**Reading Dataset:**

perData <- read.csv("Viewpoints on Terrorism.csv",header = T,stringsAsFactors = F)

**Changing Column Names:**

colnames(perData) <- c("Timestamp","Gender","Age","City","Profession","Education","Spread","Emotion\_Unbalance","Places","Holiday","Counter","Combat","Equiped","Safe")

colnames(perData)

**Output:**

|  |  |  |  |
| --- | --- | --- | --- |
| "Timestamp" | "Gender" | "Age" | "City" |
| "Profession" | "Education" | "Spread" | "Emotion\_Unbalance” |
| "Places" | "Holiday" | "Counter" | "Combat" |
| "Equiped" | "Safe" |  |  |

**Changing Other Variables To Factors:**

perData$Age <- factor(perData$Age)

perData$Gender <- factor(perData$Gender)

perData$City <- factor(perData$City)

perData$Profession <- factor(perData$Profession)

perData$Education <- factor(perData$Education)

summary(perData)

**Giving Weightage To Answers:**

perData$Spread[perData$Spread=="Strongly Disagree"] <- 1

perData$Spread[perData$Spread=="Disagree"] <- 2

perData$Spread[perData$Spread=="Neutral"] <- 3

perData$Spread[perData$Spread=="Agree"] <- 4

perData$Spread[perData$Spread=="Strongly Agree"] <- 5

perData$Emotion\_Unbalance[perData$Emotion\_Unbalance=="Strongly Disagree"] <- 1

perData$Emotion\_Unbalance[perData$Emotion\_Unbalance=="Disagree"] <- 2

perData$Emotion\_Unbalance[perData$Emotion\_Unbalance=="Neutral"] <- 3

perData$Emotion\_Unbalance[perData$Emotion\_Unbalance=="Agree"] <- 4

perData$Emotion\_Unbalance[perData$Emotion\_Unbalance=="Strongly Agree"] <- 5

perData$Places[perData$Places=="Strongly Disagree"] <- 1

perData$Places[perData$Places=="Disagree"] <- 2

perData$Places[perData$Places=="Neutral"] <- 3

perData$Places[perData$Places=="Agree"] <- 4

perData$Places[perData$Places=="Strongly Agree"] <- 5

perData$Holiday[perData$Holiday=="Strongly Disagree"] <- 1

perData$Holiday[perData$Holiday=="Disagree"] <- 2

perData$Holiday[perData$Holiday=="Neutral"] <- 3

perData$Holiday[perData$Holiday=="Agree"] <- 4

perData$Holiday[perData$Holiday=="Strongly Agree"] <- 5

perData$Combat[perData$Combat=="Strongly Disagree"] <- 5

perData$Combat[perData$Combat=="Disagree"] <- 4

perData$Combat[perData$Combat=="Neutral"] <- 3

perData$Combat[perData$Combat=="Agree"] <- 2

perData$Combat[perData$Combat=="Strongly Agree"] <- 1

perData$Equiped[perData$Equiped=="Strongly Disagree"] <- 5

perData$Equiped[perData$Equiped=="Disagree"] <- 4

perData$Equiped[perData$Equiped=="Neutral"] <- 3

perData$Equiped[perData$Equiped=="Agree"] <- 2

perData$Equiped[perData$Equiped=="Strongly Agree"] <- 1

perData$Counter[perData$Counter=="Strongly Disagree"] <- 5

perData$Counter[perData$Counter=="Disagree"] <- 4

perData$Counter[perData$Counter=="Neutral"] <- 3

perData$Counter[perData$Counter=="Agree"] <- 2

perData$Counter[perData$Counter=="Strongly Agree"] <- 1

head(perData)

**Subset Data To Perform Factor Analysis :**

**Removing categorical variables:**

percep<-subset(perData,select=c(-Timestamp,-Gender,-Age,-City,-Profession,-Education))

**Converting into numeric variables:**

percep$Spread<-as.numeric(percep$Spread)

percep$Emotion\_Unbalance<-as.numeric(percep$Emotion\_Unbalance)

percep$Places<-as.numeric(percep$Places)

percep$Holiday<-as.numeric(percep$Holiday)

percep$Counter<-as.numeric(percep$Counter)

percep$Combat<-as.numeric(percep$Combat)

percep$Equiped<-as.numeric(percep$Equiped)

head(percep)

|  |
| --- |
| Spread Emotion\_Unbalance Places Holiday Counter Combat Equiped |
| 4 5 4 2 4 4 4 |
| 4 3 4 1 3 3 4 |
| 4 4 4 4 4 4 4 |
| 4 4 4 4 2 2 2 |
| 3 5 5 4 2 2 3 |
| 4 3 5 5 2 4 4 |

**Creating Factors:**

**#1**

fact <- factanal(percep,2, rotation="varimax",scores="regression")

fact

**Output:**

Call:

factanal(x = percep, factors = 2, scores = "regression", rotation = "varimax")

Uniquenesses:

Spread Emotion\_Unbalance Places Holiday Counter

0.638 0.769 0.785 0.951 0.669

Combat Equiped

0.314 0.504

Loadings:

|  |  |  |
| --- | --- | --- |
|  | Factor1 | Factor2 |
| Spread | 0.187 | 0.572 |
| Emotion\_Unbalance |  | 0.471 |
| Places | 0.128 | 0.446 |
| Holiday |  | 0.221 |
| Counter | 0.558 | 0.143 |
| Combat | 0.823 |  |
| Equiped | 0.698 |  |

Factor1 Factor2

SS loadings 1.537 0.833

Proportion Var 0.228 0.119

Cumulative Var 0.228 0.339

Test of the hypothesis that 2 factors are sufficient.

The chi square statistic is 16.4 on 8 degrees of freedom.

The p-value is 0.0369

***#Since p-value is less than 0.05 and variance explained is around 34% thus we reject Null hypothesis and run the analysis again with 3 factors.***

**#2**

fact <- factanal(percep,3, rotation="varimax",scores="regression")

fact

Call:

factanal(x = percep, factors = 3, scores = "regression", rotation = "varimax")

Uniquenesses:

Spread Emotion\_Unbalance Places Holiday Counter

0.406 0.823 0.823 0.005 0.666

Combat Equiped

0.314 0.503

Loadings:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Factor1 | Factor2 | | Factor3 |
| Spread | 0.126 |  | 0.756 | |
| Emotion\_Unbalance |  | 0.120 | 0.393 | |
| Places | 0.115 | 0.102 | | 0.392 |
| Holiday |  | 0.983 | | 0.166 |
| Counter | 0.551 |  | 0.167 | |
| Combat | 0.816 |  | 0.137 | |
| Equiped | 0.694 |  | 0.123 | |

Factor1 Factor2 Factor3

SS loadings 1.490 1.002 0.968

Proportion Var 0.213 0.143 0.138

Cumulative Var 0.213 0.356 0.494

Test of the hypothesis that 3 factors are sufficient.

The chi square statistic is 3.77 on 3 degrees of freedom.

The p-value is 0.288

***#p-value is 0.288 and variance explained is close to 50%. Also the variables are properly distributed across factors, so we accept this 3 factors and perform our tests on this factors.***

*Variables Distribution:*

|  |  |  |  |
| --- | --- | --- | --- |
| Variables | Factor1 | Factor2 | Factor3 |
| Counter | Holiday | Spread |
| Combat |  | Emotion\_Unbalance |
| Equiped |  | Places |

**Creating Fear Index and Factor Columns:**

* perData$Fear\_Index <- 100 \* (percep$Spread + percep$Emotion\_Unbalance + percep$Places + percep$Holiday +percep$Counter + percep$Combat + percep$Equiped + percep$Safe ) / 40
* perData$Government\_Efficiency <- fact$score[,1]
* perData$Fear\_on\_Holiday <- fact$score[,2]
* perData$Rumors\_Impact <- fact$score[,3]

**Normality Test on newly created Factors And Fear Index:**

shapiro.test(perData$Government\_Efficiency)

shapiro.test(perData$Fear\_on\_Holiday)

shapiro.test(perData$Rumors\_Impact)

shapiro.test(perData$Fear\_Index)

lillie.test(perData$Government\_Efficiency)

lillie.test(perData$Fear\_on\_Holiday)

lillie.test(perData$Rumors\_Impact)

lillie.test(perData$Fear\_Index)

***#since p-value for all the above test is less than 0.05 we reject null hypothesis that data is normally distributed.***

*Snapshot of the newly created Data:*

|  |  |  |  |
| --- | --- | --- | --- |
| Government\_Efficiency | Fear\_on\_Holiday | Rumors\_Impact | Fear\_Index |
| 0.61674919 | -0.7732307 | 0.1718651 | 75.0 |
| -0.07802531 | -1.6235867 | -0.2450539 | 62.5 |
| 0.55189624 | 1.0194520 | 0.1574120 | 77.5 |
| -1.54503358 | 0.9414422 | 0.2276382 | 62.5 |
| -1.16634569 | 1.0364376 | -0.2504964 | 65.0 |
| 0.17124575 | 1.9019826 | 0.1735160 | 77.5 |
| 0.17124575 | 1.9019826 | 0.1735160 | 77.5 |
| -0.07032851 | -1.6234086 | -0.2454426 | 57.5 |
| 0.65340241 | 1.1887529 | -0.8310381 | 72.5 |
| 0.01957559 | -0.8270522 | 0.3845663 | 70.0 |

**Hypothesis Testing**

***Since the data did not follow Normal Distribution we used Non parametric tests to perform hypothesis testing.***

***Hypothesis Test done on Fear Index:***

wilcox.test(formula=as.numeric(Fear\_Index)~Gender,data=perData)

#accept null hypothesis since p-value = 0.6221

kruskal.test(formula=Fear\_Index~Age,data=perData)

#accept null hypothesis since p-value = 0.6845

kruskal.test(formula=Fear\_Index~ City,data=perData)

#accept null hypothesis since p-value = 0.1633

kruskal.test(formula=Fear\_Index~Profession,data=perData)

#reject null hypothesis since p-value = **0.002801**

kruskal.test(formula=Fear\_Index~Education,data=perData)

# reject null hypothesis since p-value = **0.02446**

***Hypothesis test done on Factors:***

wilcox.test(formula=as.numeric(Government\_Efficiency)~Gender,data=perData)

#reject null hypothesis since p-value = **0.01502**

wilcox.test(formula=as.numeric(Fear\_on\_Holiday)~Gender,data=perData)

#reject null hypothesis since p-value = **0.0002909**

wilcox.test(formula=as.numeric(Rumors\_Impact)~Gender,data=perData)

#accept null hypothesis since p-value = 0.4694

kruskal.test(formula=Government\_Efficiency~Profession,data=perData)

#accept null hypothesis since p-value = 0.09147

kruskal.test(formula=Fear\_on\_Holiday~Profession,data=perData)

#accept null hypothesis since p-value = 0.627

kruskal.test(formula=Rumors\_Impact~Profession,data=perData)

#reject null hypothesis since p-value = **0.004582**

kruskal.test(formula=Government\_Efficiency~Age,data=perData)

#accept null hypothesis since p-value = 0.9218

kruskal.test(formula=Fear\_on\_Holiday~Age,data=perData)

#accept null hypothesis since p-value = 0.6944

kruskal.test(formula=Rumors\_Impact~Age,data=perData)

#accept null hypothesis since p-value = 0.3316

kruskal.test(formula=Government\_Efficiency~City,data=perData)

#accept null hypothesis since p-value = 0.1866

kruskal.test(formula=Fear\_on\_Holiday~City,data=perData)

#accept null hypothesis since p-value = 0.9032

kruskal.test(formula=Rumors\_Impact~City,data=perData)

#accept null hypothesis since p-value = 0.116

kruskal.test(formula=Government\_Efficiency~Education,data=perData)

#accept null hypothesis since p-value = 0.2917

kruskal.test(formula=Fear\_on\_Holiday~Education,data=perData)

#accept null hypothesis since p-value = 0.8074

kruskal.test(formula=Rumors\_Impact~Education,data=perData)

#reject null hypothesis since p-value = **0.001022**

**Chi-Squared Test of Independence:**

CrossTable(perData$NewSafeData,perData$Gender,chisq=TRUE)

Pearson's Chi-squared test

------------------------------------------------------------

Chi^2 = 8.03832 d.f. = 2 **p = 0.01796805**

CrossTable(perData$NewSafeData,perData$Age,chisq=TRUE)

Pearson's Chi-squared test

------------------------------------------------------------

Chi^2 = 10.39023 d.f. = 8 **p = 0.2386978**

CrossTable(perData$NewSafeData,perData$Profession,chisq=TRUE)

Pearson's Chi-squared test

------------------------------------------------------------

Chi^2 = 10.88793 d.f. = 22 **p = 0.9763109**

CrossTable(perData$NewSafeData,perData$Education,chisq=TRUE)

Pearson's Chi-squared test

------------------------------------------------------------

Chi^2 = 4.768142 d.f. = 8 **p = 0.7820456**

**Cross Tabulation Analysis:**

table(perData$NewSafeData,perData$Gender)

|  |  |  |
| --- | --- | --- |
|  | Female | Male |
| Neutral | 44 | 77 |
| Safe | 52 | 97 |
| Unsafe | 25 | 18 |

table(perData$NewSafeData,perData$Age)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 15-25 | 25-35 | 35-45 | 45-55 | 55+ |
| Neutral | 63 | 43 | 12 | 3 | 0 |
| Safe | 78 | 56 | 9 | 6 | 0 |
| Unsafe | 25 | 11 | 5 | 1 | 1 |

***#Since the last few class have fewer values we merge them into one.***

perData$NewAgeGroup <- ifelse(perData$Age=="15-25", "15-25", ifelse(perData$Age=="25-35","25-35",

ifelse(perData$Age=="35-45","35-45",ifelse(perData$Age=="45-55","45-55","45-55"))))

table(perData$NewSafeData,perData$NewAgeGroup)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 15-25 | 25-35 | 35-45 | 45-55 |
| Neutral | 63 | 43 | 12 | 3 |
| Safe | 78 | 56 | 9 | 6 |
| Unsafe | 25 | 11 | 5 | 2 |

table(perData$NewSafeData,perData$Education)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Graduate | Masters | PhD | Post Graduate | UnderGraduate |
| Neutral | 41 | 14 | 0 | 45 | 21 |
| Safe | 48 | 26 | 1 | 52 | 22 |
| Unsafe | 18 | 7 | 0 | 12 | 6 |

***#we merge Masters,PhD,Post Graduate into one class.***

perData$NewEducation <- ifelse(perData$Education=="Graduate", "Graduate", ifelse((perData$Education=="Masters") |

(perData$Education=="PhD") | (perData$Education=="Post Graduate"),"Post Graduate",

"UnderGraduate"))

table(perData$NewSafeData,perData$NewEducation)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Graduate | Post Graduate | UnderGraduate |
| Neutral | 41 | 59 | 21 |
| Safe | 48 | 79 | 22 |
| Unsafe | 18 | 19 | 6 |

table(perData$NewSafeData,perData$Profession)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | Consultant | Employee at an organisation | | | | exports | | Homemaker | |
| Neutral | | 0 | 66 | | | | 1 | | 1 | |
| Safe | | 1 | 83 | | | | 0 | | 2 | |
| Unsafe | | 0 | 27 | | | | 0 | | 0 | |
|  | | | | | | | | | | |
|  | Private service | | | | Self Employed | Student | | Teacher | | Other |
| Neutral | 1 | | | | 11 | 30 | | 1 | | 0 |
| Safe | 0 | | | | 14 | 41 | | 1 | | 1 |
| Unsafe | 0 | | | | 3 | 10 | | 0 | | 0 |
|  | | | | | | | | | | |
|  | Unemployed | | | Working in a government organisation | | | | | | |
| Neutral | 7 | | | 3 | | | | | | |
| Safe | 5 | | | 1 | | | | | | |
| Unsafe | 2 | | | 1 | | | | | | |