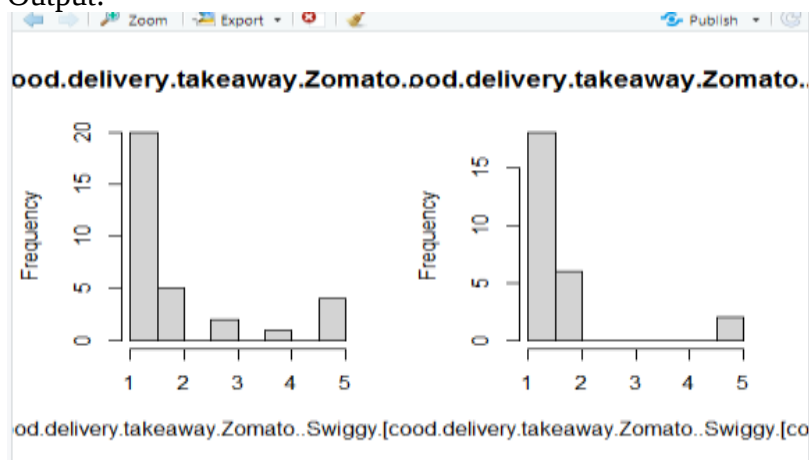
To understand better if there is any decrease in buying food from outside for male population than female, we use histogram

```
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.of.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

Null hypothesis: people are not avoiding social gathering

Alternative hypothesis: 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.crowded.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:

Null Hypothesis Testing- 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$i..Large.business.corporation.will.be.affected, coa$Region.of.Stay)
```

Pearson's Chi-squared test

data: coa\$i..Large.business.corporation.will.be.affected and coa\$Region.of.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$v..Small.business.corporation.will.be.affected, coa$Region.of.Stay)
```

Pearson's Chi-squared test

```
data: coa$v..Small.business.corporation.will.be.affected and coa$Region.of.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$How.has.your.use.digital.payment.apps..like.paytm..google.pay..amazon.pay.e
tc...changed.in.the.last.10.15.days., coa$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$iii..Out.of.home.entertainment.movies.pubs..restaurant.etc.. and
coa$Region.of.Stay
X-squared = 12.859, df = 16, p-value = 0.683
```

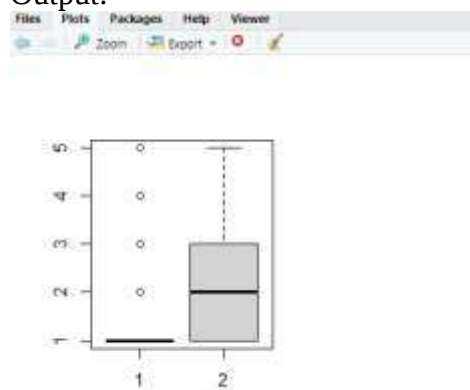
Interpretation:

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$iii..Out.of.home.entertainment.movies.pubs..restaurant.etc.., coa$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.of.Stay)
```

Pearson's Chi-squared test

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

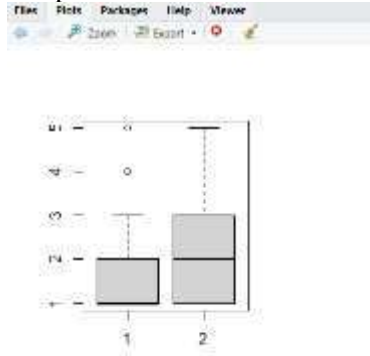
Interpretation:

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
```

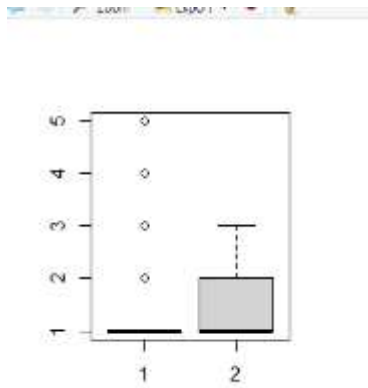
Interpretation:

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" "2020/07/07 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" ...
```

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```
## $ 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
```

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```
##
##
##
## 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
##
>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.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.,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
```

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#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.organizations.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	

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

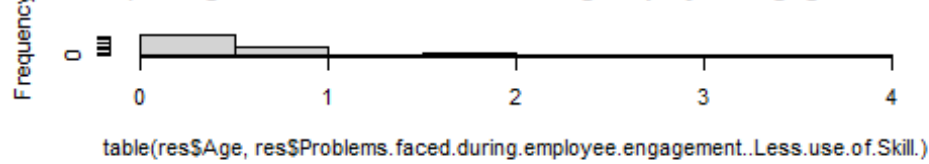
#Since p value is less than 0.05 therefore we accept the alternate hypothesis #Hence there is a significant impact of age with regards to change in motivation due to Covid

****Data Visualisation****

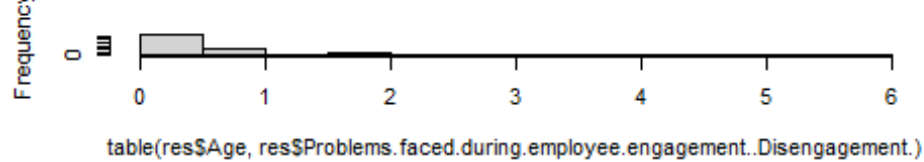
Here , we have represented Age along with problems faced during employee engagement in order to understand how different age people faced different problems in employee engagement which we represented in the form of histogram .On viewing our data, we saw that there is not one aspect that is relevant 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..Disengagement.))
hist(table(res$Age,res$Problems.faced.during.employee.engagement..Remote.working.))
```

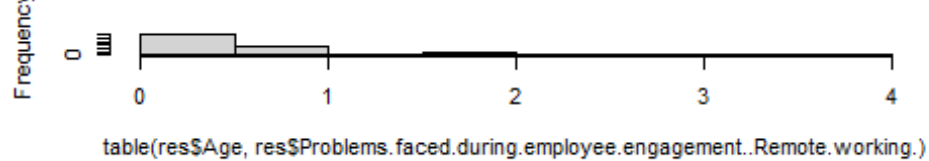
n of table(res\$Age, res\$Problems.faced.during.employee.engagement..Less



n of table(res\$Age, res\$Problems.faced.during.employee.engagement..Dise



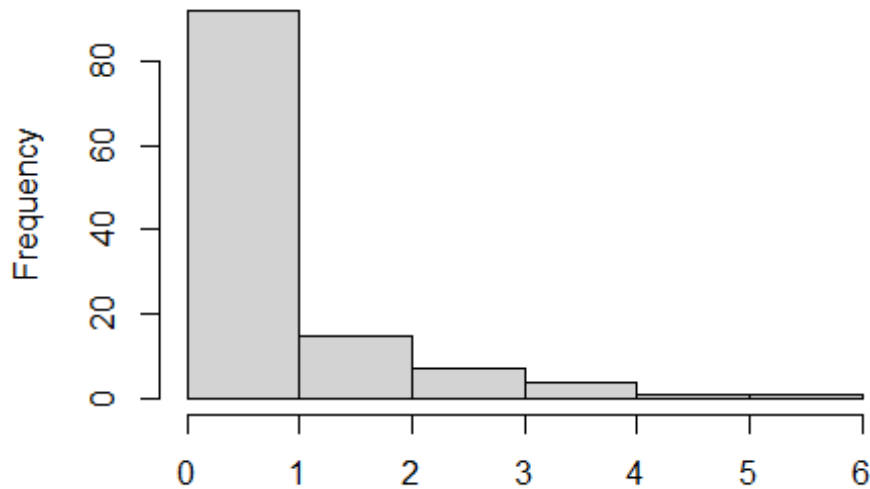
n of table(res\$Age, res\$Problems.faced.during.employee.engagement..Rem



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.affecti
```



```
ge, res$Workplace.Culture.is.an.important.factor.affecting.the.Empl
```

****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) Organisational 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 employment. 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>.

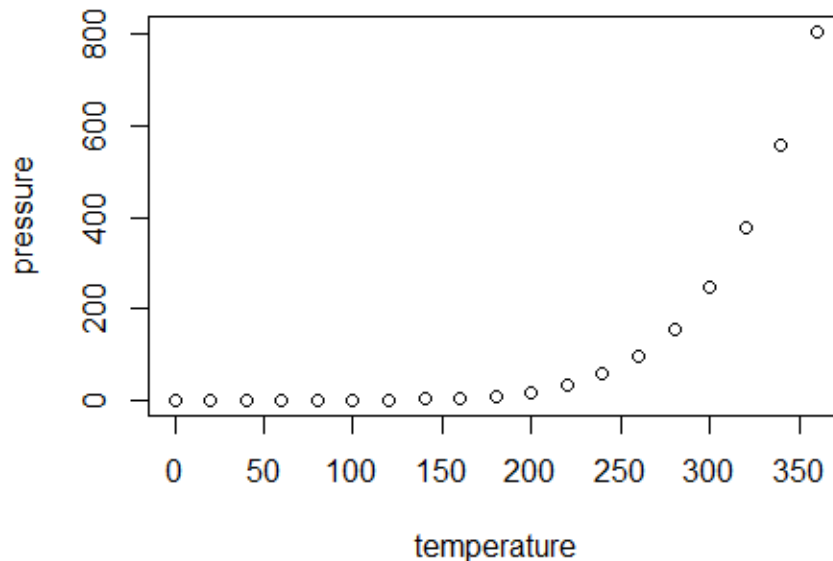
When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
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-
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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
##
##
##

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

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

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

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

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

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

levels(x)

## [1] "Male" "Female"

class(x)

## [1] "ordered" "factor"

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

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

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

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

class(y)

```

```

## [1] "ordered" "factor"

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

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

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

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

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

levels(a)

## [1] "YES" "NO"

class(a)

## [1] "ordered" "factor"

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

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

levels(b)

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

class(b)

## [1] "ordered" "factor"

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

## [1] "ordered" "factor"

levels(f)

## character(0)

StudentInteraction=as.factor(c("Not at all important","Not too
important","Somewhat important", "Very important", "Extremely
important")) StudentInteraction

## [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=as.factor(StudentInteraction, order= TRUE, levels = c("Not at all
important", "Not too important","Somewhat important", "Very important",
"Extremely important"))
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=as.factor(Real_virtual, order = TRUE,levels=c("Real classroom",
"Virtual classroom"))
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 family.

```

```

# 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 on 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 connection with instructors.

#Chi Square Test (Two Categorical variables)

```
chisq.test(Covid$Student.Interaction,Covid$Connection.with.instructors)
```

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

```
##
```

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

```
##
```

```
## data: Covid$Student.Interaction and
Covid$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 impact on concerns of students.

#Alternate Hypothesis: Disruption in traditional schooling has significant impact 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.Interaction)
```

```
## Warning in chisq.test(Covid$Gender, Covid$Student.Interaction):
Chi-squared
```

```
## 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 affect 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-Learning.
#Alternate Hypothesis: Age has an impact on how prepared students are
for e-Learning.
#Chi Square Test (Two Categorical variables)
chisq.test(Covid$Age,Covid$Preparation)

## Warning in chisq.test(Covid$Age, Covid$Preparation): Chi-squared
approximation
## 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 educational qualification.

#Chi Square Test (Two Categorical variables)

```
chisq.test(Covid$College.Updates,Covid$Educational.Qualification)
```

```
## Warning in chisq.test(Covid$College.Updates, Covid$Educational.Qualification):
```

```
## 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 qualification.

#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-
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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 permissible 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:

```
getwd()
```

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

```
setwd("C:/Users/Sanjana/Desktop/ISBR")
```

```
rhd=read.csv("Analysis of risk of heart diseases.csv")
```

```
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

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
```

#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 significant t
# influence on risk of heart disease
# Since Veg/non-veg is categorical (2 levels) and total number is numeric, # we use t.test
```

```
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

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

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 use t.test
```

```
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=aoov(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 disease
# 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 roles
#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 approximation
## may be incorrect

##
## Pearson's Chi-squared test
##
## data: cat$Work.Role and cat$Your.View.on.Job..Lack.of.Job.Security.is.there.
## 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 different 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.Hours.):
## 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( $H_0$ ): Long working hours does is not related to Job security,
i.e.  $\mu_1 = \mu_2$ 
# Alternate hypothesis( $H_1$ ): 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.)

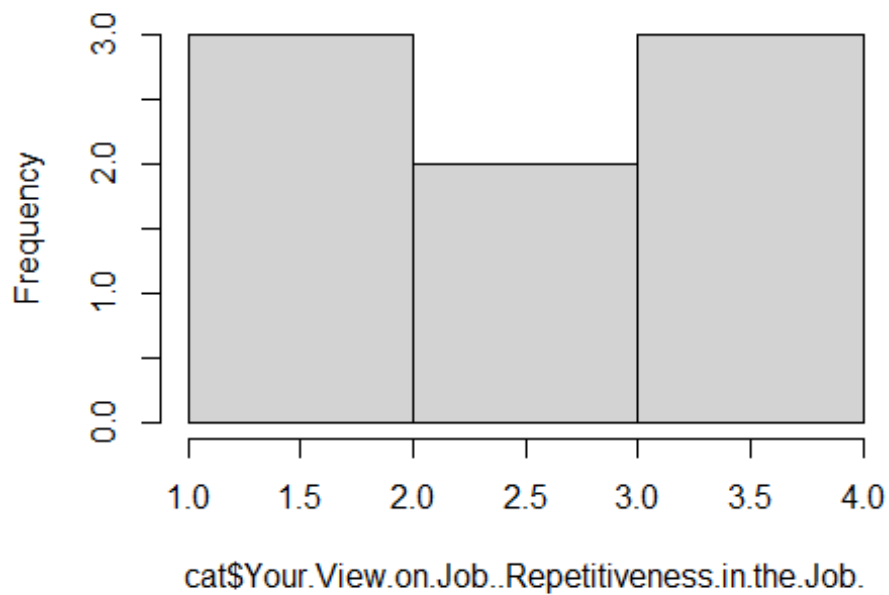
## Warning in chisq.test(cat$Your.View.on.Job..Long.Working.Hours.,
## cat$Your.View.on.Job..Lack.of.Job.Security.is.there.): Chi-squared approxi
mation
## may be incorrect

##
## 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.

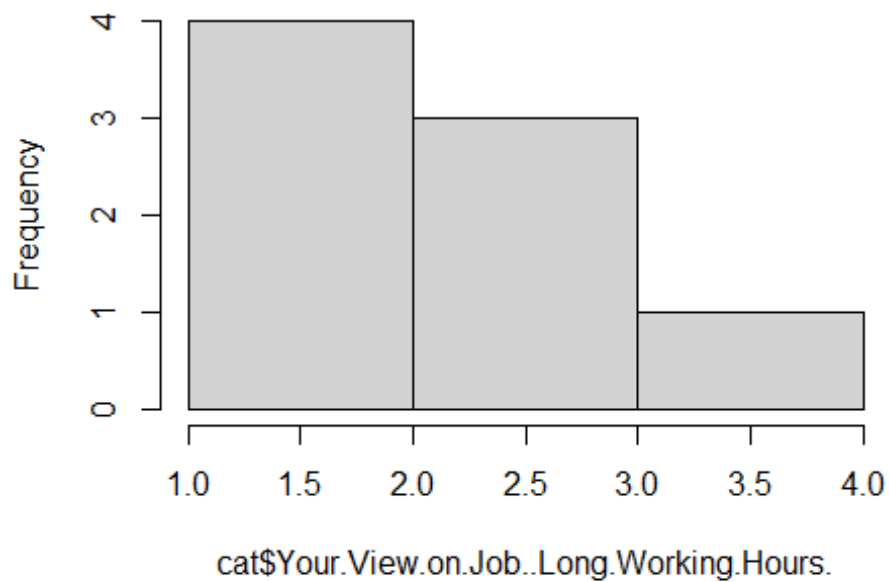
hist(cat$Your.View.on.Job..Repetitiveness.in.the.Job.)
```

histogram of cat\$Your.View.on.Job..Repetitiveness.in.the.Job.



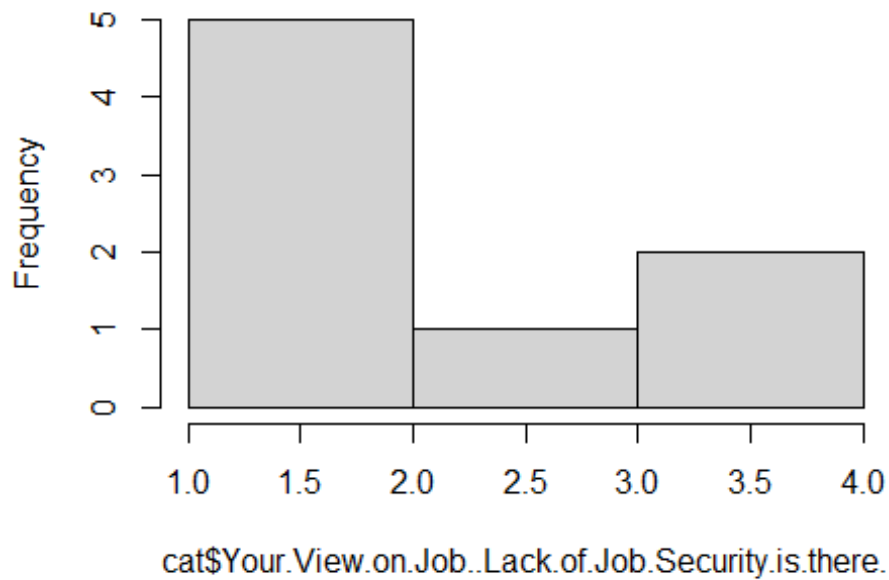
```
hist(cat$Your.View.on.Job..Long.Working.Hours.)
```

histogram of cat\$Your.View.on.Job..Long.Working.Hours.



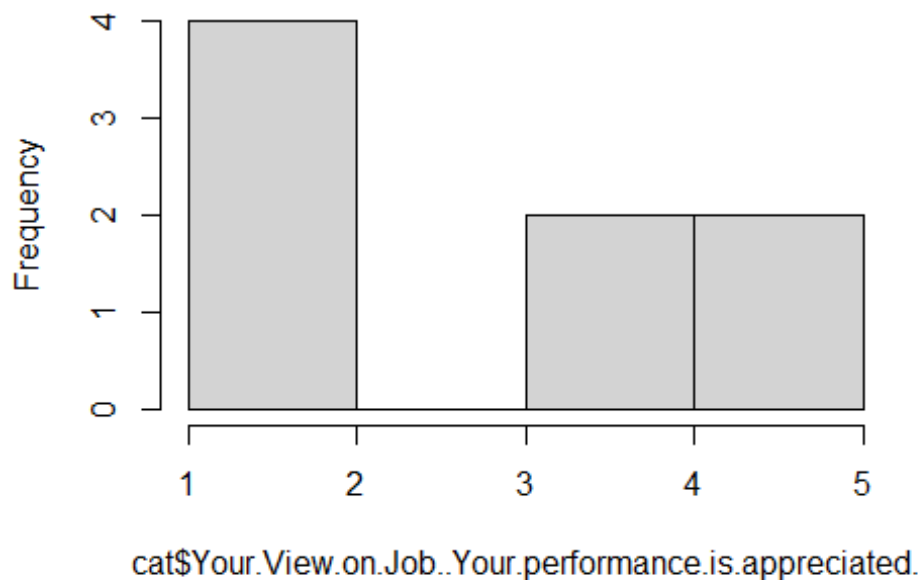
```
hist(cat$Your.View.on.Job..Lack.of.Job.Security.is.there.)
```

rogram of cat\$Your.View.on.Job..Lack.of.Job.Security



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

rogram of cat\$Your.View.on.Job..Your.performance.is.a



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>.

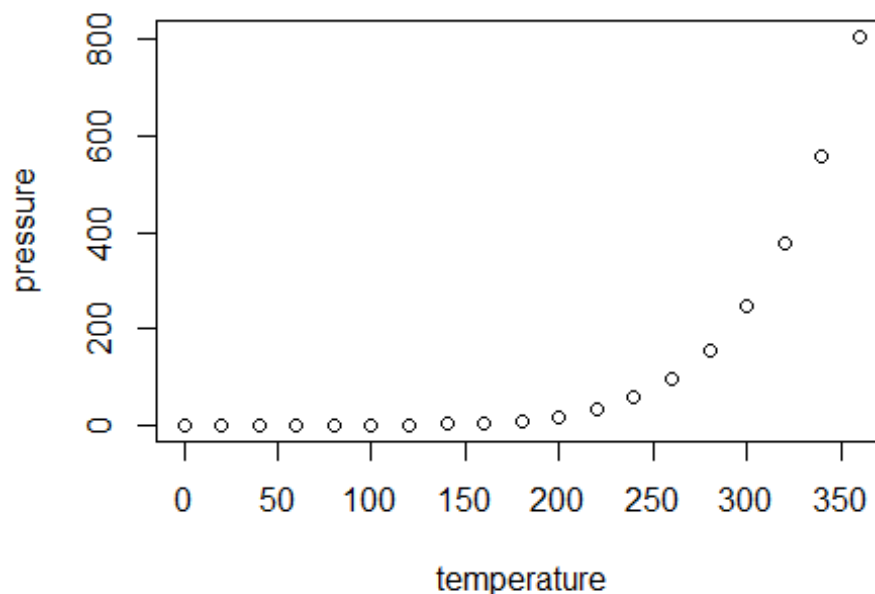
When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
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

```
getwd()

## [1] "F:/ISBR/rscript/project"

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

summary(mar)

##  Name.optional.      City      Gender      Age
##  Length:79          Length:79    Length:79    Length:79
##  Class :character    Class :character  Class :character  Class
##  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...1.1
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...1.1
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...1.1
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

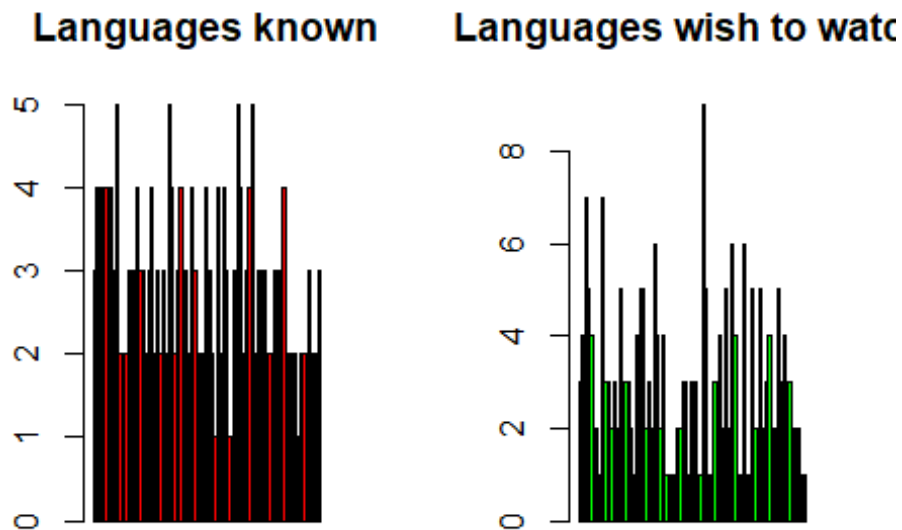
table(mar$Age,mar$Gender,mar$Occupation)

## , , = 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

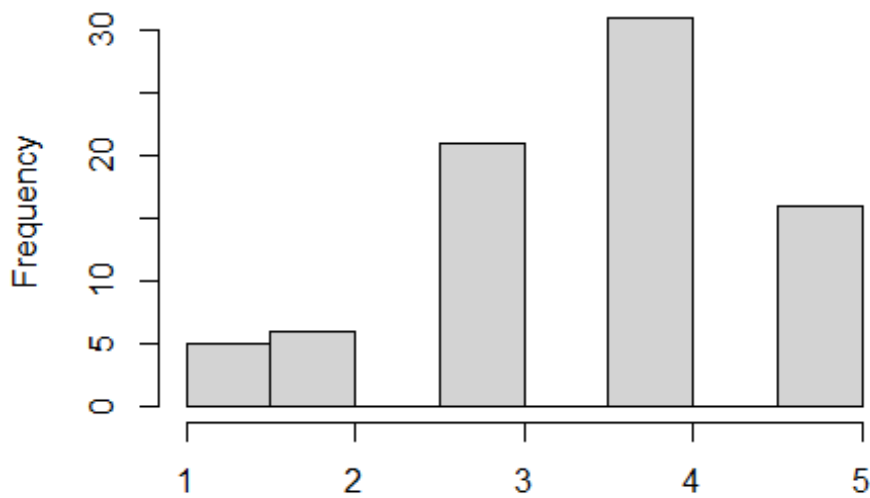
```
par(mfrow=c(1:2))
barplot(mar$LK, col = "red", main = "Languages known")
barplot(mar$LW, col = "green", main = "Languages wish to watch")
```



*#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.)
```

people.on.you.in.watching.movies.series..1.very.low.infl

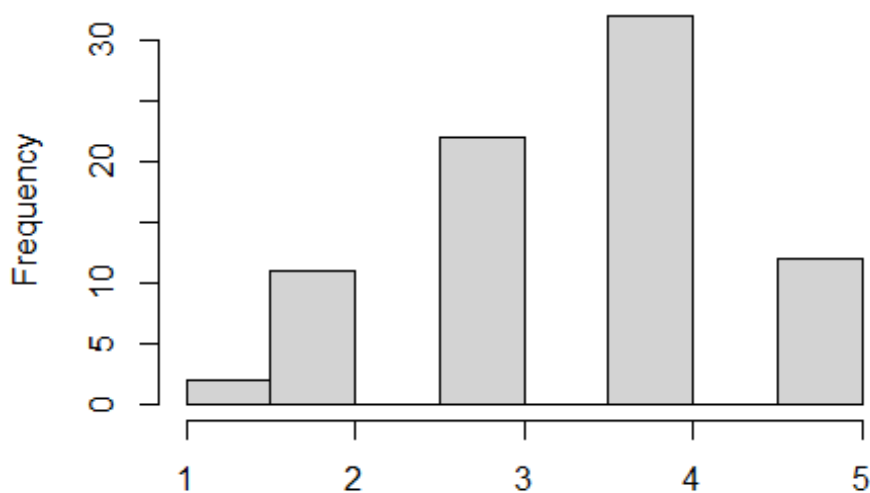


people.on.you.in.watching.movies.series..1.very.low.influence.2.low.in

```
#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

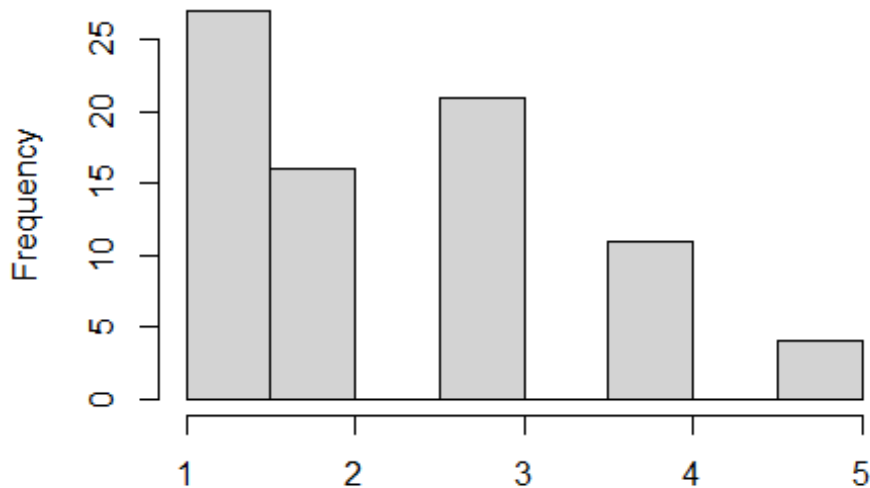


st.of.people.on.you.in.watching.movies.series..1.very.low.influence.2.lo

```
#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.)
```

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

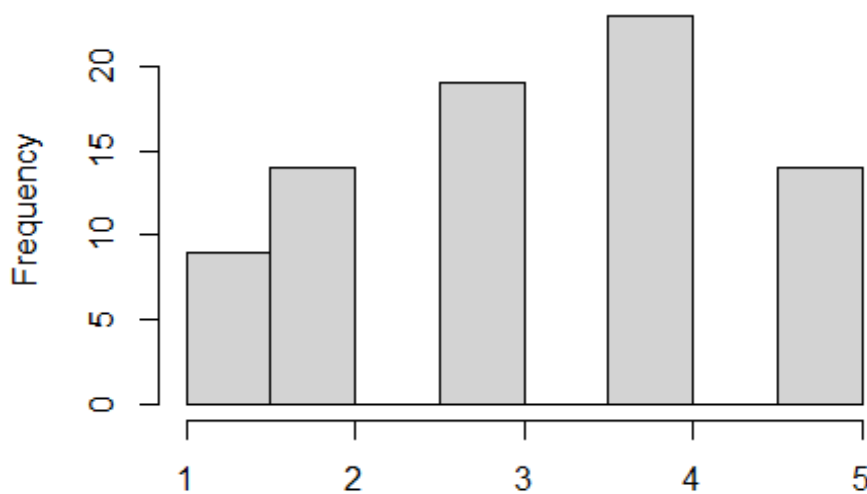


et.of.people.on.you.in.watching.movies.series..1.very.low.influence.2.lo

```
#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.)
```

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



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

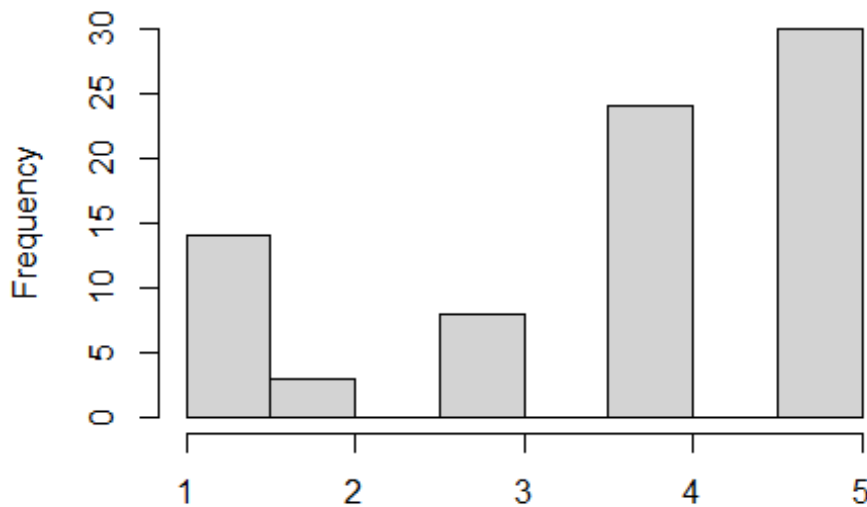
```
#FREQUENCY USAGE OF ONLINE PLATFORMS
#NETFLIX
```

```
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.)
```

j.movies.series.in.online.streaming.OTT...1.least.pre



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

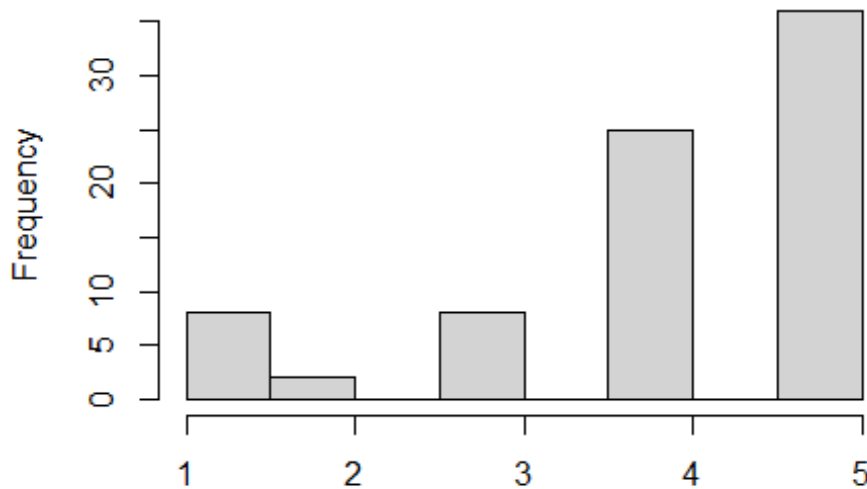
```
#FREQUENCY USAGE OF ONLINE PLATFORMS
#AMAZON PRIME
```

```
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

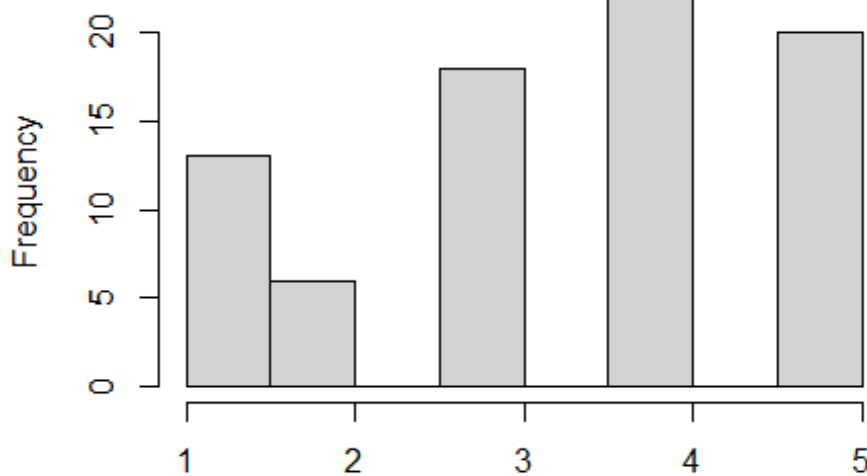
```
#FREQUENCY USAGE OF ONLINE PLATFORMS
#HOTSTAR
```

```
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



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

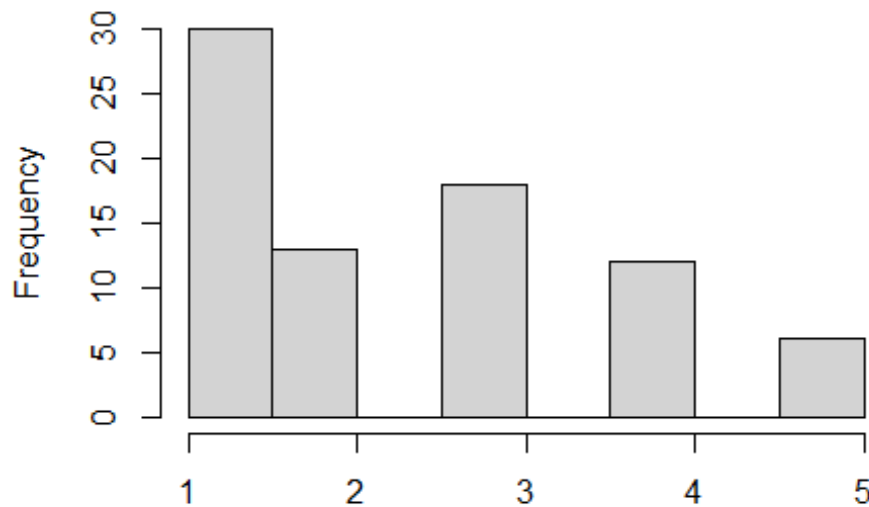
```
#FREQUENCY USAGE OF ONLINE PLATFORMS
#MX PLAYER
```

```
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.pprefer



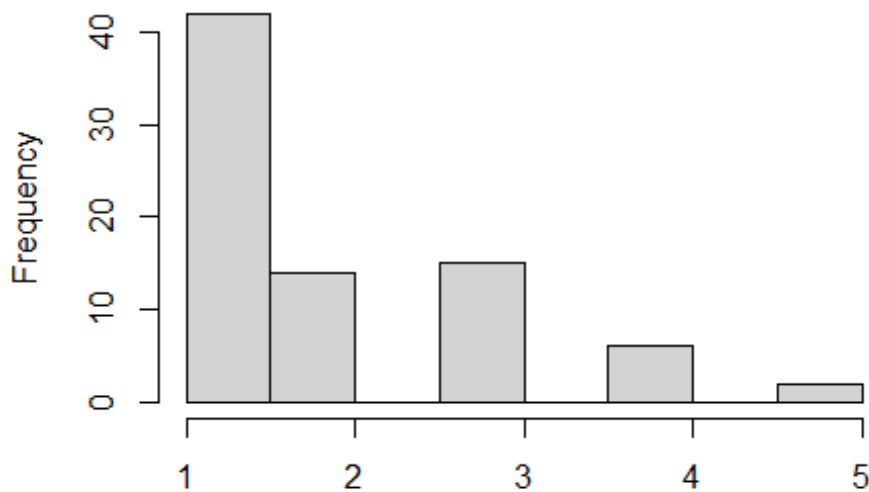
g.movies.series.in.online.streaming.OTT...1.least.preferred.2.slightly.p

```
#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.series.)
```

```
## 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.series.)
```

```
## 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.movies.series.)

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

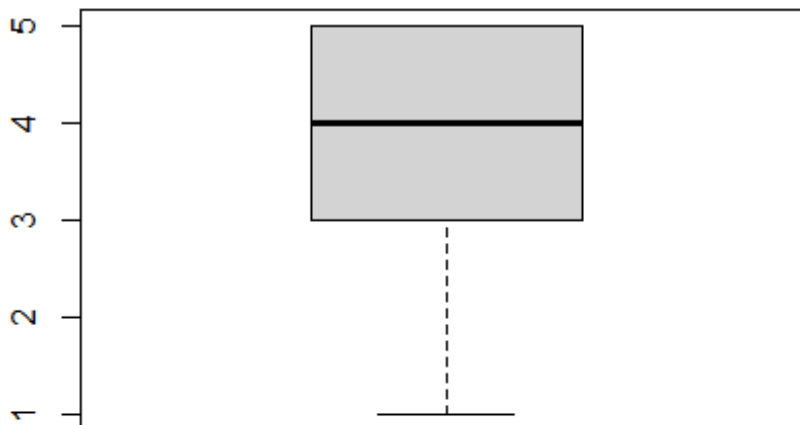
##
## Pearson's Chi-squared test
##
## data: mar$Occupation and
mar$How.much.time.do.you.spend.in.watching.movies.series.
## X-squared = 25.238, df = 25, p-value = 0.4491

#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.preferred.5.very.highly.preferred...Theatres.)

```

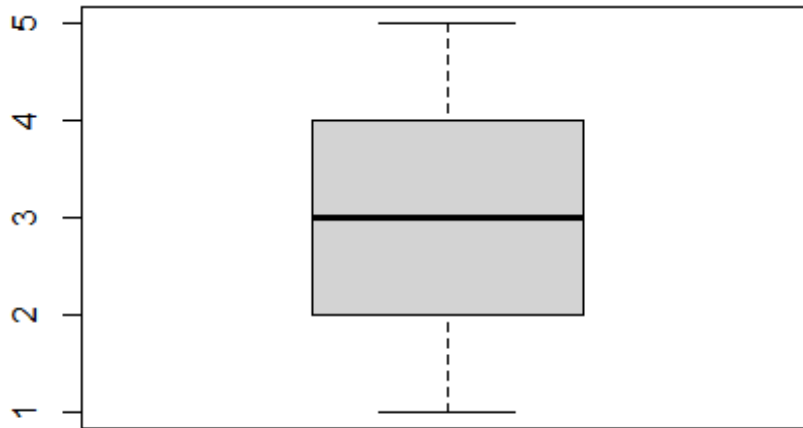


```

#USER PREFERENCE IN WATCHING MOVIES (TELEVISION)

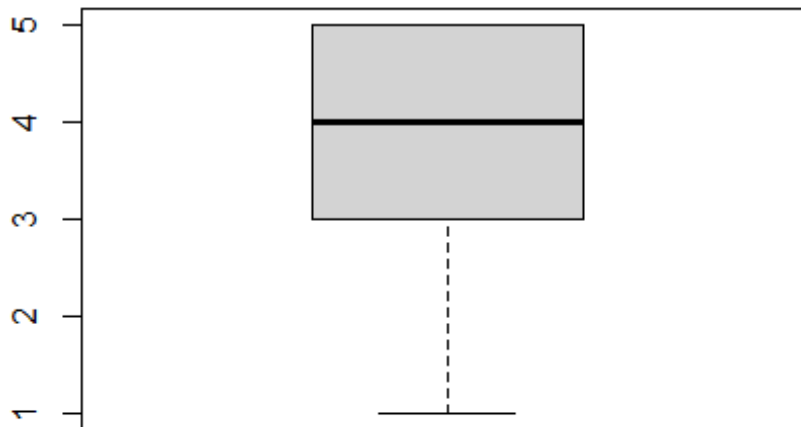
```

```
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 PREFERRED 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>.

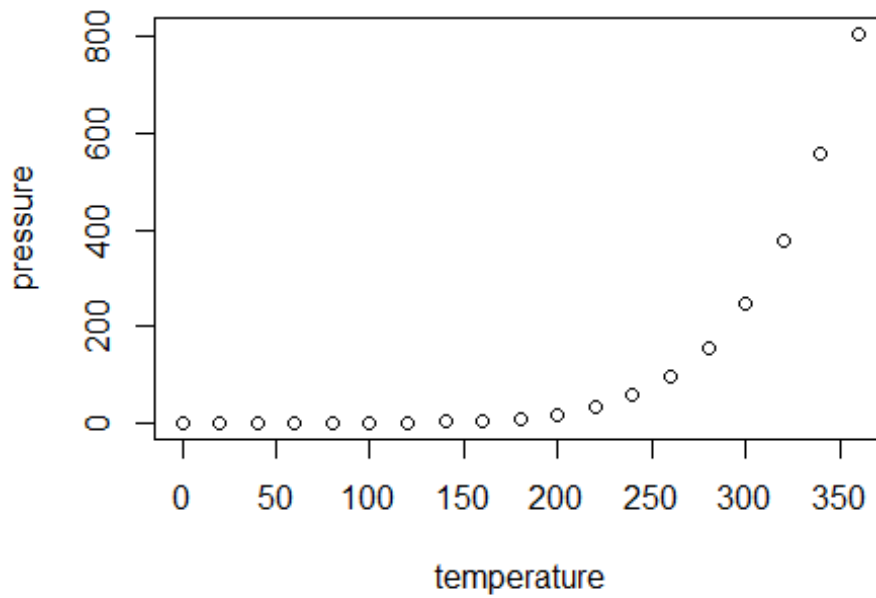
When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
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-
Sunny Singh
Taha Aktar
Sagar Gadhave
Saurav Verma
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:

- Anova 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" "Agree" ...
##  $ libertytoaccess    : chr   "Agree" "Agree" "Disagree" "Strongly Agree" ...
##  $ Virtualplatformexp : chr   "Satisfied" "Satisfied" "Satisfied" "Dissatisfied" ...
##  $ Seniorleadershipsupport: chr   "Agree" "Strongly Agree" "Agree" "Strongly Agree" ...
##  $ Constructivefeedback : chr   "Neutral" "Strongly Agree" "Neutral" "Agree" ...
##  $ Customerservice    : chr   "Neutral" "Strongly Agree" "Disagree" "Strongly Agree" ...
##  $ Newlearning        : chr   "Agree" "Agree" "Agree" "Strongly Agree" ...
##  $ budgetallocation   : int   30 50 30 15 30 15 50 30 30 70 ...
##  $ Businessstrategy   : chr   "Agree" "Agree" "Agree" "Strongly Agree" ...
##  $ Knowledgetransfer   : chr   "Agree" "Agree" "Agree" "Agree" ...
##  $ Customerfocus     : chr   "Agree" "Agree" "Agree" "Strongly Agree" ...
##  $ Selfupskilling     : chr   "Disagree" "Agree" "Neutral" "Strongly Agree" ...
```

```
## $ Improperselection      : chr "Agree" "Agree" "Agree" "Disagree" ...
## $ Technicalproblem       : chr "Strongly Agree" "Strongly Agree" "Agree" "Agree" ...
## $ productivity           : chr "Strongly Agree" "Strongly Agree" "Strongly Agree" "Strongly Agree" ...
## $ KMservice              : chr "Strongly Agree" "Strongly Agree" "Strongly Agree" "Strongly Agree" ...
## $ overallproductivity    : chr "Strongly Agree" "Agree" "Strongly Agree" "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


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

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

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

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

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

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","Disagree",
"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","Neutral",
"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","Agree",
"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","Disagree",
"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","Disagree",
"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 Engagement.
#Null hypothesis: age of employee in present organization not influences Employee 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$Knowledge transfer  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 present 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 knowledge management of an organization
#Null hypothesis: business strategy has no significant association with customer focus strategy for knowledge management of an organization
#Alternate hypothesis: business strategy has significant association with customer 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-squared
## approximation may be incorrect
```

```
##
## 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 strate
gy 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 ma
nagement
#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 affect
s 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 employe
e in an organization does affects senior leadership management

#5.
#Does number of years of experience influences the active utilization of s
elf upskilling as a tool for employee engagement
#Null hypothesis:number of years of experience has no influence on the act
ive utilization of self upskilling as a tool for knowledge management
#Alternate hypothesis:number of years of experience has influence on the a
ctive 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 exp
erience 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 service for driving engagement in the organization
#Null Hypothesis:constructive feedback has no better association with customer oriented service for driving engagement in the organization
#Alternate Hypothesis: constructive feedback has better association with customer 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 explains 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 productivity of an organisation
```

```
#Alternate Hypothesis:age of an employee has significant affect on productivity 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 platform
```

```
#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 engagement

#Alternate Hypothesis: Age affect Constructive Feedback for Employee engagement

```
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 Constructive 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-
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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 into 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?

The screenshot shows the R Studio environment. The script editor contains the following code:

```
# Null Hypothesis : Gender doesn't affect use of private 4 wheeler
t.test(file$Pri4Wh~file$Gender)
# Since p-value is less than 0.05 so we will accept null hypothesis
```

The console output shows the results of the Welch Two Sample t-test:

```
data: file$Pri4Wh by file$Gender
t = -0.18643, df = 18.893, p-value = 0.8541
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -0.6795044  0.5683933
sample estimates:
mean in group 1 mean in group 2
 2.944444      3.000000
```

Below the console output, the user has added a comment:

```
> # Since p-value is less than 0.05 so we will accept null hypothesis
> # Hence there is no affect of gender on using private 4 wheeler
```

The Environment pane on the right shows the 'Data' tab with 'file' (45 obs. of 29 variables) and 'GePri' (List of 12).

2. Does gender affect use of Private Bike frequently?

The screenshot shows the RStudio interface. The script editor contains the following code:

```
# Null Hypothesis : Gender doesn't affect use of private bike frequently
20 t.test(file$PriBi~file$Gender)
21 # Since p-value is greater than 0.05 so we will accept null hypothesis
22
```

The console output shows the results of the Welch Two Sample t-test:

```
data: file$PriBi by file$Gender
t = -1.1496, df = 20.839, p-value = 0.2633
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
-1.170781 0.337448
sample estimates:
mean in group 1 mean in group 2
3.361111 3.777778

> # Since p-value is greater than 0.05 so we will accept null hypothesis
> # Hence there is no affect of gender on using private bike
>
```

The Environment pane on the right shows the 'file' object with 45 observations of 2 variables, and lists 'GePri' and 'Mtra' as lists of 12 and 13 respectively.

3. Does gender affect use of 3 or 4-wheeler rental services frequently?

The screenshot shows the RStudio interface. The script editor contains the following code:

```
# Null Hypothesis : Gender doesn't affect using of 3 or 4 wheeler rental services
27 t.test(file$X3.4whRS~file$Gender)
28 # Since p-value is more than 0.05 so we will accept the null hypothesis
29
```

The console output shows the results of the Welch Two Sample t-test:

```
data: file$X3.4whRS by file$Gender
t = 0.1359, df = 14.25, p-value = 0.8938
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
-0.8197662 0.9308773
sample estimates:
mean in group 1 mean in group 2
3.166667 3.111111

> # Since p-value is more than 0.05 we will accept the null hypothesis
> # Hence there is no effect of gender on using of 3 or 4 wheeler rental services
>
```

The Environment pane on the right shows the 'file' object with 45 observations of 2 variables, and lists 'GePri' and 'Mtra' as lists of 12 and 13 respectively.

4. Does gender affect use of Rental Bike or Scooty frequently?

LIVE PROJECTS- Introduction to R

The screenshot shows the RStudio interface. The script editor contains the following code:

```
# Null Hypothesis : Gender doesn't affect using of rental bike or scooty frequently
t.test(file$RBisc~file$Gender)
# Since p-value is more than 0.05 we will accept null hypothesis
```

The console output shows the results of the Welch Two Sample t-test:

```
data: file$RBisc by file$Gender
t = 0, df = 13.781, p-value = 1
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -0.825285  0.825285
sample estimates:
mean in group 1 mean in group 2
 2.666667      2.666667
```

The right-hand pane shows the Environment tab with a table of data:

Variable	Count
file	45 obs. of 2
GePri	List of 12
Mtra	List of 13

- Do mode of transportation effect number of bikes at home?

The screenshot shows the RStudio interface. The script editor contains the following code:

```
# Null Hypothesis : Private vehicle user have not more bike at home
t.test(file$Nbike~file$MPTmethod)
# Since p-value is greater than 0.05 we will accept null hypothesis
```

The console output shows the results of the Welch Two Sample t-test:

```
data: file$Nbike by file$MPTmethod
t = 0.23399, df = 15.516, p-value = 0.818
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -0.7347895  0.9166077
sample estimates:
mean in group Private vehicle mean in group Public transport
 1.757576      1.666667
```

The right-hand pane shows the Environment tab with a table of data:

Variable	Count
file	45 obs. of 2
GePri	List of 12
Mtra	List of 13

- Do mode of transportation effect number of “4-wheeler at home? Does gender affect use of private or rental cycle frequently?

LIVE PROJECTS- Introduction to R

The screenshot shows the RStudio interface. The script editor contains the following code:

```
45 t.test(file$N4wh~file$MPTmethod)
46
45.33 (Top Level)
```

The console output shows the results of a Welch Two Sample t-test:

```
> #6. Do mode of transportation effect number of 4 wheeler at home?
> # Null Hypothesis : Mode of transportation have no effect on number of 4 wheeler at h
ome
> t.test(file$N4wh~file$MPTmethod)

Welch Two Sample t-test

data: file$N4wh by file$MPTmethod
t = 0.22879, df = 18.094, p-value = 0.8216
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -0.7435785  0.9253967
sample estimates:
mean in group Private vehicle mean in group Public transport
      1.090909              1.000000

> # Since p-value is greater than 0.05 we will accept null hypothesis
> # Hence mode of transportation have no effect on number of 4 wheeler at home
>
```

The Environment pane on the right shows the Global Environment with variables: file (45 obs. of 2...), GePri (List of 12), and Mtra (List of 13). The Files pane shows 'R: Set Operations' and 'sets (base) R Documentation'.

7. Does gender affect use of private or rental cycle frequently?

The screenshot shows the RStudio interface. The script editor contains the following code:

```
51 t.test(file$P.Rcy~file$Gender)
52 # Since p-value is greater than 0.05 we will accept null hypothesis
51.31 (Top Level)
```

The console output shows the results of a Welch Two Sample t-test:

```
> #7. Does gender affect using private or rental cycle frequently?
> # Null Hypothesis : Gender have no effect on using private or rental cycle frequen
> t.test(file$P.Rcy~file$Gender)

Welch Two Sample t-test

data: file$P.Rcy by file$Gender
t = 1.5613, df = 14.582, p-value = 0.1399
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -0.1945191  1.2500747
sample estimates:
mean in group 1 mean in group 2
      2.527778      2.000000

> # Since p-value is greater than 0.05 we will accept null hypothesis
> # Hence Gender have no effect on using private or rental cycle frequently
>
```

The Environment pane on the right shows the Global Environment with variables: file (45 obs. of 2...), GePri (List of 12), and Mtra (List of 13). The Files pane shows 'R: Set Operations' and 'sets (base) R Documentation'.

8. Does mode of transport affect type of new vehicle preferred by people?

LIVE PROJECTS- Introduction to R

The screenshot shows the R Studio interface. The script editor contains the following code:

```
# Null Hypothesis : There is no affect of mode of transport on type of new vehicle preferred by people
chisq.test(file$PinNew,file$Mtransp)
```

The console output shows the results of the Chi-squared test:

```
Pearson's Chi-squared test
data: file$PinNew and file$Mtransp
X-squared = 8.0344, df = 15, p-value = 0.9224
```

A warning message is displayed:

```
Warning message:
In chisq.test(file$PinNew, file$Mtransp) :
  Chi-squared approximation may be incorrect
```

The right-hand pane shows the 'Set Operations' documentation page.

9. Does having preference for type of new vehicle have effect on happiness of current daily transportation mode?

The screenshot shows the R Studio interface. The script editor contains the following code:

```
#9. Does having preference for type of new vehicle have effect on happiness of current daily transportation mode?
# Null Hypothesis : Preference for type of new vehicle have no effect on current daily transportation mode
maov = aov(file$DHappy~file$PinNew)
summary(maov)
```

The console output shows the results of the ANOVA test:

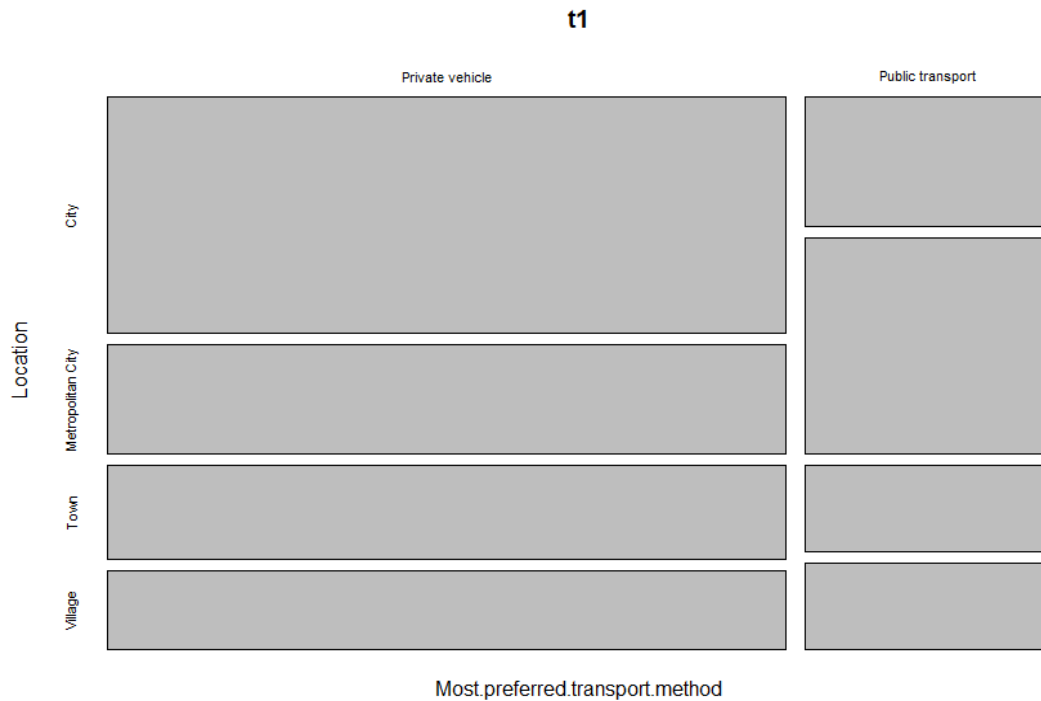
```

      Df Sum Sq Mean Sq F value Pr(>F)
file$PinNew  3    0.45   0.1484   0.17  0.916
Residuals 41  35.87   0.8748

```

The right-hand pane shows the 'Set Operations' documentation page.

10. Mosaic Plot on Location and Transportation preference.



```
> t1= table(Most.preferred.transport.method,Location)
```

```
> t1
```

```

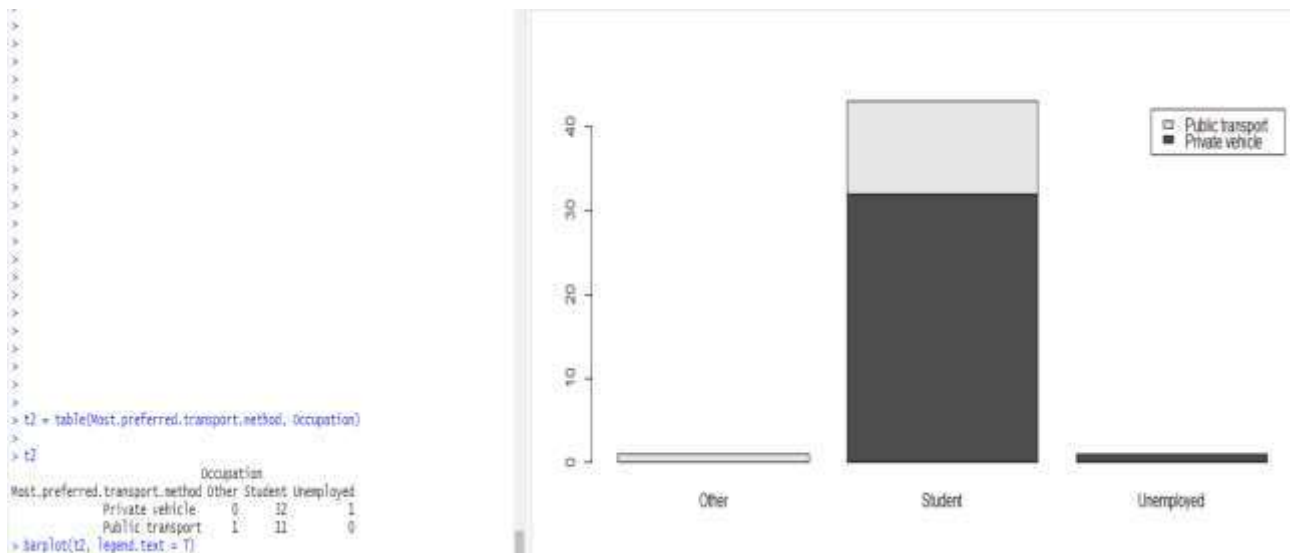
      Location
Most.preferred.transport.method City Metropolitan City Town Village
      Private vehicle      15              7      6      5
      Public transport       3              5      2      2

```

```
> mosaicplot(t1)
```

```
>
```

11. Construct a bar plot to show how people of different occupation use different transport methods.



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.



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REAL LEARNING.**

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