R_File_Young_Survey

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.

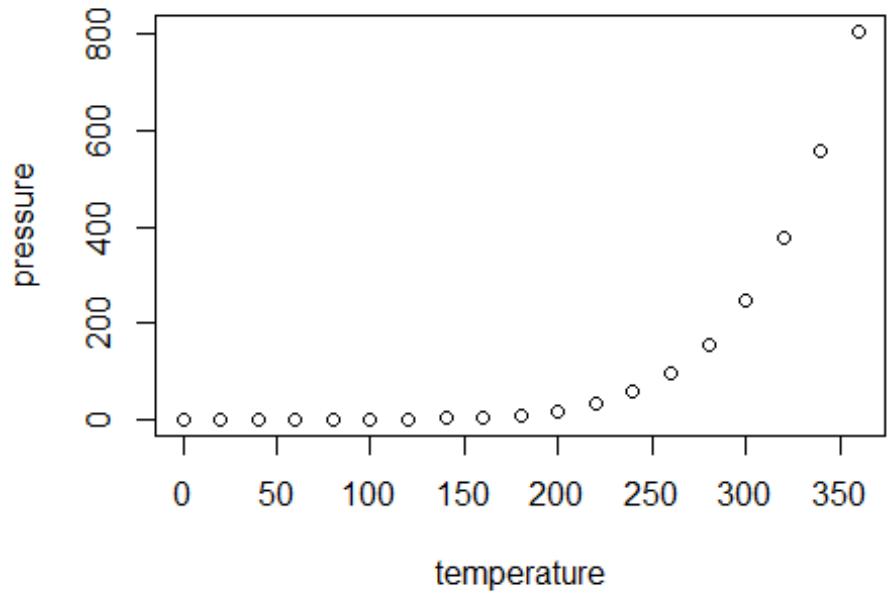
When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
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.

```
data <- read.csv("G:/Rutgers/MVA/Project/responses.csv")
View(data)

# The structure of the datasets
dim(data)

## [1] 1010  150

## Separate out numeric variables and categoric variables
data_cat <- data[,sapply(data, is.factor)]
data_num <- data[,!sapply(data, is.factor)]
dim(data_cat) # 11 features

## [1] 1010   11

dim(data_num) # 139 features

## [1] 1010  139

# Grouping of columns accoring to the preferences
music_data = data[,1:19]
movie_data = data[,20:31]
hobbies_data = data[,32:63]
phobia_data =  data[,64:73]
health_data = data[,74:76]
```

```
traits_data = data[,77:133]
spend_data = data[,134:140]
demo_data = data[,141:150]
```

MISSING VALUES ANALYSIS

```
sum(is.na(data))
```

```
## [1] 571
```

```
colSums(is.na(data)) #suming the na values as per the column level
```

```
##                          Music       Slow.songs.or.fast.songs
##                              3                              2
##                          Dance                           Folk
##                              4                              5
##                        Country                Classical.music
##                              5                              7
##                        Musical                            Pop
##                              2                              3
##                           Rock              Metal.or.Hardrock
##                              6                              3
##                           Punk                    Hiphop..Rap
##                              8                              4
##                     Reggae..Ska                    Swing..Jazz
##                              7                              6
##                     Rock.n.roll                    Alternative
##                              7                              7
##                         Latino                 Techno..Trance
##                              8                              7
##                          Opera                         Movies
##                              1                              6
##                         Horror                       Thriller
##                              2                              1
##                         Comedy                       Romantic
##                              3                              3
##                         Sci.fi                            War
##                              2                              2
##             Fantasy.Fairy.tales                       Animated
##                              3                              3
##                     Documentary                        Western
##                              8                              4
##                          Action                        History
##                              2                              2
##                      Psychology                       Politics
##                              5                              1
##                     Mathematics                        Physics
##                              3                              3
##                        Internet                             PC
##                              4                              6
##               Economy.Management                        Biology
```

```
##                           5                           6
##                   Chemistry                     Reading
##                          10                           6
##                   Geography             Foreign.languages
##                           9                           5
##                    Medicine                         Law
##                           5                           1
##                        Cars               Art.exhibitions
##                           4                           6
##                    Religion         Countryside..outdoors
##                           3                           7
##                     Dancing           Musical.instruments
##                           3                           1
##                     Writing                Passive.sport
##                           6                          15
##                Active.sport                    Gardening
##                           4                           7
##                 Celebrities                    Shopping
##                           2                           2
##       Science.and.technology                     Theatre
##                           6                           8
##             Fun.with.friends           Adrenaline.sports
##                           4                           3
##                        Pets                      Flying
##                           4                           3
##                       Storm                    Darkness
##                           1                           2
##                     Heights                     Spiders
##                           3                           5
##                      Snakes                        Rats
##                           0                           3
##                      Ageing               Dangerous.dogs
##                           1                           1
##      Fear.of.public.speaking                     Smoking
##                           1                           0
##                     Alcohol               Healthy.eating
##                           0                           3
##                Daily.events         Prioritising.workload
##                           7                           5
##               Writing.notes                  Workaholism
##                           3                           5
##               Thinking.ahead               Final.judgement
##                           3                           7
##                 Reliability             Keeping.promises
##                           4                           1
##             Loss.of.interest          Friends.versus.money
##                           4                           6
##                   Funniness                        Fake
##                           4                           1
##               Criminal.damage               Decision.making
```

```
##                             7                             4
##                    Elections                Self.criticism
##                             3                             5
##               Judgment.calls                  Hypochondria
##                             4                             4
##                      Empathy             Eating.to.survive
##                             5                             0
##                       Giving          Compassion.to.animals
##                             6                             7
##               Borrowed.stuff                     Loneliness
##                             2                             1
##           Cheating.in.school                         Health
##                             4                             1
##            Changing.the.past                            God
##                             2                             2
##                      Dreams                         Charity
##                             0                             3
##            Number.of.friends                    Punctuality
##                             0                             0
##                         Lying                        Waiting
##                             0                             3
##              New.environment                    Mood.swings
##                             2                             4
##       Appearence.and.gestures                    Socializing
##                             3                             5
##                Achievements Responding.to.a.serious.letter
##                             2                             6
##                    Children                  Assertiveness
##                             4                             2
##                Getting.angry       Knowing.the.right.people
##                             4                             2
##               Public.speaking                  Unpopularity
##                             2                             3
##                Life.struggles             Happiness.in.life
##                             3                             4
##                Energy.levels               Small...big.dogs
##                             5                             4
##                   Personality         Finding.lost.valuables
##                             4                             4
##                    Getting.up           Interests.or.hobbies
##                             5                             3
##               Parents..advice        Questionnaires.or.polls
##                             2                             4
##                Internet.usage                       Finances
##                             0                             3
##              Shopping.centres               Branded.clothing
##                             2                             2
##        Entertainment.spending             Spending.on.looks
##                             3                             3
##            Spending.on.gadgets     Spending.on.healthy.eating
```

```
##                              0                              2
##                            Age                         Height
##                              7                             20
##                         Weight             Number.of.siblings
##                             20                              6
##                         Gender            Left...right.handed
##                              0                              0
##                      Education                    Only.child
##                              0                              0
##                  Village...town         House...block.of.flats
##                              0                              0
```

```
# Finding missing values with more than 1%
# Create a function
pMiss <- function(x){sum(is.na(x))/length(x)*100}

perc_cat <- apply(data_cat, 2, pMiss)
perc_num <- apply(data_num, 2, pMiss)
perc_cat # this shows the percentage of missing value in the categorial data
sat
```

```
##                 Smoking                 Alcohol             Punctuality
##                       0                       0                       0
##                   Lying          Internet.usage                  Gender
##                       0                       0                       0
##    Left...right.handed               Education             Only.child
##                       0                       0                       0
##         Village...town House...block.of.flats
##                       0                       0
```

```
# this shows the percentage of missing value in the numerical data
perc_num
```

```
##                           Music       Slow.songs.or.fast.songs
##                       0.2970297                       0.1980198
##                           Dance                            Folk
##                       0.3960396                       0.4950495
##                         Country                 Classical.music
##                       0.4950495                       0.6930693
##                         Musical                             Pop
##                       0.1980198                       0.2970297
##                            Rock               Metal.or.Hardrock
##                       0.5940594                       0.2970297
##                            Punk                     Hiphop..Rap
##                       0.7920792                       0.3960396
##                      Reggae..Ska                     Swing..Jazz
##                       0.6930693                       0.5940594
##                     Rock.n.roll                     Alternative
##                       0.6930693                       0.6930693
##                          Latino                  Techno..Trance
##                       0.7920792                       0.6930693
```

```
##                         Opera                        Movies
##                     0.0990099                     0.5940594
##                        Horror                      Thriller
##                     0.1980198                     0.0990099
##                        Comedy                      Romantic
##                     0.2970297                     0.2970297
##                        Sci.fi                           War
##                     0.1980198                     0.1980198
##           Fantasy.Fairy.tales                      Animated
##                     0.2970297                     0.2970297
##                   Documentary                       Western
##                     0.7920792                     0.3960396
##                        Action                       History
##                     0.1980198                     0.1980198
##                    Psychology                      Politics
##                     0.4950495                     0.0990099
##                   Mathematics                       Physics
##                     0.2970297                     0.2970297
##                      Internet                            PC
##                     0.3960396                     0.5940594
##           Economy.Management                       Biology
##                     0.4950495                     0.5940594
##                     Chemistry                       Reading
##                     0.9900990                     0.5940594
##                     Geography             Foreign.languages
##                     0.8910891                     0.4950495
##                      Medicine                           Law
##                     0.4950495                     0.0990099
##                          Cars                Art.exhibitions
##                     0.3960396                     0.5940594
##                      Religion          Countryside..outdoors
##                     0.2970297                     0.6930693
##                       Dancing            Musical.instruments
##                     0.2970297                     0.0990099
##                       Writing                  Passive.sport
##                     0.5940594                     1.4851485
##                  Active.sport                      Gardening
##                     0.3960396                     0.6930693
##                   Celebrities                       Shopping
##                     0.1980198                     0.1980198
##         Science.and.technology                        Theatre
##                     0.5940594                     0.7920792
##               Fun.with.friends             Adrenaline.sports
##                     0.3960396                     0.2970297
##                          Pets                        Flying
##                     0.3960396                     0.2970297
##                         Storm                      Darkness
##                     0.0990099                     0.1980198
##                       Heights                       Spiders
##                     0.2970297                     0.4950495
```

```
##                         Snakes                          Rats
##                      0.0000000                     0.2970297
##                         Ageing                Dangerous.dogs
##                      0.0990099                     0.0990099
##         Fear.of.public.speaking                Healthy.eating
##                      0.0990099                     0.2970297
##                   Daily.events          Prioritising.workload
##                      0.6930693                     0.4950495
##                  Writing.notes                    Workaholism
##                      0.2970297                     0.4950495
##                 Thinking.ahead                Final.judgement
##                      0.2970297                     0.6930693
##                    Reliability               Keeping.promises
##                      0.3960396                     0.0990099
##               Loss.of.interest           Friends.versus.money
##                      0.3960396                     0.5940594
##                      Funniness                          Fake
##                      0.3960396                     0.0990099
##                Criminal.damage                Decision.making
##                      0.6930693                     0.3960396
##                      Elections                 Self.criticism
##                      0.2970297                     0.4950495
##                 Judgment.calls                   Hypochondria
##                      0.3960396                     0.3960396
##                        Empathy              Eating.to.survive
##                      0.4950495                     0.0000000
##                           Giving          Compassion.to.animals
##                      0.5940594                     0.6930693
##                 Borrowed.stuff                     Loneliness
##                      0.1980198                     0.0990099
##              Cheating.in.school                         Health
##                      0.3960396                     0.0990099
##             Changing.the.past                             God
##                      0.1980198                     0.1980198
##                         Dreams                       Charity
##                      0.0000000                     0.2970297
##              Number.of.friends                       Waiting
##                      0.0000000                     0.2970297
##                New.environment                    Mood.swings
##                      0.1980198                     0.3960396
##         Appearence.and.gestures                    Socializing
##                      0.2970297                     0.4950495
##                   Achievements Responding.to.a.serious.letter
##                      0.1980198                     0.5940594
##                       Children                   Assertiveness
##                      0.3960396                     0.1980198
##                  Getting.angry       Knowing.the.right.people
##                      0.3960396                     0.1980198
##                Public.speaking                   Unpopularity
##                      0.1980198                     0.2970297
```

```
##                  Life.struggles              Happiness.in.life
##                       0.2970297                      0.3960396
##                   Energy.levels               Small...big.dogs
##                       0.4950495                      0.3960396
##                     Personality         Finding.lost.valuables
##                       0.3960396                      0.3960396
##                     Getting.up           Interests.or.hobbies
##                       0.4950495                      0.2970297
##                  Parents..advice        Questionnaires.or.polls
##                       0.1980198                      0.3960396
##                        Finances               Shopping.centres
##                       0.2970297                      0.1980198
##                Branded.clothing         Entertainment.spending
##                       0.1980198                      0.2970297
##               Spending.on.looks            Spending.on.gadgets
##                       0.2970297                      0.0000000
##     Spending.on.healthy.eating                            Age
##                       0.1980198                      0.6930693
##                          Height                         Weight
##                       1.9801980                      1.9801980
##              Number.of.siblings
##                       0.5940594
```

IMPUTE MISSING VALUES : Imputation based on predictive method using features

```
# Numeric variable imputation
library(mice)

## Warning: package 'mice' was built under R version 3.6.2

## Loading required package: lattice

## Warning: package 'lattice' was built under R version 3.6.2

##
## Attaching package: 'mice'

## The following objects are masked from 'package:base':
##
##     cbind, rbind

# methods(mice)

impu_num = mice(data_num, m=1, method = 'pmm', maxit = 1, seed = 200)

##
##  iter imp variable
##   1   1  Music  Slow.songs.or.fast.songs  Dance  Folk  Country
Classical.music  Musical  Pop  Rock  Metal.or.Hardrock  Punk  Hiphop..Rap
Reggae..Ska  Swing..Jazz  Rock.n.roll  Alternative  Latino  Techno..Trance
Opera  Movies  Horror  Thriller  Comedy  Romantic  Sci.fi  War
Fantasy.Fairy.tales  Animated  Documentary  Western  Action  History
```

```
Psychology Politics Mathematics Physics Internet PC Economy.Management
Biology Chemistry Reading Geography Foreign.languages Medicine Law
Cars Art.exhibitions Religion Countryside..outdoors Dancing
Musical.instruments Writing Passive.sport Active.sport Gardening
Celebrities Shopping Science.and.technology Theatre Fun.with.friends
Adrenaline.sports Pets Flying Storm Darkness Heights Spiders Rats
Ageing Dangerous.dogs Fear.of.public.speaking Healthy.eating Daily.events
Prioritising.workload Writing.notes Workaholism Thinking.ahead
Final.judgement Reliability Keeping.promises Loss.of.interest
Friends.versus.money Funniness Fake Criminal.damage Decision.making
Elections Self.criticism Judgment.calls Hypochondria Empathy Giving
Compassion.to.animals Borrowed.stuff Loneliness Cheating.in.school Health
Changing.the.past God Charity Waiting New.environment Mood.swings
Appearence.and.gestures Socializing Achievements
Responding.to.a.serious.letter Children Assertiveness Getting.angry
Knowing.the.right.people Public.speaking Unpopularity Life.struggles
Happiness.in.life Energy.levels Small...big.dogs Personality
Finding.lost.valuables Getting.up Interests.or.hobbies Parents..advice
Questionnaires.or.polls Finances Shopping.centres Branded.clothing
Entertainment.spending Spending.on.looks Spending.on.healthy.eating Age
Height Weight Number.of.siblings
```

```
# summary(impu_num)
impu_num$imp$Age # Imputed data at each iterations
```

```
##      1
## 138 20
## 143 22
## 463 19
## 550 22
## 736 25
## 903 18
## 961 20
```

```
impu_num$imp$Weight
```

```
##      1
## 138 74
## 143 55
## 165 92
## 210 89
## 277 65
## 406 63
## 454 64
## 496 51
## 510 57
## 552 70
## 559 58
## 647 68
## 704 76
## 713 64
```

```
## 791 57
## 843 50
## 876 88
## 890 60
## 903 58
## 961 60
```

Parameters: ‘pmm’ - predictive mean matching method m=5 - no.of multiple imputed datasets maxit = 10 - no.of iterations The computational time is dependent on the ‘maxit’ - for me it took more than 20 min

```
# Get the numeirc imputed data
impu_num_compl = complete(impu_num,action = 1)
```

Imputing categorical missing variables

```
impu_cat = mice(data_cat, m=5, maxit = 10, seed = 200, method = 'pmm')
```

```
##
##  iter imp variable
##   1   1
##   1   2
##   1   3
##   1   4
##   1   5
##   2   1
##   2   2
##   2   3
##   2   4
##   2   5
##   3   1
##   3   2
##   3   3
##   3   4
##   3   5
##   4   1
##   4   2
##   4   3
##   4   4
##   4   5
##   5   1
##   5   2
##   5   3
##   5   4
##   5   5
##   6   1
##   6   2
##   6   3
##   6   4
##   6   5
##   7   1
```

```
##   7   2
##   7   3
##   7   4
##   7   5
##   8   1
##   8   2
##   8   3
##   8   4
##   8   5
##   9   1
##   9   2
##   9   3
##   9   4
##   9   5
##   10   1
##   10   2
##   10   3
##   10   4
##   10   5
```

```
# Get categoric imputed data
impu_cat_compl = complete(impu_cat, 1)

sum(is.na(impu_num_compl)) # No missing values
```

```
## [1] 0
```

```
sum(is.na(impu_cat_compl)) # No missing values
```

```
## [1] 0
```

Outlier detection:

```
library(outliers)

outlier(data_num)
```

```
##                          Music       Slow.songs.or.fast.songs
##                              1                              1
##                          Dance                           Folk
##                              1                              5
##                        Country              Classical.music
##                              5                              5
##                        Musical                            Pop
##                              5                              1
##                           Rock            Metal.or.Hardrock
##                              1                              5
##                           Punk                  Hiphop..Rap
##                              5                              5
##                    Reggae..Ska                  Swing..Jazz
##                              5                              5
##                    Rock.n.roll                  Alternative
```

```
##                             1                             5
##                        Latino                Techno..Trance
##                             5                             5
##                         Opera                        Movies
##                             5                             1
##                        Horror                      Thriller
##                             5                             1
##                        Comedy                      Romantic
##                             1                             1
##                        Sci.fi                           War
##                             1                             1
##            Fantasy.Fairy.tales                      Animated
##                             1                             1
##                   Documentary                       Western
##                             1                             5
##                        Action                       History
##                             1                             1
##                    Psychology                      Politics
##                             1                             5
##                   Mathematics                       Physics
##                             5                             5
##                      Internet                            PC
##                             1                             1
##             Economy.Management                       Biology
##                             5                             5
##                     Chemistry                       Reading
##                             5                             1
##                     Geography             Foreign.languages
##                             1                             1
##                      Medicine                           Law
##                             5                             5
##                          Cars                Art.exhibitions
##                             5                             5
##                      Religion          Countryside..outdoors
##                             5                             1
##                       Dancing            Musical.instruments
##                             5                             5
##                       Writing                 Passive.sport
##                             5                             1
##                  Active.sport                      Gardening
##                             1                             5
##                   Celebrities                       Shopping
##                             5                             1
##         Science.and.technology                        Theatre
##                             1                             1
##               Fun.with.friends              Adrenaline.sports
##                             2                             5
##                          Pets                         Flying
##                             1                             5
##                         Storm                       Darkness
```

```
##                             5                             5
##                       Heights                       Spiders
##                             5                             5
##                        Snakes                          Rats
##                             1                             5
##                       Ageing                 Dangerous.dogs
##                             5                             1
##       Fear.of.public.speaking               Healthy.eating
##                             5                             1
##                  Daily.events          Prioritising.workload
##                             1                             5
##                 Writing.notes                    Workaholism
##                             1                             5
##                Thinking.ahead                Final.judgement
##                             1                             5
##                   Reliability               Keeping.promises
##                             1                             1
##               Loss.of.interest           Friends.versus.money
##                             5                             1
##                     Funniness                          Fake
##                             1                             5
##                Criminal.damage               Decision.making
##                             5                             1
##                     Elections                Self.criticism
##                             1                             1
##                Judgment.calls                   Hypochondria
##                             1                             5
##                       Empathy               Eating.to.survive
##                             1                             5
##                        Giving          Compassion.to.animals
##                             5                             1
##                Borrowed.stuff                     Loneliness
##                             1                             5
##             Cheating.in.school                         Health
##                             1                             1
##              Changing.the.past                            God
##                             5                             1
##                       Dreams                        Charity
##                             1                             5
##              Number.of.friends                        Waiting
##                             1                             5
##                New.environment                    Mood.swings
##                             1                             1
##       Appearence.and.gestures                    Socializing
##                             1                             1
##                  Achievements Responding.to.a.serious.letter
##                             5                             1
##                      Children                  Assertiveness
##                             1                             1
##                   Getting.angry       Knowing.the.right.people
```

```
##                                1                                1
##                Public.speaking                      Unpopularity
##                                1                                1
##                 Life.struggles                Happiness.in.life
##                                1                                1
##                  Energy.levels                 Small...big.dogs
##                                1                                5
##                    Personality           Finding.lost.valuables
##                                1                                5
##                     Getting.up             Interests.or.hobbies
##                                1                                1
##                Parents..advice          Questionnaires.or.polls
##                                1                                5
##                        Finances                  Shopping.centres
##                                1                                1
##               Branded.clothing           Entertainment.spending
##                                1                                1
##              Spending.on.looks              Spending.on.gadgets
##                                1                                5
##     Spending.on.healthy.eating                              Age
##                                1                               30
##                           Height                           Weight
##                               62                              165
##             Number.of.siblings
##                               10
```

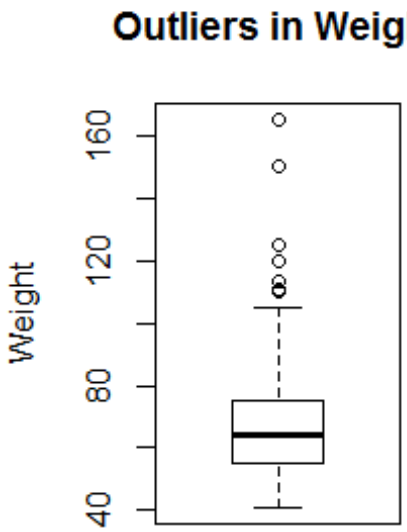
Demographic category - Height, Weight, Age, No.of siblings have maximum no.of outliers

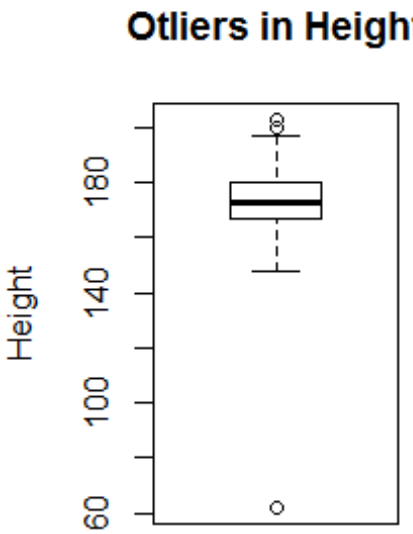
```
library(ggplot2)
```

The boxplot.stats function; is a ancillary function that produces statistics for drawing boxplots. It returns among other information a vector stats with five elements: the extreme of the lower whisker, the lower 'hinge', the median, the upper 'hinge' and the extreme of the upper whisker, the extreme of the whiskers are the adjacent values (last non-missing value, i.e. every value beyond is an outlier.

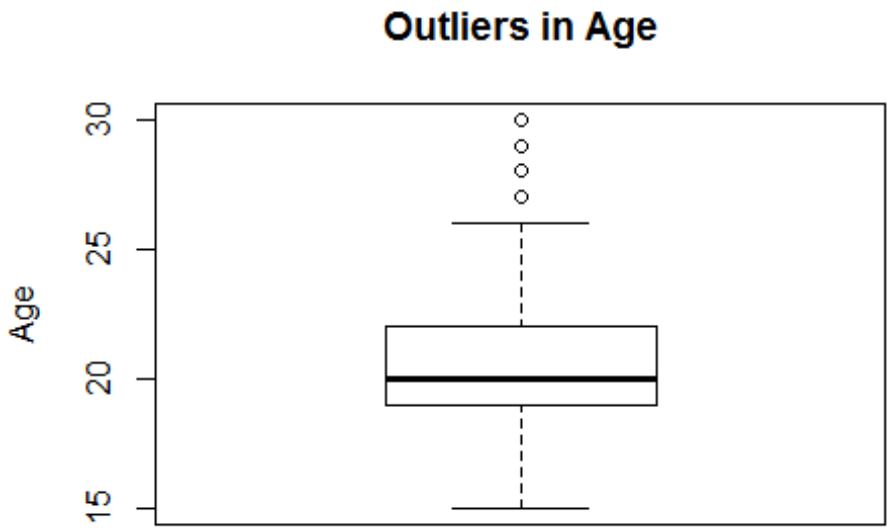
```
id1 = boxplot.stats(impu_num_compl$Weight)

id1$stats

## [1]  41  55  64  75 105

id1$stats[1] #The lower adjacent value

## [1] 41

id1$stats[5] # The upper adjacent value

## [1] 105
```

```r
id2 = boxplot.stats(impu_num_compl$Height)

id2$stats[1] #The lower adjacent value

## [1] 148

id2$stats[5] # The upper adjacent value

## [1] 197

id3 = boxplot.stats(impu_num_compl$Age)

id3$stats[1] #The lower adjacent value

## [1] 15

id3$stats[5] # The upper adjacent value

## [1] 26

id4 = boxplot.stats(impu_num_compl$Number.of.siblings)

id4$stats[1] #The lower adjacent value

## [1] 0

id4$stats[5] # The upper adjacent value

## [1] 3

# Boxplot
par(mfrow=c(1,2))
boxplot(impu_num_compl$Weight, main = 'Outliers in Weight', ylab = 'Weight')
boxplot(impu_num_compl$Height, main = 'Otliers in Height', ylab = 'Height')
```

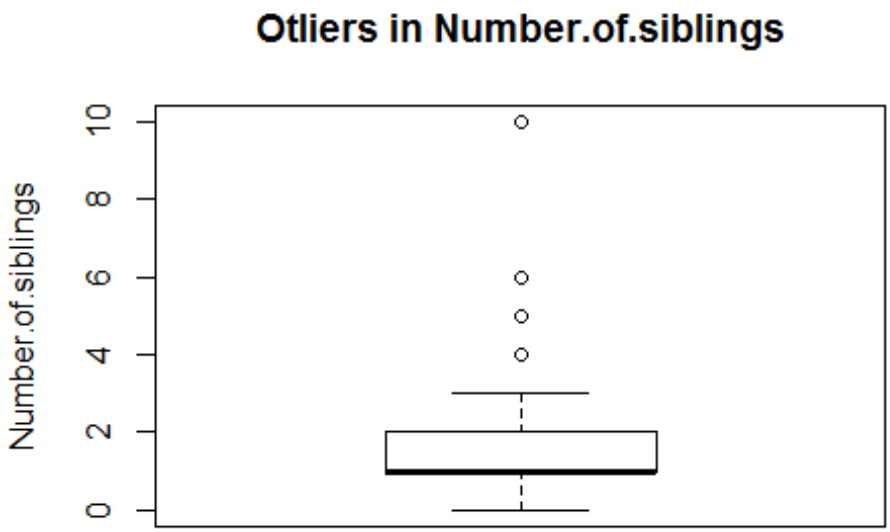





```r
boxplot(impu_num_compl$Age, main = 'Outliers in Age', ylab = 'Age')
```



```r
boxplot(impu_num_compl$Number.of.siblings , main = 'Otliers in
Number.of.siblings', ylab  ='Number.of.siblings')
```




```r
# You can get the actual values of the outliers with this

boxplot(impu_num_compl$Weight, plot=FALSE)$out

## [1] 120 110 111 120 113 125 165 120 150

boxplot(impu_num_compl$Height, plot=FALSE)$out

## [1] 200 200 203  62 203 200

# no of rows having outliers
Outlier_height = boxplot(impu_num_compl$Height, plot=FALSE)$out
impu_num_compl[which(impu_num_compl$Height %in% Outlier_height),]

##     Music Slow.songs.or.fast.songs Dance Folk Country Classical.music
Musical
## 98      5                       3     2    1       1               1
1
## 221     5                       3     4    3       3               4
2
## 548     5                       4     1    4       2               5
3
## 677     5                       4     2    2       1               2
2
## 800     5                       3     1    2       3               4
```

```
5
## 993     4                       4     4    1       4              4
1
##     Pop Rock Metal.or.Hardrock Punk Hiphop..Rap Reggae..Ska Swing..Jazz
## 98    2    1                 1    1           5           2           2
## 221   1    3                 1    2           5           4           4
## 548   1    4                 5    2           2           2           1
## 677   1    2                 2    1           2           1           2
## 800   2    4                 5    4           1           1           2
## 993   3    4                 4    3           2           3           2
##     Rock.n.roll Alternative Latino Techno..Trance Opera Movies Horror
Thriller
## 98            1           1      1              2     1      5      2
3
## 221           2           5      3              1     3      5      3
3
## 548           4           3      1              1     5      5      3
5
## 677           1           5      2              2     2      5      1
2
## 800           4           4      2              2     4      5      1
1
## 993           1           1      2              5     2      4      4
4
##     Comedy Romantic Sci.fi War Fantasy.Fairy.tales Animated Documentary
Western
## 98       5        3      5   5                   3        5           5
3
## 221      5        3      2   3                   4        5           4
3
## 548      5        2      2   4                   4        4           5
3
## 677      2        3      1   2                   3        4           5
1
## 800      4        3      4   4                   3        4           5
3
## 993      4        3      5   3                   4        4           4
3
##     Action History Psychology Politics Mathematics Physics Internet PC
## 98       5       3          2        2           4       1        5  5
## 221      4       3          3        1           1       1        3  4
## 548      4       5          3        5           1       1        3  3
## 677      3       3          1        1           1       1        5  1
## 800      3       4          2        3           4       3        5  5
## 993      4       5          2        3           5       5        4  3
##     Economy.Management Biology Chemistry Reading Geography
Foreign.languages
## 98                   2       1         1       3         1
4
## 221                  1       5         5       3         1
```

```
5
## 548                 1       2         1       5         5
5
## 677                 1       1         1       1         3
4
## 800                 2       3         2       5         3
4
## 993                 1       4         4       2         4
2
##     Medicine Law Cars Art.exhibitions Religion Countryside..outdoors
Dancing
## 98         1   2    2              1        4                     4
1
## 221        3   2    4              3        2                     4
2
## 548        2   2    1              4        4                     3
1
## 677        1   5    2              3        1                     4
1
## 800        3   2    3              4        2                     4
2
## 993        1   1    2              1        1                     1
1
##     Musical.instruments Writing Passive.sport Active.sport Gardening
## 98                    1       1             1            5         2
## 221                   5       1             5            5         3
## 548                   5       4             5            5         2
## 677                   1       1             5            5         2
## 800                   3       3             3            2         4
## 993                   1       5             4            1         1
##     Celebrities Shopping Science.and.technology Theatre Fun.with.friends
## 98            1        1                      4       1                3
## 221           1        3                      4       2                5
## 548           1        1                      2       5                5
## 677           4        3                      3       5                5
## 800           3        3                      4       5                4
## 993           1        1                      5       2                5
##     Adrenaline.sports Pets Flying Storm Darkness Heights Spiders Snakes
Rats
## 98                  3    5      1     1        2       3       2      4
1
## 221                 3    5      1     3        2       2       2      3
2
## 548                 5    4      1     1        2       3       1      1
1
## 677                 2    3      1     2        2       2       3      3
4
## 800                 3    5      2     1        3       2       3      3
2
## 993                 1    1      3     1        1       5       5      3
```

```
2
##     Ageing Dangerous.dogs Fear.of.public.speaking Healthy.eating
Daily.events
## 98       1              1                       2              3
1
## 221      1              4                       3              4
2
## 548      1              4                       1              2
5
## 677      3              3                       3              4
2
## 800      2              2                       4              3
3
## 993      2              3                       4              1
3
##     Prioritising.workload Writing.notes Workaholism Thinking.ahead
## 98                      1             1           3               2
## 221                     2             2           1               2
## 548                     2             1           2               2
## 677                     1             2           1               2
## 800                     3             2           4               3
## 993                     1             1           1               3
##     Final.judgement Reliability Keeping.promises Loss.of.interest
## 98                1           4                5                5
## 221               2           3                5                2
## 548               1           4                4                1
## 677               3           3                3                4
## 800               1           4                4                2
## 993               3           3                5                1
##     Friends.versus.money Funniness Fake Criminal.damage Decision.making
## 98                     3         4    4               5               1
## 221                    4         4    2               5               4
## 548                    5         5    1               1               3
## 677                    4         2    2               5               2
## 800                    4         3    3               2               3
## 993                    1         2    1               1               3
##     Elections Self.criticism Judgment.calls Hypochondria Empathy
## 98          5              4              3            1       4
## 221         4              2              4            1       4
## 548         5              5              5            1       4
## 677         1              2              4            2       4
## 800         2              4              4            2       4
## 993         5              2              3            1       4
##     Eating.to.survive Giving Compassion.to.animals Borrowed.stuff
Loneliness
## 98                  4      1                     2              5
5
## 221                 2      3                     5              5
2
## 548                 1      1                     5              5
```

```
1
## 677                 1      2                    1             2
2
## 800                 2      3                    5             4
4
## 993                 1      4                    2             4
3
##     Cheating.in.school Health Changing.the.past God Dreams Charity
## 98                   5      1                 5   5      4       2
## 221                  5      3                 1   2      3       1
## 548                  5      2                 2   1      3       2
## 677                  5      3                 4   4      3       2
## 800                  3      3                 2   2      4       3
## 993                  1      3                 4   5      3       3
##     Number.of.friends Waiting New.environment Mood.swings
## 98                  2       4               5           5
## 221                 4       2               4           3
## 548                 3       5               5           1
## 677                 3       3               3           5
## 800                 2       4               2           2
## 993                 3       2               2           4
##     Appearence.and.gestures Socializing Achievements
## 98                        2           3            4
## 221                       3           4            3
## 548                       1           4            2
## 677                       3           3            3
## 800                       3           2            3
## 993                       2           1            3
##     Responding.to.a.serious.letter Children Assertiveness Getting.angry
## 98                               3        5             5             2
## 221                              4        3             3             2
## 548                              3        4             2             1
## 677                              4        4             1             2
## 800                              4        3             3             2
## 993                              3        3             5             3
##     Knowing.the.right.people Public.speaking Unpopularity Life.struggles
## 98                         4               2            3               1
## 221                        4               5            3               1
## 548                        3               1            3               1
## 677                        4               2            3               3
## 800                        4               4            3               4
## 993                        3               5            3               1
##     Happiness.in.life Energy.levels Small...big.dogs Personality
## 98                  3             3                3           3
## 221                 5             4                3           4
## 548                 4             4                3           3
## 677                 3             2                2           4
## 800                 3             2                2           3
## 993                 2             3                4           3
##     Finding.lost.valuables Getting.up Interests.or.hobbies Parents..advice
```

```
## 98                        1          1                    5              3
## 221                       3          4                    5              4
## 548                       4          4                    5              4
## 677                       4          2                    3              3
## 800                       4          2                    2              3
## 993                       1          5                    3              3
##     Questionnaires.or.polls Finances Shopping.centres Branded.clothing
## 98                        1        2                1                1
## 221                       3        2                3                2
## 548                       3        3                2                1
## 677                       1        3                4                2
## 800                       3        4                3                3
## 993                       2        1                1                1
##     Entertainment.spending Spending.on.looks Spending.on.gadgets
## 98                       5                 1                   5
## 221                      5                 4                   2
## 548                      3                 1                   1
## 677                      2                 4                   2
## 800                      2                 3                   4
## 993                      5                 1                   1
##     Spending.on.healthy.eating Age Height Weight Number.of.siblings
## 98                           2  19    200     75                 1
## 221                          3  18    200     90                 2
## 548                          4  21    203     80                 2
## 677                          4  20     62     55                 2
## 800                          4  18    203     89                 2
## 993                          4  30    200    150                 1
```

```
outlier_siblings = boxplot(impu_num_compl$Number.of.siblings, plot=FALSE)$out
impu_num_compl[which(impu_num_compl$Number.of.siblings %in%
outlier_siblings),]
```

```
##      Music Slow.songs.or.fast.songs Dance Folk Country Classical.music
Musical
## 13       5                       3     1    2       1               4
3
## 33       5                       5     3    1       3               2
3
## 35       5                       4     3    2       1               3
4
## 54       5                       3     4    4       3               4
5
## 92       5                       5     1    5       1               2
5
## 125      4                       4     1    4       5               5
5
## 139      5                       3     2    3       3               4
5
## 150      2                       3     1    3       1               3
4
```

```
## 230      4                          3     4     2        4                 1
1
## 260      2                          3     3     3        3                 2
2
## 366      5                          3     2     2        3                 4
2
## 372      5                          3     5     5        5                 5
5
## 443      5                          3     4     2        4                 3
3
## 476      5                          3     3     2        5                 4
5
## 503      5                          4     4     3        2                 4
2
## 525      5                          3     2     1        2                 4
2
## 571      5                          3     3     1        1                 2
1
## 620      5                          1     3     3        1                 5
4
## 683      4                          4     4     2        3                 3
3
## 695      5                          3     3     3        4                 5
2
## 743      5                          3     1     3        4                 5
3
## 751      5                          3     5     5        2                 5
3
## 804      5                          5     2     1        1                 2
4
## 847      5                          3     5     2        2                 3
3
## 849      5                          2     2     1        1                 3
1
## 854      5                          3     4     4        2                 3
4
## 931      5                          3     3     2        1                 2
3
## 938      5                          3     4     1        1                 5
4
## 941      5                          3     2     1        1                 3
3
## 958      5                          4     2     1        1                 1
2
## 1007     4                          4     5     1        3                 4
1
##      Pop Rock Metal.or.Hardrock Punk Hiphop..Rap Reggae..Ska Swing..Jazz
## 13     3    5                 4    2           3           1           1
## 33     3    4                 3    4           4           2           2
## 35     4    5                 3    4           2           3           3
```

```
## 54     4    3                  2    2            3            3            3
## 92     3    5                  5    5            1            5            1
## 125    3    5                  3    3            1            2            4
## 139    2    1                  1    1            3            3            4
## 150    1    2                  2    2            3            2            1
## 230    4    3                  1    4            2            5            3
## 260    3    4                  2    2            2            1            3
## 366    1    5                  4    5            1            5            4
## 372    5    5                  3    3            2            2            5
## 443    5    4                  1    4            3            4            4
## 476    3    5                  4    4            3            4            3
## 503    2    5                  3    4            3            3            4
## 525    2    5                  5    5            2            5            2
## 571    3    3                  1    2            2            1            1
## 620    3    3                  2    2            3            2            3
## 683    4    4                  3    4            3            4            3
## 695    3    5                  4    2            3            3            5
## 743    2    4                  2    1            3            4            2
## 751    3    3                  1    1            5            1            5
## 804    3    5                  4    5            1            1            2
## 847    4    2                  1    1            4            2            4
## 849    3    5                  3    4            1            4            2
## 854    3    3                  1    1            2            3            2
## 931    3    2                  2    3            5            3            1
## 938    5    5                  4    5            4            5            5
## 941    3    3                  1    1            4            4            5
## 958    2    2                  1    1            5            1            2
## 1007   4    1                  1    4            1            1            2
##      Rock.n.roll Alternative Latino Techno..Trance Opera Movies Horror
Thriller
## 13             4           3      2              1     2      5      1
5
## 33             4           4      2              3     1      5      5
5
## 35             4           4      2              1     1      5      2
3
## 54             3           3      5              2     5      5      3
3
## 92             3           1      1              1     1      5      4
4
## 125            5           2      3              1     3      4      5
5
## 139            4           2      3              1     2      5      1
2
## 150            1           1      1              1     2      3      2
2
## 230            3           2      2              3     3      3      1
3
## 260            5           2      5              1     5      3      1
1
```

```
## 366            5           5      1                 2      4       5       1
5
## 372            5           3      5                 2      5       5       1
2
## 443            4           2      2                 2      1       5       5
4
## 476            5           3      4                 1      2       4       4
3
## 503            5           3      1                 3      3       5       3
5
## 525            3           5      2                 1      3       5       3
4
## 571            3           2      2                 1      1       5       4
2
## 620            3           2      3                 2      5       5       2
4
## 683            4           3      2                 5      2       5       2
4
## 695            5           1      5                 4      3       5       4
5
## 743            3           4      5                 5      2       5       2
3
## 751            4           5      5                 1      4       4       3
4
## 804            3           2      1                 1      2       5       3
4
## 847            2           2      3                 5      3       5       3
3
## 849            3           5      1                 2      1       3       1
2
## 854            2           2      3                 1      4       5       3
3
## 931            1           1      3                 3      2       5       3
2
## 938            5           5      5                 2      5       5       1
3
## 941            2           2      1                 5      1       4       4
2
## 958            1           1      2                 2      1       4       4
4
## 1007           3           1      3                 4      1       5       2
5
##      Comedy Romantic Sci.fi War Fantasy.Fairy.tales Animated Documentary
## 13        4        3      1   4                    5        3           3
## 33        5        5      2   3                    5        5           3
## 35        5        4      4   2                    2        5           3
## 54        5        5      1   5                    5        3           3
## 92        5        5      3   1                    5        5           1
## 125       5        4      5   5                    5        5           5
## 139       5        5      1   3                    5        4           4
```

```
## 150       4        2       5   5                   4        4           4
## 230       4        1       2   2                   3        2           3
## 260       5        1       1   4                   3        1           5
## 366       2        2       1   5                   2        2           5
## 372       5        5       3   2                   5        5           3
## 443       5        4       3   3                   5        5           4
## 476       5        5       2   3                   5        5           3
## 503       4        2       5   5                   5        5           3
## 525       3        3       3   3                   4        5           4
## 571       5        3       1   5                   3        3           3
## 620       4        2       2   5                   3        3           5
## 683       4        2       4   5                   5        4           4
## 695       5        3       4   5                   4        4           5
## 743       5        4       3   5                   5        5           4
## 751       5        4       4   4                   5        5           5
## 804       5        4       1   2                   3        2           2
## 847       5        5       5   2                   2        4           4
## 849       3        4       4   2                   1        2           1
## 854       5        5       1   3                   5        3           4
## 931       5        5       2   3                   5        5           3
## 938       5        5       4   2                   4        5           3
## 941       5        3       5   5                   4        3           5
## 958       5        4       4   4                   3        2           3
## 1007      5        1       5   5                   1        5           5
##      Western Action History Psychology Politics Mathematics Physics
Internet PC
## 13         1      1       4          4        4           1       1
3  2
## 33         2      4       4          5        3           1       1
5  4
## 35         1      5       4          5        4           3       1
5  4
## 54         1      5       3          3        4           1       1
3  2
## 92         1      3       1          1        1           1       1
5  5
## 125        5      4       4          4        4           1       3
4  5
## 139        3      2       2          3        2           1       1
3  1
## 150        2      2       2          3        1           5       5
3  5
## 230        3      5       2          1        1           4       2
5  5
## 260        1      1       5          4        4           1       2
2  2
## 366        3      4       5          5        4           1       1
3  2
## 372        3      2       2          5        1           5       3
3  3
```

```
## 443        3      3       2          2        3          3       2
3  4
## 476        1      2       4          5        3          3       2
4  2
## 503        5      5       2          1        4          3       1
5  5
## 525        1      1       3          4        1          3       2
5  2
## 571        1      5       4          3        2          1       1
5  3
## 620        2      4       3          2        2          5       5
5  4
## 683        3      5       3          3        2          4       2
4  4
## 695        2      4       5          5        5          5       3
5  5
## 743        5      5       3          5        3          4       3
5  4
## 751        3      3       4          5        2          4       3
3  3
## 804        1      2       3          3        3          1       1
5  3
## 847        2      3       2          1        1          2       2
5  4
## 849        1      3       1          5        2          1       2
5  3
## 854        4      3       3          3        2          3       3
4  3
## 931        2      3       3          2        2          1       2
5  4
## 938        5      5       3          5        1          5       4
5  3
## 941        4      5       4          3        2          3       3
5  5
## 958        2      5       3          3        3          1       1
4  4
## 1007       2      5       4          1        1          5       4
5  5
##      Economy.Management Biology Chemistry Reading Geography
Foreign.languages
## 13                    1       5         5       5         3
5
## 33                    3       1         1       3         3
3
## 35                    4       3         1       3         2
5
## 54                    2       4         2       4         5
5
## 92                    1       5         1       1         1
5
```

```
## 125                3     2     2     4     4
4
## 139                2     5     4     5     3
5
## 150                3     2     3     2     3
3
## 230                2     3     2     1     5
3
## 260                2     4     3     5     4
4
## 366                4     4     4     4     5
5
## 372                3     5     5     5     2
3
## 443                2     3     3     2     3
3
## 476                2     3     2     5     3
3
## 503                4     1     1     1     1
4
## 525                1     5     4     3     4
3
## 571                2     2     1     1     4
5
## 620                2     3     2     1     5
4
## 683                2     2     1     3     4
3
## 695                3     2     2     2     4
5
## 743                5     4     1     5     4
5
## 751                2     3     2     2     2
2
## 804                2     2     1     2     2
3
## 847                3     1     1     3     2
5
## 849                5     2     2     1     2
3
## 854                3     3     3     4     4
3
## 931                3     2     1     1     3
3
## 938                2     4     2     5     5
4
## 941                1     2     1     2     1
3
## 958                1     1     1     1     1
1
```

```
## 1007                  2       2         1       1         2
2
##      Medicine Law Cars Art.exhibitions Religion Countryside..outdoors
Dancing
## 13          5   2    3               1        1                      5
3
## 33          1   2    3               4        2                      2
1
## 35          3   2    5               3        5                      5
2
## 54          4   3    5               5        5                      4
5
## 92          5   1    1               1        1                      5
5
## 125         4   4    4               5        3                      5
2
## 139         5   1    1               1        5                      5
2
## 150         2   1    2               1        3                      4
1
## 230         2   2    2               2        2                      5
2
## 260         3   4    4               2        3                      5
5
## 366         4   4    5               4        4                      5
1
## 372         5   2    2               3        5                      5
5
## 443         2   2    2               4        3                      3
2
## 476         2   3    1               2        2                      4
2
## 503         1   2    5               1        1                      2
1
## 525         5   1    1               3        3                      5
2
## 571         1   1    5               1        1                      5
1
## 620         2   3    4               1        1                      2
1
## 683         2   2    4               2        4                      4
1
## 695         1   3    4               3        5                      4
3
## 743         4   4    2               3        5                      5
4
## 751         5   3    5               5        5                      2
5
## 804         1   1    3               3        2                      4
1
```

```
## 847          2   1    3                2         2                      3
5
## 849          1   2    1                2         1                      2
2
## 854          3   3    3                3         3                      5
3
## 931          3   2    4                3         3                      4
2
## 938          3   2    3                3         3                      2
2
## 941          1   1    1                2         4                      5
1
## 958          1   1    5                1         1                      3
1
## 1007         1   1    5                1         5                      5
5
##      Musical.instruments Writing Passive.sport Active.sport Gardening
## 13                     4       1             5            3         4
## 33                     2       1             2            2         1
## 35                     3       2             5            3         1
## 54                     4       1             5            5         3
## 92                     1       1             5            3         1
## 125                    5       3             4            5         1
## 139                    5       3             2            4         1
## 150                    1       1             2            3         1
## 230                    4       1             5            3         2
## 260                    2       2             5            2         1
## 366                    3       2             4            3         1
## 372                    5       3             2            5         3
## 443                    5       2             3            4         2
## 476                    5       3             3            3         1
## 503                    3       1             2            3         1
## 525                    1       1             5            1         1
## 571                    2       1             5            5         1
## 620                    1       1             2            1         1
## 683                    1       1             4            1         1
## 695                    5       1             4            5         1
## 743                    3       4             3            5         1
## 751                    1       3             2            5         4
## 804                    4       1             4            5         3
## 847                    2       1             2            2         2
## 849                    2       1             5            1         2
## 854                    3       4             5            3         4
## 931                    4       1             3            1         1
## 938                    5       1             5            2         1
## 941                    5       1             5            1         1
## 958                    1       1             2            1         1
## 1007                   5       1             1            5         5
##      Celebrities Shopping Science.and.technology Theatre Fun.with.friends
## 13             3        2                      3       2                4
```

```
## 33              4        5                      3       3                5
## 35              1        3                      5       3                5
## 54              1        3                      3       5                5
## 92              3        3                      1       3                5
## 125             1        1                      5       4                4
## 139             2        3                      2       2                4
## 150             1        2                      4       2                3
## 230             1        2                      4       2                4
## 260             1        1                      3       5                5
## 366             1        3                      2       3                4
## 372             1        3                      3       3                5
## 443             4        3                      4       4                5
## 476             4        2                      2       3                5
## 503             1        4                      5       1                5
## 525             5        3                      1       4                5
## 571             3        5                      4       3                4
## 620             1        1                      5       1                5
## 683             2        3                      4       3                4
## 695             2        2                      5       2                5
## 743             1        3                      4       4                5
## 751             2        5                      5       5                5
## 804             3        3                      1       3                5
## 847             1        5                      2       2                5
## 849             1        4                      3       1                5
## 854             3        4                      3       5                5
## 931             3        5                      3       2                5
## 938             1        3                      3       4                5
## 941             1        3                      2       2                5
## 958             1        2                      4       2                4
## 1007            1        2                      5       1                5
##      Adrenaline.sports Pets Flying Storm Darkness Heights Spiders Snakes
Rats
## 13                   1    2      1     1        1       1       1      3
1
## 33                   1    5      3     5        5       5       5      5
5
## 35                   5    1      1     2        2       1       2      2
2
## 54                   3    1      3     1        1       1       5      1
3
## 92                   4    1      1     3        1       1       5      5
5
## 125                  5    4      1     1        1       2       1      1
1
## 139                  1    3      1     1        1       1       1      2
2
## 150                  3    1      1     1        2       3       1      2
1
## 230                  5    1      1     1        1       1       1      2
1
```

```
## 260                 1    1       1       1       1       3       1       1
1
## 366                 5    1       1       1       1       1       1       1
1
## 372                 2    3       2       4       1       3       2       3
2
## 443                 2    5       2       1       2       2       2       4
3
## 476                 2    5       2       3       5       1       1       4
3
## 503                 3    1       2       1       1       2       3       3
1
## 525                 5    5       1       2       3       2       2       1
1
## 571                 4    3       1       1       1       4       1       5
4
## 620                 3    1       1       1       2       2       3       5
2
## 683                 3    5       3       1       1       2       2       5
3
## 695                 3    1       2       2       1       1       3       5
2
## 743                 4    1       1       1       2       4       2       2
3
## 751                 5    1       1       1       1       1       1       1
1
## 804                 5    3       1       1       1       2       5       5
4
## 847                 2    5       5       2       2       4       5       5
5
## 849                 4    2       1       1       1       1       1       1
1
## 854                 3    5       1       1       1       1       1       2
3
## 931                 2    1       3       3       3       4       5       5
5
## 938                 4    5       1       3       4       2       3       5
4
## 941                 3    4       1       3       4       5       3       5
1
## 958                 1    1       1       1       1       3       3       3
1
## 1007                1    5       1       1       1       1       1       1
1
##      Ageing Dangerous.dogs Fear.of.public.speaking Healthy.eating
Daily.events
## 13        5              2                       2              3
4
## 33        1              5                       2              3
3
```

```
## 35        1                2                3                3
5
## 54        1                3                5                3
3
## 92        5                5                1                3
3
## 125       1                2                1                4
4
## 139       1                4                3                1
4
## 150       2                3                4                2
2
## 230       3                2                2                2
2
## 260       1                5                1                4
4
## 366       3                1                1                4
4
## 372       1                5                1                1
2
## 443       3                3                2                3
3
## 476       1                2                3                2
3
## 503       2                3                2                3
2
## 525       3                2                5                2
3
## 571       5                4                1                5
3
## 620       4                3                1                1
3
## 683       2                4                3                2
3
## 695       1                2                1                4
3
## 743       1                3                2                3
5
## 751       1                2                1                4
5
## 804       3                3                1                2
3
## 847       4                5                3                3
3
## 849       1                1                1                4
3
## 854       3                4                1                3
3
## 931       3                5                4                4
3
```

```
## 938       4               3                        4               3
3
## 941       5               3                        4               1
3
## 958       1               2                        3               1
1
## 1007      2               5                        5               3
1
##      Prioritising.workload Writing.notes Workaholism Thinking.ahead
## 13                       3             5           4               5
## 33                       1             1           1               2
## 35                       3             1           5               3
## 54                       3             5           2               5
## 92                       3             5           5               5
## 125                      2             2           3               4
## 139                      2             2           1               5
## 150                      3             2           3               2
## 230                      1             2           1               3
## 260                      5             3           4               2
## 366                      3             1           3               4
## 372                      3             3           4               4
## 443                      3             4           3               2
## 476                      1             2           2               3
## 503                      4             2           5               4
## 525                      3             2           3               4
## 571                      3             2           3               3
## 620                      3             5           5               4
## 683                      1             1           2               2
## 695                      3             4           3               5
## 743                      2             5           2               2
## 751                      3             4           4               3
## 804                      1             4           1               4
## 847                      3             4           3               3
## 849                      3             3           4               2
## 854                      5             5           3               3
## 931                      2             3           2               2
## 938                      2             4           1               2
## 941                      2             1           1               3
## 958                      2             1           1               3
## 1007                     3             1           5               5
##      Final.judgement Reliability Keeping.promises Loss.of.interest
## 13                 1           5                5                4
## 33                 1           1                1                1
## 35                 5           4                4                4
## 54                 3           5                5                1
## 92                 5           3                5                3
## 125                2           4                4                1
## 139                2           5                5                5
## 150                3           2                2                2
## 230                3           3                5                2
```

```
## 260                 4           3                 3                 1
## 366                 5           4                 5                 2
## 372                 3           4                 5                 1
## 443                 3           4                 5                 2
## 476                 3           2                 4                 2
## 503                 3           5                 5                 2
## 525                 3           4                 5                 1
## 571                 1           4                 4                 5
## 620                 1           4                 3                 1
## 683                 3           1                 2                 3
## 695                 5           5                 4                 2
## 743                 5           2                 5                 5
## 751                 2           4                 4                 2
## 804                 5           5                 5                 2
## 847                 5           5                 3                 3
## 849                 3           3                 1                 1
## 854                 3           4                 4                 2
## 931                 3           4                 3                 1
## 938                 3           4                 5                 2
## 941                 5           1                 1                 4
## 958                 4           3                 3                 2
## 1007                5           5                 4                 1
##      Friends.versus.money Funniness Fake Criminal.damage Decision.making
## 13                      4         3    1               2                5
## 33                      1         1    1               3                1
## 35                      5         5    1               1                3
## 54                      5         1    1               1                3
## 92                      5         3    1               1                5
## 125                     2         3    1               1                2
## 139                     4         3    1               1                4
## 150                     5         3    3               3                2
## 230                     4         3    3               3                3
## 260                     5         3    1               1                3
## 366                     5         4    2               2                2
## 372                     4         1    1               1                2
## 443                     5         3    1               2                2
## 476                     4         5    2               1                2
## 503                     2         4    2               1                4
## 525                     4         4    2               3                3
## 571                     1         3    2               5                4
## 620                     3         3    2               3                4
## 683                     2         3    3               2                1
## 695                     5         5    1               2                3
## 743                     5         5    2               3                2
## 751                     5         2    2               2                3
## 804                     3         3    1               5                3
## 847                     5         4    2               5                3
## 849                     4         3    2               4                2
## 854                     3         3    1               1                3
## 931                     4         4    2               5                4
```

```
## 938                    4         2    1               1               3
## 941                    4         5    2               5               2
## 958                    4         3    1               4               4
## 1007                   2         1    1               3               5
##      Elections Self.criticism Judgment.calls Hypochondria Empathy
## 13           5              5              2            5       5
## 33           1              1              5            1       5
## 35           5              4              3            1       2
## 54           5              3              5            1       5
## 92           1              3              3            3       5
## 125          3              5              3            1       3
## 139          5              4              5            1       5
## 150          3              1              2            1       2
## 230          4              4              4            1       5
## 260          4              5              5            5       5
## 366          5              2              4            1       2
## 372          5              1              5            1       4
## 443          1              4              4            1       4
## 476          5              4              4            2       5
## 503          5              2              5            2       4
## 525          5              5              4            2       4
## 571          3              2              5            1       3
## 620          1              3              4            1       3
## 683          1              1              1            5       4
## 695          1              5              5            1       5
## 743          2              2              5            2       5
## 751          5              3              4            2       5
## 804          3              3              2            3       5
## 847          2              2              2            3       3
## 849          3              5              4            1       2
## 854          3              4              3            1       3
## 931          1              3              5            3       5
## 938          4              2              5            4       4
## 941          1              2              4            2       4
## 958          5              4              3            2       5
## 1007         5              5              5            1       2
##      Eating.to.survive Giving Compassion.to.animals Borrowed.stuff
Loneliness
## 13                   3      2                    5              5
5
## 33                   1      1                    5              5
1
## 35                   2      3                    1              3
2
## 54                   5      5                    3              5
3
## 92                   3      3                    1              2
2
## 125                  2      4                    2              4
2
```

```
## 139                  2       1                   2                   5
4
## 150                  3       2                   1                   2
3
## 230                  5       3                   3                   4
2
## 260                  1       1                   5                   5
3
## 366                  2       3                   4                   4
2
## 372                  3       3                   4                   4
1
## 443                  1       3                   4                   4
4
## 476                  2       2                   5                   4
3
## 503                  1       3                   2                   4
2
## 525                  1       1                   5                   3
3
## 571                  1       3                   3                   3
3
## 620                  2       3                   5                   4
2
## 683                  2       2                   4                   4
3
## 695                  4       1                   3                   5
5
## 743                  4       1                   4                   2
1
## 751                  3       4                   3                   4
2
## 804                  1       5                   5                   5
3
## 847                  4       3                   5                   5
4
## 849                  1       2                   3                   1
1
## 854                  3       5                   5                   5
3
## 931                  2       5                   2                   4
5
## 938                  2       1                   4                   5
5
## 941                  2       2                   3                   2
2
## 958                  3       1                   5                   4
3
## 1007                 1       4                   3                   4
1
```

```
##      Cheating.in.school Health Changing.the.past God Dreams Charity
## 13                    2      5                  3   1      3       2
## 33                    5      1                  1   3      3       1
## 35                    2      2                  4   5      4       4
## 54                    5      3                  5   5      3       1
## 92                    5      3                  3   5      3       2
## 125                   2      2                  2   1      4       4
## 139                   4      3                  5   5      3       3
## 150                   2      2                  1   4      3       2
## 230                   5      2                  2   5      3       1
## 260                   3      5                  5   5      4       3
## 366                   3      1                  3   5      4       3
## 372                   2      3                  1   5      4       3
## 443                   5      3                  2   5      4       2
## 476                   5      3                  2   5      3       2
## 503                   5      2                  2   4      4       1
## 525                   4      3                  4   5      3       1
## 571                   5      4                  4   3      4       3
## 620                   3      5                  2   1      3       1
## 683                   3      2                  4   5      3       2
## 695                   4      3                  3   5      2       2
## 743                   5      1                  2   5      4       3
## 751                   3      3                  2   5      3       5
## 804                   5      5                  5   5      3       3
## 847                   4      4                  5   5      3       2
## 849                   5      3                  1   5      4       1
## 854                   3      5                  3   5      4       3
## 931                   4      4                  3   4      3       2
## 938                   4      4                  1   3      4       2
## 941                   5      4                  5   4      2       1
## 958                   5      3                  3   4      3       1
## 1007                  1      3                  4   5      3       3
##      Number.of.friends Waiting New.environment Mood.swings
## 13                   3       2               1           4
## 33                   5       2               5           2
## 35                   4       4               3           2
## 54                   5       1               4           2
## 92                   3       1               4           4
## 125                  4       4               4           2
## 139                  4       5               5           2
## 150                  2       2               4           3
## 230                  4       3               4           2
## 260                  4       1               5           2
## 366                  3       4               4           2
## 372                  5       3               4           2
## 443                  3       4               4           3
## 476                  5       3               2           3
## 503                  4       3               5           1
## 525                  2       1               3           3
## 571                  5       3               5           3
```

```
## 620                    4       3               3           3
## 683                    3       3               5           4
## 695                    4       2               5           4
## 743                    5       2               5           4
## 751                    3       3               4           2
## 804                    3       2               5           2
## 847                    2       2               4           4
## 849                    5       5               4           2
## 854                    5       4               4           4
## 931                    2       3               4           5
## 938                    1       2               4           4
## 941                    4       2               4           4
## 958                    2       3               3           3
## 1007                   3       5               5           1
##      Appearence.and.gestures Socializing Achievements
## 13                         4           2            3
## 33                         2           4            2
## 35                         3           4            3
## 54                         1           5            2
## 92                         3           5            3
## 125                        3           2            3
## 139                        3           5            3
## 150                        2           3            4
## 230                        4           4            3
## 260                        2           4            3
## 366                        4           3            3
## 372                        4           5            3
## 443                        4           3            3
## 476                        2           1            4
## 503                        3           3            4
## 525                        2           3            1
## 571                        5           4            3
## 620                        4           3            3
## 683                        2           3            4
## 695                        4           5            3
## 743                        1           5            4
## 751                        4           3            2
## 804                        4           3            3
## 847                        3           2            4
## 849                        5           3            2
## 854                        4           4            4
## 931                        4           3            3
## 938                        2           3            1
## 941                        4           1            5
## 958                        3           3            3
## 1007                       3           3            3
##      Responding.to.a.serious.letter Children Assertiveness Getting.angry
## 13                                 4        5             5             5
## 33                                 3        3             4             1
## 35                                 3        3             4             1
```

```
## 54                                1          5            5              2
## 92                                3          4            4              5
## 125                               1          4            4              1
## 139                               5          5            4              1
## 150                               3          5            2              2
## 230                               4          4            4              1
## 260                               2          3            3              3
## 366                               3          4            4              1
## 372                               2          5            4              1
## 443                               2          5            5              3
## 476                               4          4            4              2
## 503                               2          3            5              1
## 525                               4          3            2              2
## 571                               3          5            4              4
## 620                               2          3            5              3
## 683                               4          5            3              3
## 695                               5          4            3              1
## 743                               3          4            4              2
## 751                               1          5            3              3
## 804                               1          4            3              3
## 847                               2          5            4              3
## 849                               4          4            4              1
## 854                               2          5            3              3
## 931                               2          4            3              4
## 938                               2          5            3              4
## 941                               3          3            4              3
## 958                               4          3            2              4
## 1007                              5          5            4              1
##      Knowing.the.right.people Public.speaking Unpopularity Life.struggles
## 13                          3                3            2               5
## 33                          3                4            3               3
## 35                          4                4            4               1
## 54                          2                2            5               2
## 92                          5                5            5               2
## 125                         3                2            4               1
## 139                         2                5            5               5
## 150                         3                5            4               2
## 230                         3                4            3               2
## 260                         3                3            3               2
## 366                         1                1            3               2
## 372                         3                2            3               2
## 443                         4                4            4               4
## 476                         3                3            3               4
## 503                         5                2            2               1
## 525                         4                4            4               3
## 571                         3                5            5               3
## 620                         5                1            3               1
## 683                         3                3            4               1
## 695                         4                1            3               1
## 743                         4                2            2               1
```

```
## 751                          5               1            3              2
## 804                          3               3            3              3
## 847                          3               5            5              4
## 849                          5               2            5              2
## 854                          4               4            3              5
## 931                          3               4            4              5
## 938                          4               3            5              5
## 941                          2               2            4              4
## 958                          2               5            4              3
## 1007                         2               5            1              1
##      Happiness.in.life Energy.levels Small...big.dogs Personality
## 13                   4             3                4           3
## 33                   4             5                1           4
## 35                   3             5                3           3
## 54                   4             5                4           3
## 92                   5             5                1           3
## 125                  3             4                5           3
## 139                  4             4                3           3
## 150                  3             2                3           2
## 230                  5             4                3           3
## 260                  4             5                3           3
## 366                  4             4                4           3
## 372                  5             4                2           4
## 443                  4             3                5           3
## 476                  4             3                3           3
## 503                  4             4                3           4
## 525                  3             2                3           3
## 571                  4             4                3           3
## 620                  4             4                3           4
## 683                  4             3                3           3
## 695                  4             4                5           3
## 743                  4             5                5           4
## 751                  4             4                5           3
## 804                  3             4                3           4
## 847                  4             3                1           3
## 849                  5             5                3           5
## 854                  3             4                3           3
## 931                  3             3                3           3
## 938                  4             3                3           2
## 941                  4             4                4           3
## 958                  3             2                4           3
## 1007                 4             4                3           5
##      Finding.lost.valuables Getting.up Interests.or.hobbies
Parents..advice
## 13                        1          3                   2
4
## 33                        1          5                   5
3
## 35                        5          2                   3
2
```

```
## 54                    3          5          5
4
## 92                    3          5          4
4
## 125                   3          3          4
3
## 139                   4          3          3
5
## 150                   3          2          3
3
## 230                   1          3          4
4
## 260                   5          3          5
3
## 366                   2          2          4
3
## 372                   3          3          5
3
## 443                   3          2          4
3
## 476                   3          5          5
3
## 503                   1          2          4
4
## 525                   3          3          3
4
## 571                   1          3          3
3
## 620                   3          3          1
3
## 683                   3          5          2
3
## 695                   5          5          5
3
## 743                   3          5          4
1
## 751                   1          3          3
3
## 804                   2          5          4
4
## 847                   5          4          4
4
## 849                   1          4          5
2
## 854                   4          1          5
5
## 931                   4          3          4
3
## 938                   2          5          5
2
```

```
## 941                          2          5                    3
4
## 958                          4          4                    2
4
## 1007                         3          1                    3
4
##      Questionnaires.or.polls Finances Shopping.centres Branded.clothing
## 13                         2        4                1                 1
## 33                         3        1                3                 1
## 35                         2        3                3                 4
## 54                         4        3                5                 3
## 92                         3        5                5                 5
## 125                        2        3                3                 3
## 139                        5        4                1                 1
## 150                        3        3                2                 1
## 230                        2        1                2                 2
## 260                        5        4                1                 3
## 366                        1        3                3                 3
## 372                        3        3                3                 2
## 443                        1        2                4                 2
## 476                        2        1                2                 2
## 503                        3        2                5                 5
## 525                        5        4                2                 5
## 571                        1        3                5                 5
## 620                        1        2                2                 4
## 683                        3        1                4                 4
## 695                        3        3                2                 3
## 743                        3        1                4                 5
## 751                        3        4                3                 3
## 804                        1        3                3                 2
## 847                        5        4                4                 3
## 849                        2        3                4                 5
## 854                        3        4                2                 1
## 931                        3        3                5                 2
## 938                        4        5                2                 2
## 941                        3        2                5                 5
## 958                        3        3                2                 5
## 1007                       3        3                1                 1
##      Entertainment.spending Spending.on.looks Spending.on.gadgets
## 13                         2                3                   2
## 33                         4                5                   1
## 35                         3                3                   1
## 54                         3                1                   2
## 92                         5                3                   2
## 125                        3                4                   3
## 139                        1                1                   1
## 150                        2                1                   2
## 230                        4                1                   2
## 260                        4                3                   1
## 366                        3                4                   2
```

```
## 372                          3                 3                     4
## 443                          4                 5                     3
## 476                          5                 2                     1
## 503                          4                 4                     5
## 525                          3                 2                     2
## 571                          3                 5                     5
## 620                          3                 2                     4
## 683                          4                 4                     4
## 695                          3                 2                     4
## 743                          5                 4                     4
## 751                          3                 3                     3
## 804                          3                 3                     3
## 847                          4                 4                     4
## 849                          5                 5                     5
## 854                          1                 3                     2
## 931                          2                 3                     2
## 938                          4                 2                     3
## 941                          4                 4                     4
## 958                          3                 3                     3
## 1007                         1                 1                     5
##      Spending.on.healthy.eating Age Height Weight Number.of.siblings
## 13                            3  24    168     55                 10
## 33                            1  20    158     46                  4
## 35                            2  20    177     67                  5
## 54                            1  18    164     51                  4
## 92                            2  18    168     50                  4
## 125                           5  20    176     69                  4
## 139                           1  20    168     50                  4
## 150                           4  19    184     85                  5
## 230                           2  21    173     73                  5
## 260                           3  19    175     72                  4
## 366                           4  24    175     70                  5
## 372                           3  19    164     53                  4
## 443                           3  18    163     58                  6
## 476                           3  18    172     60                  4
## 503                           5  22    193     86                  6
## 525                           2  19    171     60                  4
## 571                           5  23    189     88                  4
## 620                           5  27    175     83                  4
## 683                           1  19    172     75                  4
## 695                           4  21    187     73                  4
## 743                           5  26    183     90                  5
## 751                           3  22    175     86                  6
## 804                           3  27    173     79                  5
## 847                           4  23    171     54                  4
## 849                           5  19    184     60                  4
## 854                           2  30    175     68                  4
## 931                           4  18    165     45                  5
## 938                           5  18    167     62                  4
## 941                           4  16    172     59                  4
```

```
## 958                           3  20    175     65                  5
## 1007                          3  27    183     80                  5
```

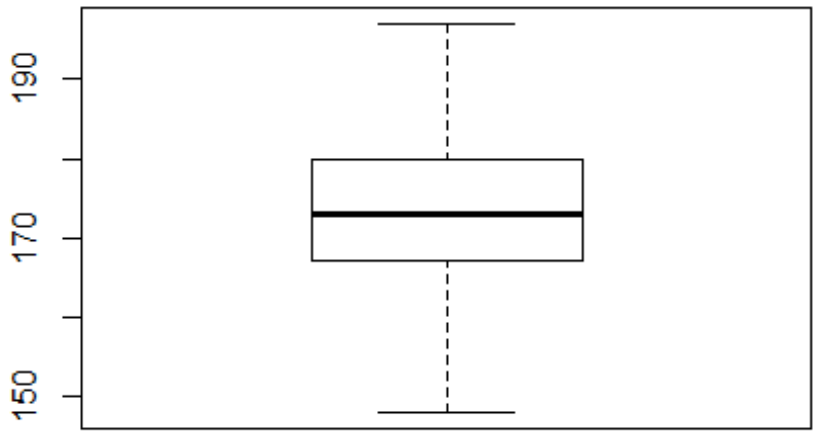
```r
# Function for outlier treatment
# Capping and Flooring function
treat_outlier <- function(x){
  qnt <- quantile(x, probs=c(.25, .75), na.rm = T)
  caps <- quantile(x, probs=c(.05, .95), na.rm = T)
  H <- 1.5 * IQR(x, na.rm = T)
  x[x < (qnt[1] - H)]  <- caps[1]
  x[x > (qnt[2] + H)] <- caps[2]
  return(as.data.frame(x))
}

impu_num_compl$Age <- treat_outlier(impu_num_compl$Age)$x
impu_num_compl$Height <- treat_outlier(impu_num_compl$Height)$x
impu_num_compl$Weight <- treat_outlier(impu_num_compl$Weight)$x

dim(impu_num_compl)
```

```
## [1] 1010  139
```

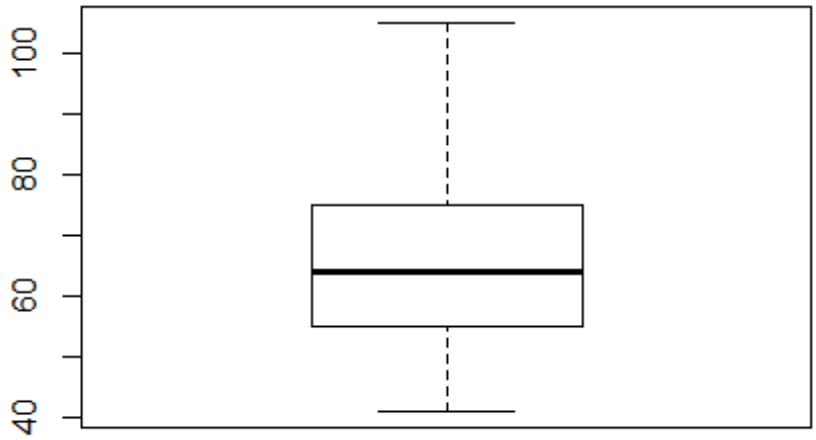
```r
dim(impu_cat_compl)
```

```
## [1] 1010   11
```

```r
boxplot(impu_num_compl$Height)
```



```r
boxplot(impu_num_compl$Weight)
```




```r
data_transformed = cbind(impu_num_compl, impu_cat_compl)
dim(data_transformed)
```

```
## [1] 1010  150
```

Corelation Analysis:

```r
data_num_trans <- data_transformed[,!sapply(data_transformed, is.factor)]
dim(data_num_trans)
```

```
## [1] 1010  139
```

```r
music_trans = data_transformed[,names(music_data)]
dim(music_trans)
```

```
## [1] 1010   19
```

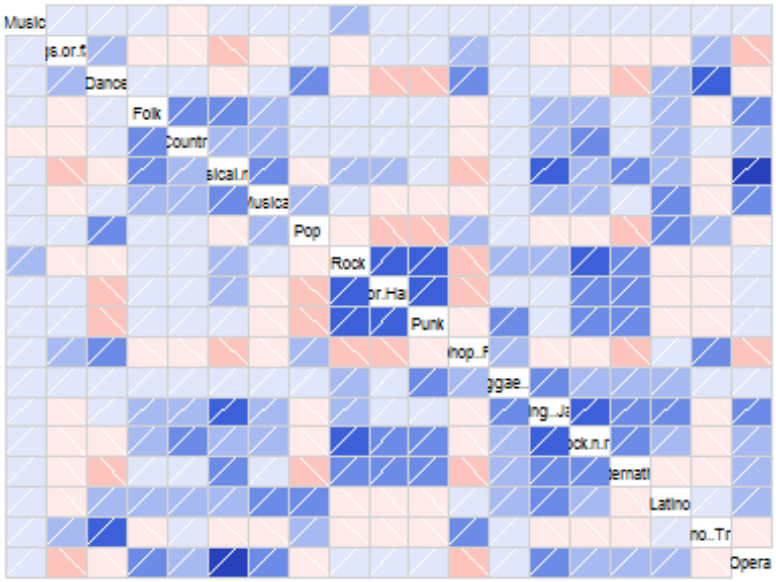
```r
library(corrgram)
```

```
## Warning: package 'corrgram' was built under R version 3.6.2
```

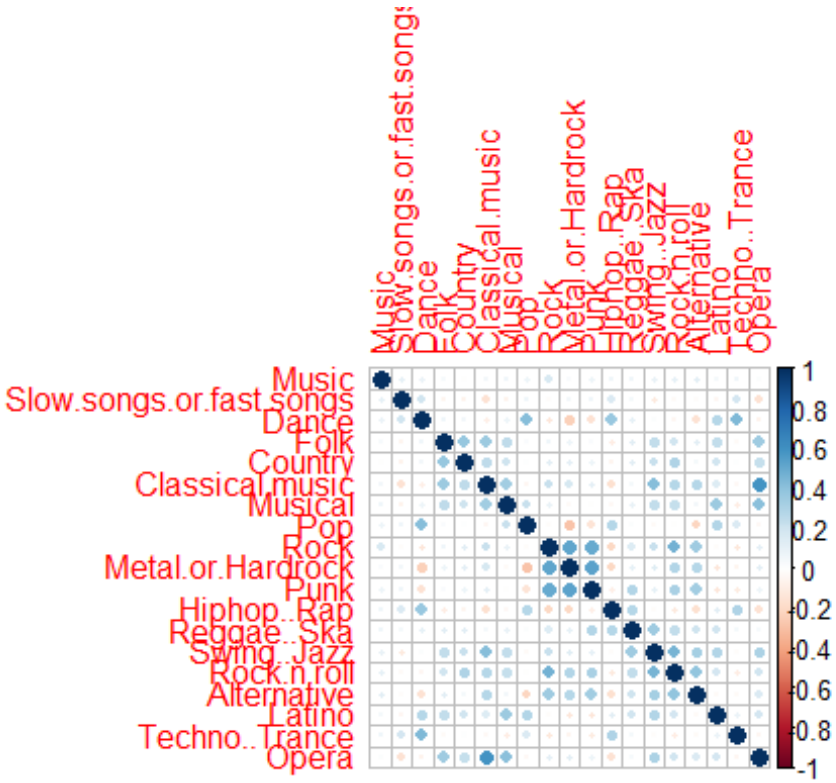
```
## Registered S3 method overwritten by 'seriation':
##   method         from
##   reorder.hclust gclus
```

```
##
## Attaching package: 'corrgram'
```

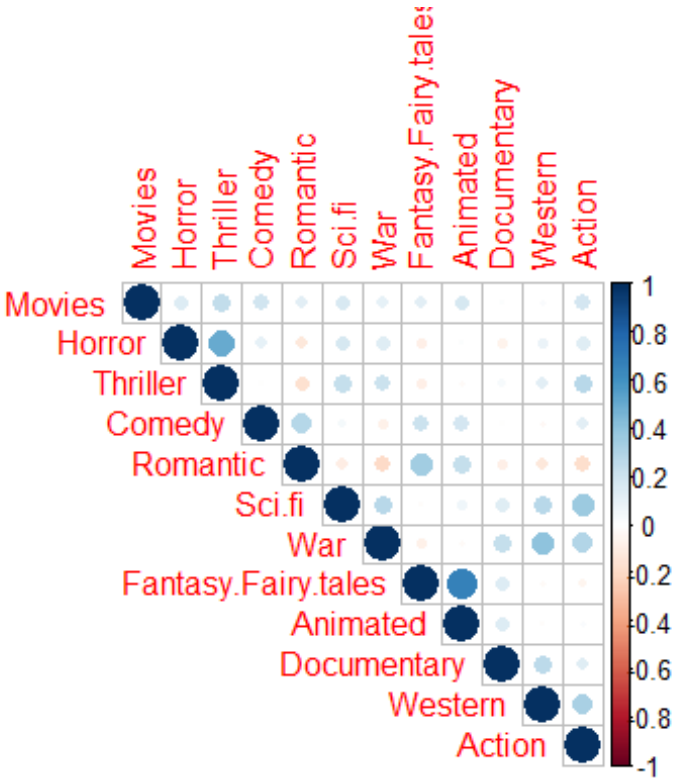
```
## The following object is masked from 'package:lattice':
##
##     panel.fill

corrgram(music_trans)
```



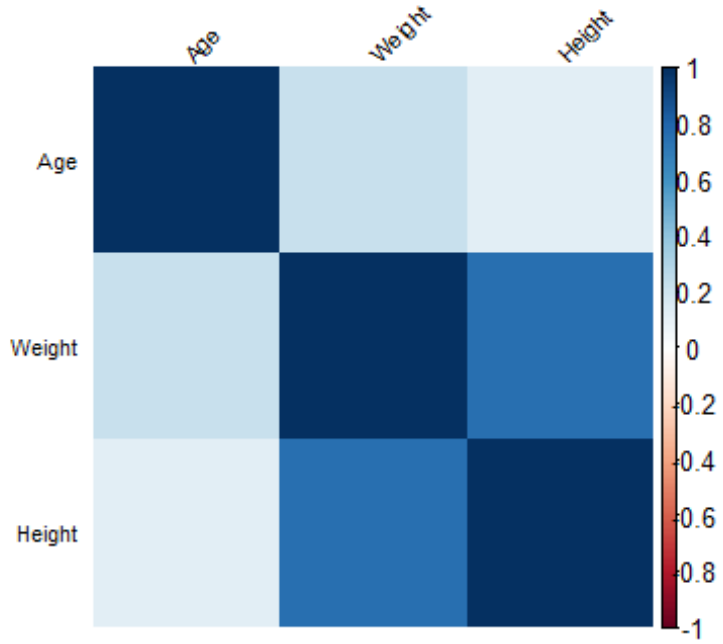

```
library(corrplot)

## Warning: package 'corrplot' was built under R version 3.6.2

## corrplot 0.84 loaded

music_cor = cor(music_trans)
corrplot(music_cor)
```



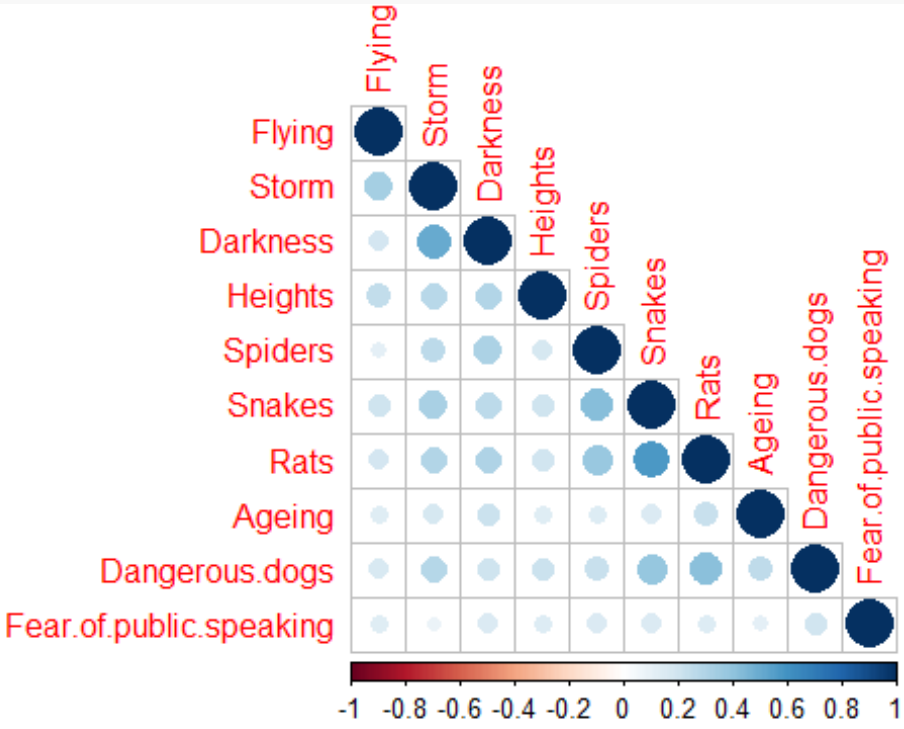

```
movie_trans = data_transformed[,names(movie_data)]
dim(movie_trans)

## [1] 1010   12

movie_cor = cor(movie_trans)
corrplot(movie_cor,type="upper")
```



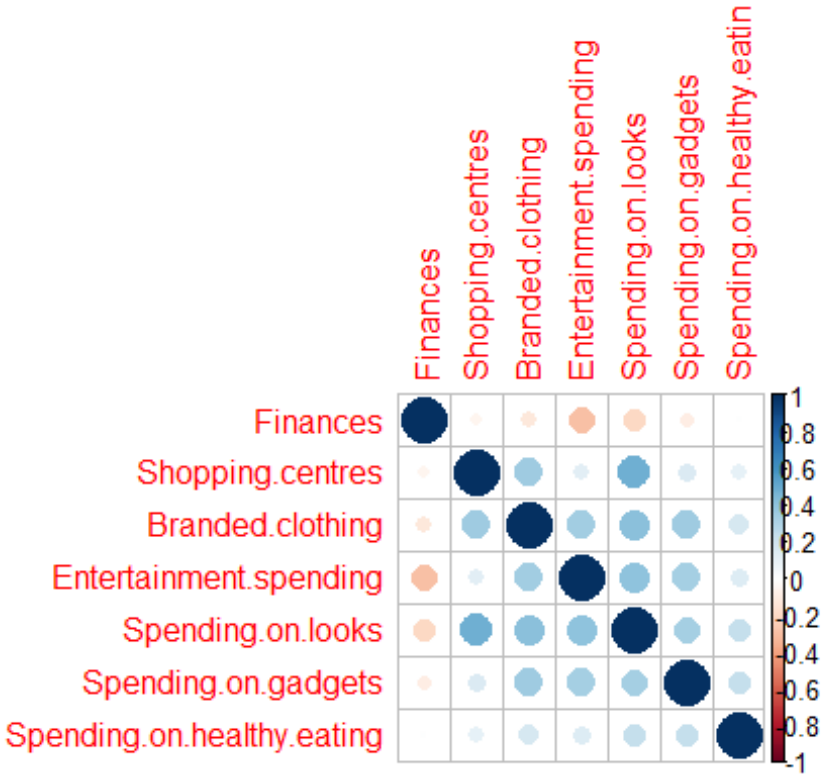

```
demo_cor <- cor(data_transformed[,c('Age','Weight','Height')])
corrplot(demo_cor, method="shade", shade.col=NA, tl.col="black", tl.srt=45,
tl.cex =0.7)
```



```
phobia_cor = cor(data_transformed[,names(phobia_data)])
corrplot(phobia_cor,type = "lower")
```

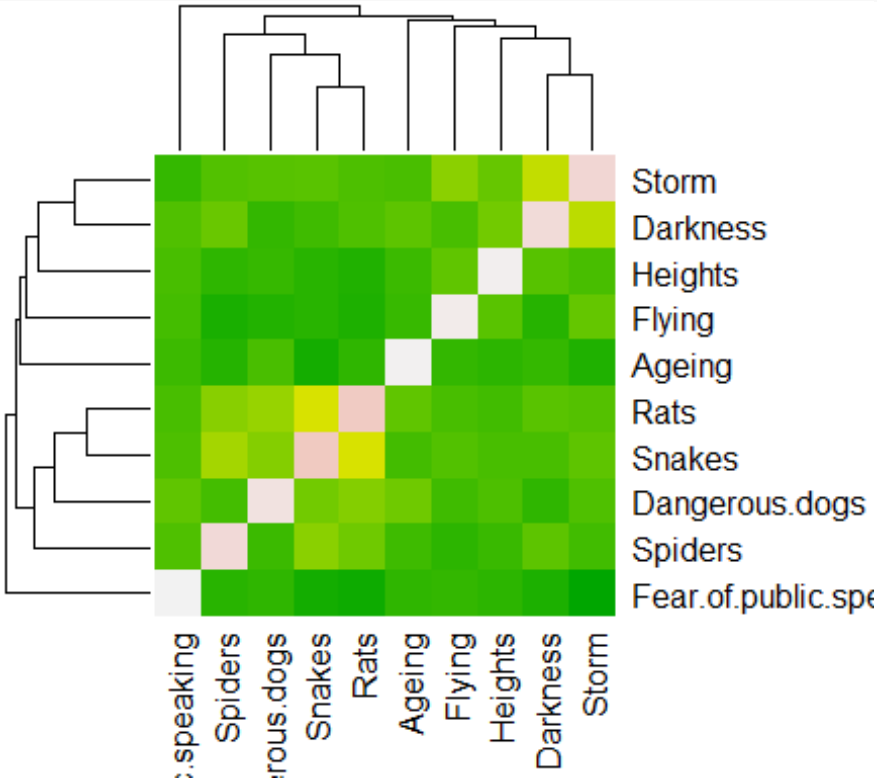



```
spend_cor = cor(data_transformed[,names(spend_data)])
corrplot(spend_cor)
```



Heat map

```
heatmap(phobia_cor, scale="column", col = terrain.colors(256))
```



Exploratory Data Analysis

```
data_transformed$Gender
```

```
##    [1] female female female female female male   female male   female
female
##   [11] female female female female female male   female female male   male
##   [21] male   male   female female female female female female male
female
##   [31] male   female female female male   female female male   female
female
##   [41] female male   female female female male   female female female
female
##   [51] female female female female female female female female male   male
##   [61] male   male   male   male   female male   male   female female
female
##   [71] male   male   female male   male   male   male   female female
female
##   [81] female male   female female female male   male   female female
female
##   [91] female female female male   male   male   male   male   male
female
##  [101] female male   female male   male   male   male   female female male
##  [111] male   female female female female female female female male
female
##  [121] male   male   female female male   female female female female
female
##  [131] female male   female female female male   male          female
female
##  [141] female female male   female male   female male   male   male   male
##  [151] female male   male   female male   female male   male   female male
##  [161] male   female male   male   male   female female male   female
female
##  [171] male   male   male   male   male   female male   male   female male
##  [181] male   male   female male   female female female female female
female
##  [191] female female female male   male   male   female female male   male
##  [201] male          male   female female female male   female female male
##  [211] male   female male   female female male   female female male   male
##  [221] male   male   female female male   male          female female male
##  [231] female female female female female female female female female
female
##  [241] male   female female female female female male   female female
female
##  [251] female female female female female female female male   female male
##  [261] male   female female female female female female female female
female
##  [271] female male   female female female female female male   male
female
##  [281] female male   female male   male   female female female male   male
```

```
##  [291] female male   female female female female male   male   female
female
##  [301] female male   female female female female female female female
female
##  [311] male   female male   female male   male   female male   female
female
##  [321] male   female female male   female male   female female male
female
##  [331] female male   female female female male   male   male   female
female
##  [341] female male   female female female female male   male   male
female
##  [351] male   female male   female female male   male   male   male
female
##  [361] female female female female male   male   male   male   female male
##  [371] female female male   male   female female female female female male
##  [381] female female female male   female male   female female female
female
##  [391] male   female female male   male   male   female female female
female
##  [401] male   female male   male   female female female female female
female
##  [411] male   female female male   male   female female male   female
female
##  [421] female female female female female female female male   female
female
##  [431] female male   male   female male   female male   female female male
##  [441] female female female female female female male   female female
female
##  [451] male   male   female female female female male   male   female
female
##  [461] male   male   female female female female male   female female male
##  [471] female male   male   male   male   female female female male
female
##  [481] female male   male   female female female female female male
female
##  [491] female female female male   female female female female female male
##  [501] female female male   female female male   male   female male
female
##  [511] male   male   female male   male   male   male   female female male
##  [521] female female female male   female female male   female male   male
##  [531] female male   female male   female male   female male   female male
##  [541] male   female        male   male   male   male   male   female
female
##  [551] female female female female male   female female female female
female
##  [561] female male   male   male   male   female female male   female
female
##  [571] male   male   female male   female female male   female female male
##  [581] male   female male   male   female male   male   female female
```

```
female
##  [591] male   female female female male   male   male   male   male   male
##  [601] female female male   female female male   male   female male   male
##  [611] male   female male   female female male   male   female female male
##  [621] male          female male   female female female female male
female
##  [631] female female male   male   female female male   male   female male
##  [641] female male   male   female female male   male   female female
female
##  [651] male   male   male   female male   female female female male   male
##  [661] female female female male   female female female male   male   male
##  [671] female female female female male   female female female female
female
##  [681] female female male   female female female male   male   female male
##  [691] male   female male   female male   female female female female
female
##  [701] female female male   male   female female male   female male
female
##  [711] female female female female female male   male   female female male
##  [721] female female female female female male   male   male   female male
##  [731] female female female female female female female female male   male
##  [741] male   female male   male   male   male   female female female male
##  [751] female female female female male   female male   female male   male
##  [761] female male   male   male   female male   female male   male
female
##  [771] female male   female female female female male   male   female
female
##  [781] male   female female male   male   male   male   male   female male
##  [791] female female male   male   male   female male   male   female male
##  [801] male   female female female female female male   male   male   male
##  [811] male   male   female male   female male   male   male   male
female
##  [821] female male   female male   female female female female male
female
##  [831] female female female male   male   male   male   male   female
female
##  [841] female male   female female male   female female female male
female
##  [851] female male   male   female male   male   female male   male   male
##  [861] male   female male   male   male   female male   female male
female
##  [871] female male   male   male   female female male   male   male   male
##  [881] female female female female female female male   male   female
female
##  [891] male   male   male   female female male   male   male   female male
##  [901] male   female male   male   female male   female female male
female
##  [911] female female female female female female male   male   female
female
##  [921] female male   female female female female male   female female
```

```
female
##  [931] female male   female female        female female female female
female
##  [941] male   female male   female female male   male   female female
female
##  [951] male   male   male   female female female male   male   female
female
##  [961] female male   female male   male   female female male   male   male
##  [971] male   male   female female female female female male   female male
##  [981] female female male   female female female female male   male
female
##  [991] male   male   male   female female female male   female male   male
## [1001] female female male   female male   female male   female female male
## Levels:  female male
```

```
a = split(data_transformed$Gender, 3, drop =TRUE)
```

```
str(data_transformed$Gender)
```

```
##  Factor w/ 3 levels "","female","male": 2 2 2 2 2 3 2 3 2 2 ...
```

```
library(ggplot2)
library(gridExtra)
```

```
## Warning: package 'gridExtra' was built under R version 3.6.2
```

```
library(magrittr) # needs to be run every time you start R and want to use
%>%
library(dplyr)
```

```
##
## Attaching package: 'dplyr'
```

```
## The following object is masked from 'package:gridExtra':
##
##     combine
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

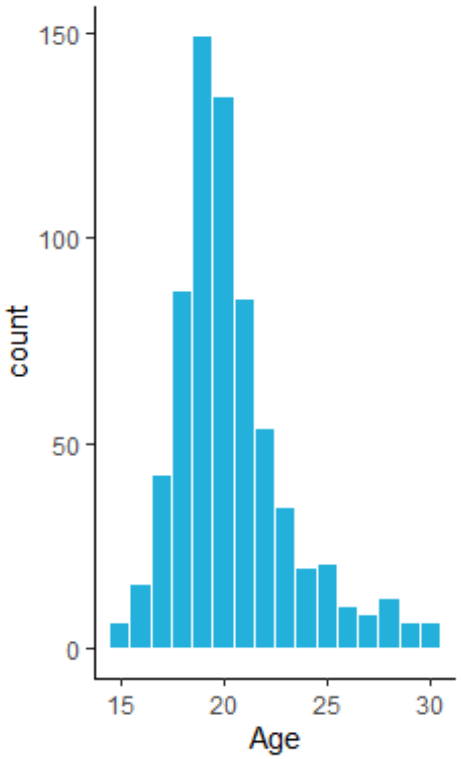
```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
library(reshape2)
```

```
## Warning: package 'reshape2' was built under R version 3.6.2
```

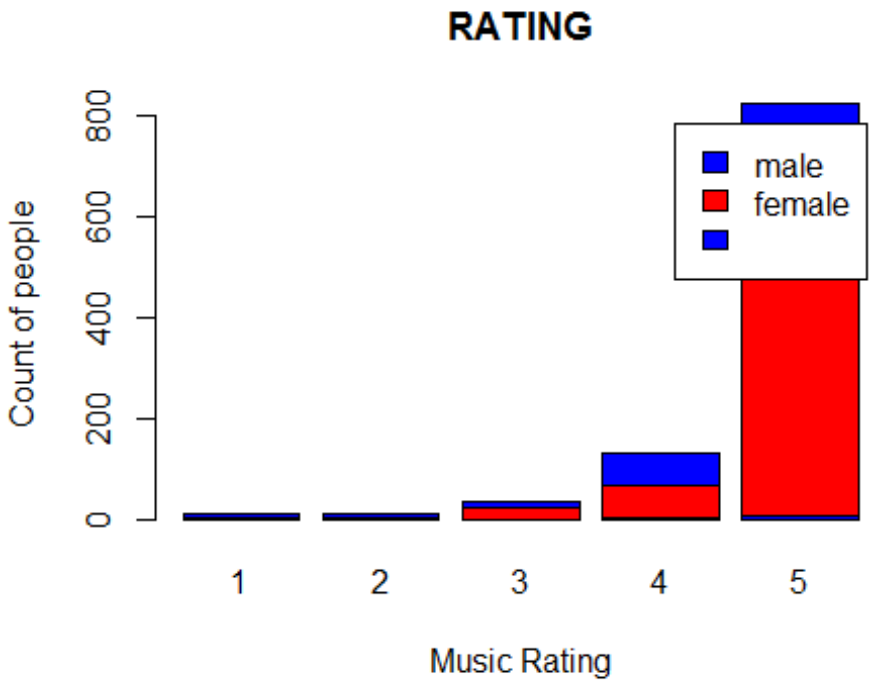
```
p1 =ggplot(na.omit(data), aes(x=Age)) + geom_bar(fill = "#23b0db") +
theme_bw() + theme(panel.border = element_blank(), panel.grid.major =
element_blank(),
```

```
panel.grid.minor = element_blank(), axis.line = element_line(colour =
"black"))

age = data %>% select(Age) %>% group_by(Age) %>% summarize(count = n()) %>%
arrange(desc(count))
age = tableGrob(as.data.frame(age))
grid.arrange(p1, head(age, 7), ncol=2)
```

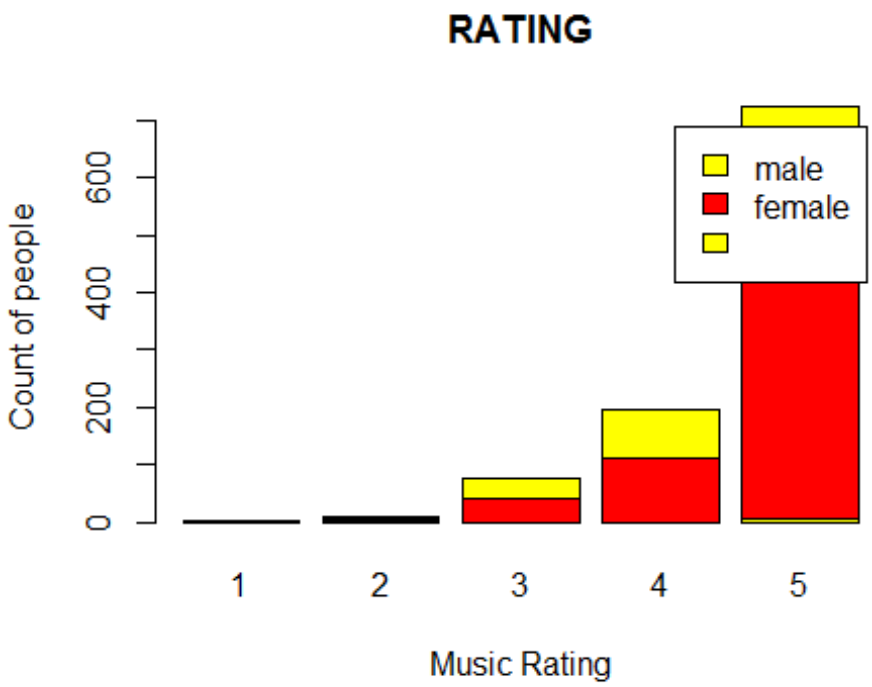


	Age	count
1	19	210
2	20	194
3	21	127
4	18	123
5	22	84
6	17	53

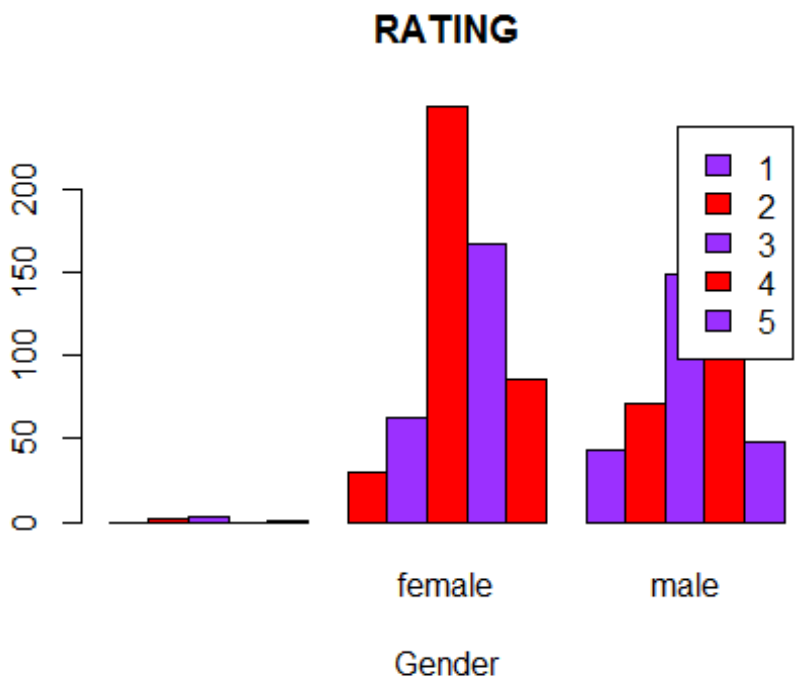
```
counts <- table(data_transformed$Gender, data_transformed$Music)
barplot(counts, main="RATING",
        xlab="Music Rating", ylab = "Count of people", col=c("blue","red"),
        legend = rownames(counts))
```



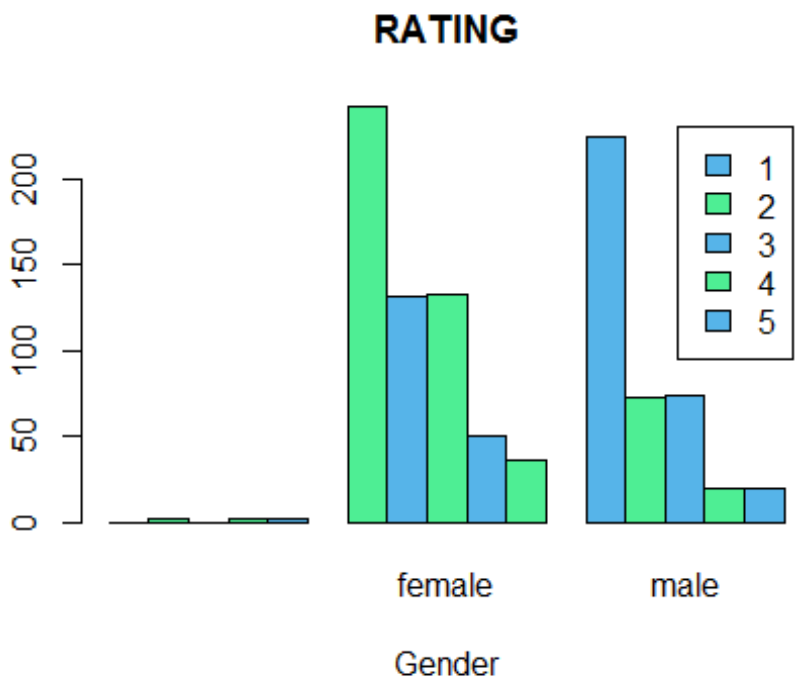

```
counts <- table(data_transformed$Gender, data_transformed$Movies)
barplot(counts, main="RATING",
        xlab="Music Rating", ylab = "Count of people", col=c("Yellow","red"),
        legend = rownames(counts))
```



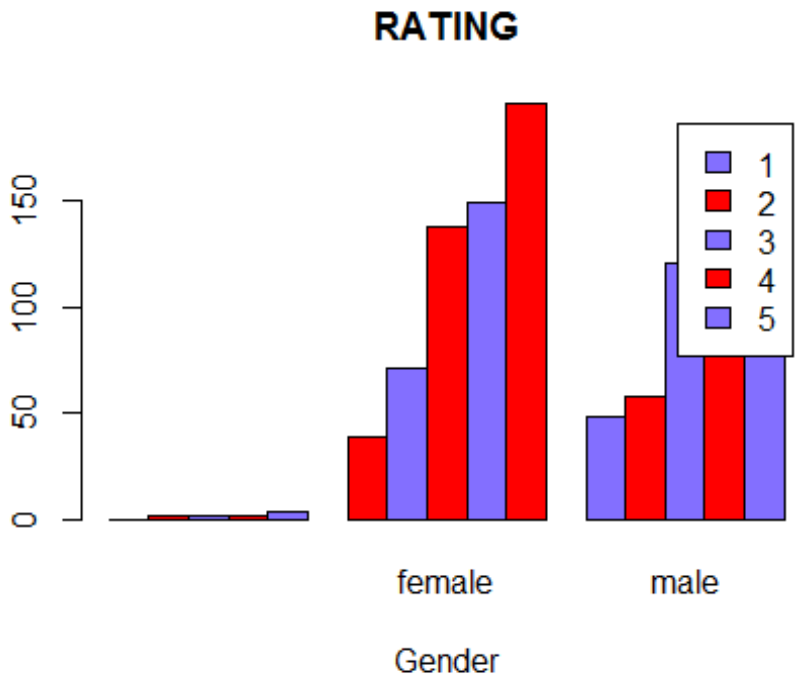

```r
#Health
counts <- table(data_transformed$Health, data_transformed$Gender)
barplot(counts, main="RATING",
        xlab="Gender", col=c("purple1","red"),
        legend = rownames(counts), beside=TRUE)
```



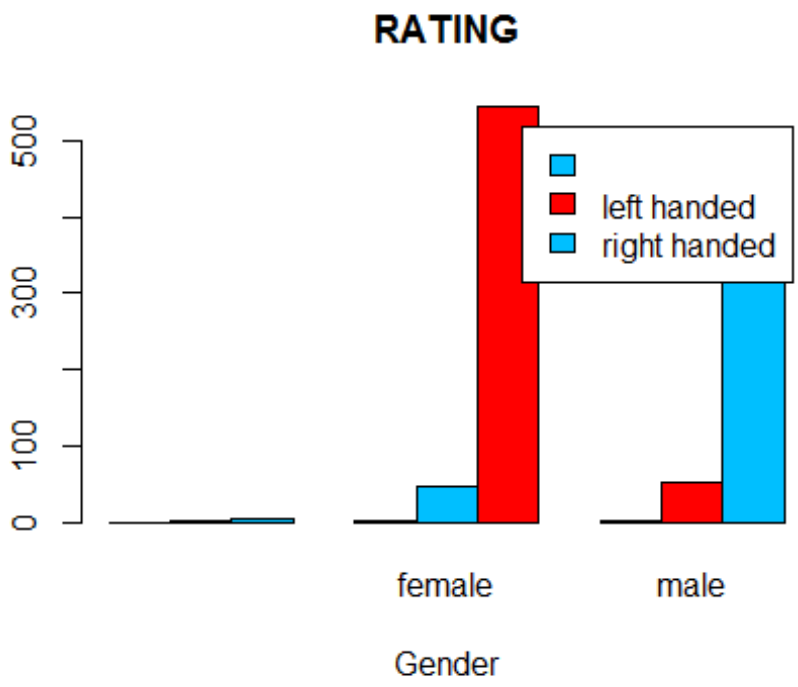

```r
#Flying_----- Phobias
counts <- table(data_transformed$Flying, data_transformed$Gender)
barplot(counts, main="RATING",
        xlab="Gender", col=c("#56B4E9","seagreen2"),
        legend = rownames(counts), beside=TRUE)
```




```r
#Public Speaking-----Phobias
counts <- table(data_transformed$Public.speaking, data_transformed$Gender)
barplot(counts, main="RATING",
        xlab="Gender", col=c("slateblue1","red"),
        legend = rownames(counts), beside=TRUE)
```




```r
#Left/Right Handed
counts <- table(data_transformed$Left...right.handed,
data_transformed$Gender)
barplot(counts, main="RATING",
        xlab="Gender", col=c("deepskyblue1","red"),
        legend = rownames(counts), beside=TRUE)
```


RATING
500
300
100
0
left handed
right handed
female
male
Gender