FML Assignment 1

2023-09-10

```
Gdata <-read.csv("C:/Users/rupes/OneDrive/Desktop/Kent State University/FML/Assignment 1/Gaming
review data.csv")
```

```
Gdata
```

```
##                                          App Category Rating   Reviews
## 1                                     ROBLOX     GAME    4.5   4447388
## 2                             Subway Surfers     GAME    4.5  27722264
## 3                           Candy Crush Saga     GAME    4.4  22426677
## 4                                  Solitaire     GAME    4.7    254258
## 5                             Bubble Shooter     GAME    4.5    148897
## 6                      Hello Kitty Nail Salon     GAME    4.2    369203
## 7                               Clash Royale     GAME    4.6  23133508
## 8                               Temple Run 2     GAME    4.3   8118609
## 9                                        Pou     GAME    4.3  10485308
## 10                                Helix Jump     GAME    4.2   1497361
## 11                              Block Puzzle     GAME    4.6     59800
## 12                            Angry Birds Rio     GAME    4.4   2610526
## 13                     Plants vs. Zombies FREE     GAME    4.4   4066989
## 14                                Sonic Dash     GAME    4.5   3778921
## 15                     Candy Crush Soda Saga     GAME    4.4   6198563
## 16                        Zombie Hunter King     GAME    4.3     10306
## 17                            Clash of Clans     GAME    4.6  44891723
## 18              Block Puzzle Classic Legend !     GAME    4.2     17039
## 19                                   PAC-MAN     GAME    4.2    685981
## 20                 Super Jim Jump - pixel 3d     GAME    4.5     10393
## 21                               8 Ball Pool     GAME    4.5  14198297
## 22                        Bubble Witch 3 Saga     GAME    4.7   1732263
## 23                               Word Search     GAME    4.7    295241
## 24                                    Granny     GAME    4.5   1135631
## 25                        Angry Birds Classic     GAME    4.4   5566669
## 26                                 Flow Free     GAME    4.3   1295557
## 27                       Race the Traffic Moto     GAME    3.8    270687
## 28                  Barbieâ„¢ Fashion Closet     GAME    4.1     68057
## 29                     Candy Crush Jelly Saga     GAME    4.3   1300490
## 30                          Hill Climb Racing     GAME    4.4   8923587
## 31                      Marble - Temple Quest     GAME    4.3     42053
## 32                              Shooting King     GAME    4.4    257724
## 33                           Zombie Catchers     GAME    4.7    990491
## 34                           Farm Heroes Saga     GAME    4.4   7614130
## 35                         Geometry Dash World     GAME    4.6    760628
## 36                          My Talking Angela     GAME    4.5   9881829
## 37                       Cut the Rope FULL FREE     GAME    4.4   2123381
## 38                             Subway Surfers     GAME    4.5  27723193
## 39                                     ROBLOX     GAME    4.5   4447346
## 40                                        Pou     GAME    4.3  10485334
## 41                               8 Ball Pool     GAME    4.5  14198602
## 42                            Clash of Clans     GAME    4.6  44891723
## 43                           Candy Crush Saga     GAME    4.4  22428456
## 44                     Plants vs. Zombies FREE     GAME    4.4   4066980
## 45                              Cooking Fever     GAME    4.5   3197865
## 46                                Score! Hero     GAME    4.6   5418675
## 47                          My Talking Angela     GAME    4.5   9881908
## 48                             Bubble Shooter     GAME    4.5    148895
## 49 Miraculous Ladybug & Cat Noir - The Official Game     GAME    4.5    183846
## 50                                 Wordscapes     GAME    4.8    230710
##     Size       Installs Type Content.Rating                 Genres
```

```
## 1    67M   100,000,000 Free    Everyone 10+ Adventure;Action & Adventure
## 2    76M 1,000,000,000 Free    Everyone 10+                      Arcade
## 3    74M   500,000,000 Free        Everyone                      Casual
## 4    23M    10,000,000 Free        Everyone                        Card
## 5    46M    10,000,000 Free        Everyone                      Casual
## 6    24M    50,000,000 Free        Everyone          Casual;Pretend Play
## 7    97M   100,000,000 Free    Everyone 10+                    Strategy
## 8    62M   500,000,000 Free        Everyone                      Action
## 9    24M   500,000,000 Free        Everyone                      Casual
## 10   33M   100,000,000 Free        Everyone                      Action
## 11 7.8M     5,000,000 Free        Everyone                      Puzzle
## 12   46M   100,000,000 Free        Everyone                      Arcade
## 13   69M   100,000,000 Free    Everyone 10+                    Strategy
## 14   75M   100,000,000 Free        Everyone                      Arcade
## 15   67M   100,000,000 Free        Everyone                      Casual
## 16   50M     1,000,000 Free      Mature 17+                      Action
## 17   98M   100,000,000 Free    Everyone 10+                    Strategy
## 18 4.9M     5,000,000 Free        Everyone                      Puzzle
## 19   37M   100,000,000 Free        Everyone                      Arcade
## 20   18M     1,000,000 Free        Everyone                      Arcade
## 21   52M   100,000,000 Free        Everyone                      Sports
## 22   78M    50,000,000 Free        Everyone                      Puzzle
## 23 3.9M    10,000,000 Free        Everyone                        Word
## 24   59M    50,000,000 Free            Teen                      Arcade
## 25   97M   100,000,000 Free        Everyone                      Arcade
## 26   11M   100,000,000 Free        Everyone                      Puzzle
## 27   38M    10,000,000 Free            Teen                      Racing
## 28   85M    10,000,000 Free        Everyone            Casual;Creativity
## 29   78M    50,000,000 Free        Everyone                      Puzzle
## 30   63M   100,000,000 Free        Everyone                      Racing
## 31   24M    10,000,000 Free        Everyone                      Puzzle
## 32   69M    10,000,000 Free    Everyone 10+                      Sports
## 33   75M    10,000,000 Free        Everyone                      Action
## 34   70M   100,000,000 Free        Everyone                      Casual
## 35   63M    10,000,000 Free        Everyone                      Arcade
## 36   99M   100,000,000 Free        Everyone                      Casual
## 37   49M   100,000,000 Free        Everyone                      Puzzle
## 38   76M 1,000,000,000 Free    Everyone 10+                      Arcade
## 39   67M   100,000,000 Free    Everyone 10+ Adventure;Action & Adventure
## 40   24M   500,000,000 Free        Everyone                      Casual
## 41   52M   100,000,000 Free        Everyone                      Sports
## 42   98M   100,000,000 Free    Everyone 10+                    Strategy
## 43   74M   500,000,000 Free        Everyone                      Casual
## 44   69M   100,000,000 Free    Everyone 10+                    Strategy
## 45   82M   100,000,000 Free        Everyone                      Arcade
## 46   96M   100,000,000 Free        Everyone                      Sports
## 47   99M   100,000,000 Free        Everyone                      Casual
## 48   46M    10,000,000 Free        Everyone                      Casual
## 49   99M    10,000,000 Free        Everyone                      Action
## 50   87M    10,000,000 Free        Everyone                        Word
##     Last.Updated  Current.Ver   Android.Ver
## 1      31-Jul-18 2.347.225742    4.1 and up
```

```
## 2        12-Jul-18        1.90.0     4.1 and up
## 3         5-Jul-18     1.129.0.2     4.1 and up
## 4         1-Aug-18        2.137.0    4.1 and up
## 5        17-Jul-18        1.20.1 4.0.3 and up
## 6        17-Apr-18            1.5     4.1 and up
## 7        27-Jun-18          2.3.2     4.1 and up
## 8         5-Jul-18         1.49.1     4.0 and up
## 9        25-May-18         1.4.77     4.0 and up
## 10        9-Apr-18          1.0.6     4.1 and up
## 11        6-Mar-18            2.9     2.3 and up
## 12        3-Jul-18          2.6.9     4.1 and up
## 13        6-Jul-18          2.2.00    4.1 and up
## 14       26-Jul-18       3.8.5.Go     4.1 and up
## 15       10-Jul-18        1.118.4     4.1 and up
## 16        1-Aug-18          1.0.8     2.3 and up
## 17       15-Jul-18       10.322.16    4.1 and up
## 18       13-Apr-18            2.9 2.3.3 and up
## 19       15-May-18          6.6.3     4.1 and up
## 20       11-Jul-18       2.2.3181     4.0 and up
## 21       31-Jul-18          4.0.0 4.0.3 and up
## 22       17-Jul-18          4.8.4     3.0 and up
## 23        6-Jun-18          1.1.3     3.0 and up
## 24       29-May-18        1.4.0.1     4.0 and up
## 25       24-May-18          7.9.3     4.1 and up
## 26       11-Apr-18              4     4.1 and up
## 27       20-Jul-18         1.0.16 4.0.3 and up
## 28       30-Jul-18          1.3.7     4.1 and up
## 29       20-Jul-18         2.1.10     4.0 and up
## 30        2-Jul-18         1.37.2     4.2 and up
## 31       21-Jun-18            4.9 4.0.3 and up
## 32       25-May-18          1.4.2 4.0.3 and up
## 33       24-May-18         1.0.27     4.1 and up
## 34       26-Jul-18          5.1.8     2.3 and up
## 35       22-Dec-17           1.03     4.0 and up
## 36        3-Jul-18       3.7.2.51     4.1 and up
## 37        5-Jul-18          3.7.2     4.1 and up
## 38       12-Jul-18         1.90.0     4.1 and up
## 39       31-Jul-18 2.347.225742      4.1 and up
## 40       25-May-18         1.4.77     4.0 and up
## 41       31-Jul-18          4.0.0 4.0.3 and up
## 42       15-Jul-18       10.322.16    4.1 and up
## 43        5-Jul-18      1.129.0.2     4.1 and up
## 44        6-Jul-18          2.2.00    4.1 and up
## 45       12-Jul-18          2.8.0 4.0.3 and up
## 46       13-Jun-18          1.751     4.4 and up
## 47        3-Jul-18       3.7.2.51     4.1 and up
## 48       17-Jul-18         1.20.1 4.0.3 and up
## 49       30-Jul-18          1.0.6     4.4 and up
## 50        2-Aug-18         1.0.47     4.1 and up
```

```
# 1
summary(Gdata)
```

```
##      App               Category              Rating          Reviews
##  Length:50          Length:50           Min.   :3.800    Min.   :    10306
##  Class :character   Class :character    1st Qu.:4.325    1st Qu.:   276826
##  Mode  :character   Mode  :character    Median :4.500    Median : 2904196
##                                         Mean   :4.438    Mean   : 7293879
##                                         3rd Qu.:4.500    3rd Qu.: 9642268
##                                         Max.   :4.800    Max.   :44891723
##      Size              Installs              Type          Content.Rating
##  Length:50          Length:50           Length:50         Length:50
##  Class :character   Class :character    Class :character  Class :character
##  Mode  :character   Mode  :character    Mode  :character  Mode  :character
##
##
##
##     Genres           Last.Updated         Current.Ver       Android.Ver
##  Length:50          Length:50           Length:50         Length:50
##  Class :character   Class :character    Class :character  Class :character
##  Mode  :character   Mode  :character    Mode  :character  Mode  :character
##
##
##
```

```
# 2
mean(Gdata$Rating)
```

```
## [1] 4.438
```

```
median(Gdata$Rating)
```

```
## [1] 4.5
```

```
min(Gdata$Rating)
```

```
## [1] 3.8
```

```
max(Gdata$Rating)
```

```
## [1] 4.8
```

```
sum(Gdata$Rating)
```

```
## [1] 221.9
```

```
sd(Gdata$Reviews)
```

```
## [1] 10776381
```

```
var(Gdata$Rating)
```

```
## [1] 0.03097551
```

```
str(Gdata$Genres)
```

```
##  chr [1:50] "Adventure;Action & Adventure" "Arcade" "Casual" "Card" ...
```

```
# 3 Descriptive Statistics for the selection of quantitative and categorical variables
```

```
table(Gdata$App)
```

```
##
##                                                    8 Ball Pool
##                                                         2
##                                             Angry Birds Classic
##                                                         1
##                                                Angry Birds Rio
##                                                         1
##                                      Barbieâ„¢ Fashion Closet
##                                                         1
##                                                  Block Puzzle
##                                                         1
##                                Block Puzzle Classic Legend !
##                                                         1
##                                                Bubble Shooter
##                                                         2
##                                          Bubble Witch 3 Saga
##                                                         1
##                                        Candy Crush Jelly Saga
##                                                         1
##                                             Candy Crush Saga
##                                                         2
##                                        Candy Crush Soda Saga
##                                                         1
##                                                Clash of Clans
##                                                         2
##                                                  Clash Royale
##                                                         1
##                                                 Cooking Fever
##                                                         1
##                                        Cut the Rope FULL FREE
##                                                         1
##                                             Farm Heroes Saga
##                                                         1
##                                                     Flow Free
##                                                         1
##                                        Geometry Dash World
##                                                         1
##                                                        Granny
##                                                         1
##                                                    Helix Jump
##                                                         1
##                                        Hello Kitty Nail Salon
##                                                         1
##                                            Hill Climb Racing
##                                                         1
##                                        Marble - Temple Quest
##                                                         1
## Miraculous Ladybug & Cat Noir - The Official Game
##                                                         1
##                                            My Talking Angela
##                                                         2
##                                                      PAC-MAN
```

```
##                                                   1
##                        Plants vs. Zombies FREE
##                                                   2
##                                            Pou
##                                                   2
##                          Race the Traffic Moto
##                                                   1
##                                         ROBLOX
##                                                   2
##                                    Score! Hero
##                                                   1
##                                  Shooting King
##                                                   1
##                                       Solitaire
##                                                   1
##                                     Sonic Dash
##                                                   1
##                                  Subway Surfers
##                                                   2
##                         Super Jim Jump - pixel 3d
##                                                   1
##                                   Temple Run 2
##                                                   1
##                                    Word Search
##                                                   1
##                                     Wordscapes
##                                                   1
##                                 Zombie Catchers
##                                                   1
##                              Zombie Hunter King
##                                                   1
```

```
str(Gdata$App)
```

```
##   chr [1:50] "ROBLOX" "Subway Surfers" "Candy Crush Saga" "Solitaire" ...
```

```
# 4 Transforming the Variables

log(Gdata$Rating)
```

```
##  [1] 1.504077 1.504077 1.481605 1.547563 1.504077 1.435085 1.526056 1.458615
##  [9] 1.458615 1.435085 1.526056 1.481605 1.481605 1.504077 1.481605 1.458615
## [17] 1.526056 1.435085 1.435085 1.504077 1.504077 1.547563 1.547563 1.504077
## [25] 1.481605 1.458615 1.335001 1.410987 1.458615 1.481605 1.458615 1.481605
## [33] 1.547563 1.481605 1.526056 1.504077 1.481605 1.504077 1.504077 1.458615
## [41] 1.504077 1.526056 1.481605 1.481605 1.504077 1.526056 1.504077 1.504077
## [49] 1.504077 1.568616
```
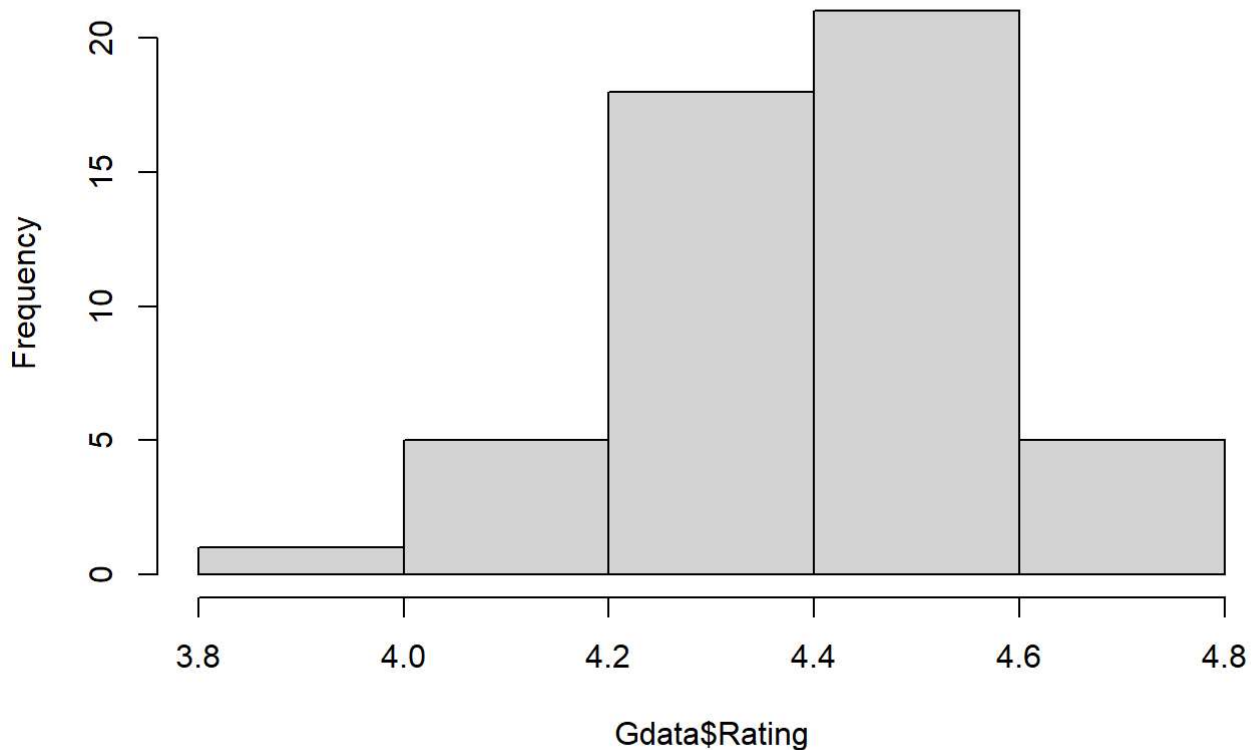
```
t <- Gdata$Rating-mean(Gdata$Rating)/sd(Gdata$Rating)

t
```

```
##  [1] -20.71611 -20.71611 -20.81611 -20.51611 -20.71611 -21.01611 -20.61611
##  [8] -20.91611 -20.91611 -21.01611 -20.61611 -20.81611 -20.81611 -20.71611
## [15] -20.81611 -20.91611 -20.61611 -21.01611 -21.01611 -20.71611 -20.71611
## [22] -20.51611 -20.51611 -20.71611 -20.81611 -20.91611 -21.41611 -21.11611
## [29] -20.91611 -20.81611 -20.91611 -20.81611 -20.51611 -20.81611 -20.61611
## [36] -20.71611 -20.81611 -20.71611 -20.71611 -20.91611 -20.71611 -20.61611
## [43] -20.81611 -20.81611 -20.71611 -20.61611 -20.71611 -20.71611 -20.71611
## [50] -20.41611
```

```
# 5 Plotting one variable

hist(Gdata$Rating, main = "Histogram for Ratings")
```

Histogram for Ratings


```
# 6 Scatterplot

plot(Gdata$Rating, Gdata$Reviews, main = "Scatterplot")
```

Scatterplot