FML-ASSIGNMENT-01

ANURODH-SINGH

2023-09-27

```r
data <- read.csv("C:/Users/ASUS/Desktop/FML/ASSIGNMENTS/71 Centuries of Virat Kohli.csv")
data
```

```
##    Score Out.Not.Out     Against Batting.Order Inn. Strike.Rate
## 1    116         Out   Australia             6    2          NA
## 2    103         Out New Zealand             5    2          NA
## 3    103         Out     England             5    2          NA
## 4    107         Out   Australia             5    2          NA
## 5    119         Out South Africa            4    1          NA
## 6    105     Not Out New Zealand             4    4          NA
## 7    115         Out   Australia             4    2          NA
## 8    141         Out   Australia             4    4          NA
## 9    169         Out   Australia             4    2          NA
## 10   147         Out   Australia             4    2          NA
## 11   103         Out   Sri Lanka             4    2          NA
## 12   200         Out West Indies             4    1          NA
## 13   211         Out New Zealand             4    1          NA
## 14   167         Out     England             4    1          NA
## 15   235         Out     England             4    2          NA
## 16   204         Out  Bangladesh             4    1          NA
## 17   103     Not Out   Sri Lanka             4    3          NA
## 18   104     Not Out   Sri Lanka             4    3          NA
## 19   213         Out   Sri Lanka             4    2          NA
## 20   243         Out   Sri Lanka             4    1          NA
## 21   153         Out South Africa            4    2          NA
## 22   149         Out     England             4    2          NA
## 23   103         Out     England             4    3          NA
## 24   139         Out West Indies             4    1          NA
## 25   123         Out   Australia             4    2          NA
## 26   254     Not Out South Africa            4    1          NA
## 27   136         Out  Bangladesh             4    2          NA
## 28   107         Out   Sri Lanka             4    2       93.85
## 29   102     Not Out  Bangladesh             3    2      107.37
## 30   118         Out   Australia             3    2       97.52
## 31   105         Out New Zealand             3    1      100.96
## 32   100     Not Out  Bangladesh             4    1      120.48
## 33   107         Out     England             4    1      115.05
## 34   112     Not Out     England             4    2      114.28
## 35   117         Out West Indies             4    2       95.12
## 36   133     Not Out   Sri Lanka             4    2      154.65
## 37   108         Out   Sri Lanka             3    1       90.00
## 38   183         Out    Pakistan             3    2      123.64
```

```
## 39   106         Out     Sri Lanka           3   1      93.80
## 40   128    Not Out       Sri Lanka           3   2     107.56
## 41   102         Out    West Indies           3   1     122.89
## 42   115         Out       Zimbabwe           3   2     106.48
## 43   100    Not Out        Australia          3   2     192.30
## 44   115    Not Out        Australia          3   2     174.24
## 45   123         Out     New Zealand          3   2     110.81
## 46   136         Out      Bangladesh          3   2     111.47
## 47   127         Out     West Indies          3   1     111.40
## 48   139    Not Out        Sri Lanka          4   2     110.31
## 49   107         Out        Pakistan          3   1      84.90
## 50   138         Out   South Africa           3   1      98.57
## 51   117         Out        Australia         3   1     100.00
## 52   106         Out        Australia         3   2     115.21
## 53   154    Not Out      New Zealand          3   2     114.92
## 54   122         Out         England          3   2     116.19
## 55   111    Not Out     West Indies           3   2      96.52
## 56   131         Out       Sri Lanka          3   1     136.45
## 57   110    Not Out        Sri Lanka          3   2      94.82
## 58   121         Out     New Zealand          3   1      96.80
## 59   113         Out     New Zealand          3   1     106.60
## 60   112         Out   South Africa           3   2      94.11
## 61   160    Not Out   South Africa            3   1     100.62
## 62   129    Not Out   South Africa            3   2     134.37
## 63   140         Out     West Indies          3   2     130.84
## 64   157    Not Out     West Indies           3   1     121.71
## 65   107         Out     West Indies          3   2      89.91
## 66   104         Out        Australia         3   2      92.85
## 67   116         Out        Australia         3   1      96.67
## 68   123         Out        Australia         3   2     129.47
## 69   120         Out     West Indies          3   1      96.00
## 70   114    Not Out     West Indies           3   2     115.15
## 71   122    Not Out       Afganistan          1   1     200.00
##                                            Venue        Column1  H.A       Date
## 1                                   Adelaide Oval      Adelaide  Away 24-01-2012
## 2                         M. Chinnaswamy Stadium      Bangalore  Home 31-08-2012
## 3            Vidarbha Cricket Association Stadium        Nagpur  Home 13-12-2012
## 4                  M. A. Chidambaram Stadium         Chennai  Home 22-02-2013
## 5                             Wanderers Stadium  Johannesburg  Away 18-12-2013
## 6                                 Basin Reserve    Wellington  Away 14-02-2014
## 7                                 Adelaide Oval      Adelaide  Away 09-12-2014
## 8                                 Adelaide Oval      Adelaide  Away 09-12-2014
## 9                       Melbourne Cricket Ground     Melbourne  Away 26-12-2014
## 10                         Sydney Cricket Ground        Sydney  Away 06-01-2015
## 11                    Galle International Stadium         Galle  Away 12-08-2015
## 12                   Sir Vivian Richards Stadium   North Sound  Away 21-07-2016
## 13                               Holkar Stadium        Indore  Home 08-10-2016
## 14                     ACA-VDCA Cricket Stadium  Visakhapatnam  Home 17-11-2016
## 15                             Wankhede Stadium        Mumbai  Home 08-12-2016
## 16   Rajiv Gandhi International Cricket Stadium     Hyderabad  Home 09-02-2017
## 17                    Galle International Stadium         Galle  Away 26-07-2017
## 18                                  Eden Gardens      Kolkata  Home 16-11-2017
## 19            Vidarbha Cricket Association Stadium        Nagpur  Home 24-11-2017
## 20                       Feroz Shah Kotla Ground         Delhi  Home 02-12-2017
```

```
## 21                    SuperSport Park      Centurion Away 13-01-2018
## 22          Edgbaston Cricket Ground     Birmingham Away 01-08-2018
## 23                      Trent Bridge     Nottingham Away 18-08-2018
## 24 Saurashtra Cricket Association Stadium      Rajkot Home 04-10-2018
## 25                     Perth Stadium          Perth Away 14-12-2018
## 26 Maharashtra Cricket Association Stadium       Pune Home 10-10-2019
## 27                      Eden Gardens        Kolkata Home 22-11-2019
## 28                      Eden Gardens        Kolkata Home 24-12-2009
## 29        Sher-e-Bangla Cricket Stadium        Dhaka Away 11-01-2010
## 30                  APCA-VDCA Stadium  Visakhapatnam Home 20-10-2010
## 31                     Nehru Stadium       Guwahati Home 28-11-2010
## 32        Sher-e-Bangla Cricket Stadium        Dhaka Away 19-02-2011
## 33                    Sophia Gardens        Cardiff Away 16-09-2011
## 34           Feroz Shah Kotla Ground          Delhi Home 17-10-2011
## 35                  APCA-VDCA Stadium  Visakhapatnam Home 02-12-2011
## 36                     Bellerive Oval         Hobart Away 28-02-2012
## 37        Sher-e-Bangla Cricket Stadium        Dhaka Away 13-03-2012
## 38        Sher-e-Bangla Cricket Stadium        Dhaka Away 18-03-2012
## 39                      MRIC Stadium     Hambantota Away 21-07-2012
## 40              R. Premadasa Stadium        Colombo Away 31-07-2012
## 41                  Queen's Park Oval  Port of Spain Away 05-07-2013
## 42                 Harare Sports Club         Harare Away 24-07-2013
## 43             Sawai Mansingh Stadium         Jaipur Home 16-10-2013
## 44                       VCA Stadium         Nagpur Home 30-10-2013
## 45                       McLean Park         Napier Away 19-01-2014
## 46       Khan Shaheb Osman Ali Stadium       Fatullah Away 26-02-2014
## 47                      HPCA Stadium    Dharamshala Home 17-10-2014
## 48        JSCA International Stadium         Ranchi Home 16-11-2014
## 49                     Adelaide Oval       Adelaide Away 15-02-2015
## 50          M. A. Chidambaram Stadium        Chennai Home 22-10-2015
## 51          Melbourne Cricket Ground      Melbourne Away 17-01-2016
## 52                       Manuka Oval       Canberra Away 20-01-2016
## 53 Punjab Cricket Association IS Bindra Stadium       Mohali Home 23-10-2016
## 54 Maharashtra Cricket Association Stadium       Pune Home 15-01-2017
## 55                       Sabina Park       Kingston Away 06-07-2017
## 56              R. Premadasa Stadium        Colombo Away 31-08-2017
## 57              R. Premadasa Stadium        Colombo Away 03-09-2017
## 58                  Wankhede Stadium         Mumbai Home 22-10-2017
## 59                Green Park Stadium         Kanpur Home 29-10-2017
## 60           Kingsmead Cricket Ground         Durban Away 01-02-2018
## 61           Newlands Cricket Ground      Cape Town Away 07-02-2018
## 62                    SuperSport Park      Centurion Away 16-02-2018
## 63                       ACA Stadium       Guwahati Home 21-10-2018
## 64           ACA-VDCA Cricket Stadium  Visakhapatnam Home 24-10-2018
## 65 Maharashtra Cricket Association Stadium       Pune Home 27-10-2018
## 66                     Adelaide Oval       Adelaide Away 15-01-2019
## 67      Vidarbha Cricket Association Stadium       Nagpur Home 05-03-2019
## 68        JSCA International Stadium         Ranchi Home 08-03-2019
## 69                  Queen's Park Oval  Port of Spain Away 11-08-2019
## 70                  Queen's Park Oval  Port of Spain Away 14-08-2019
## 71       Dubai International Cricket Stadium          Dubai Away 08-09-2022
##       Result Format Man.of.the.Match Captain  X
## 1     Lost    Test              No      No NA
## 2     Won     Test             Yes      No NA
```

```
## 3       Drawn   Test           No     No NA
## 4         Won   Test           No     No NA
## 5       Drawn   Test           No     No NA
## 6       Drawn   Test           No     No NA
## 7        Lost   Test           No    Yes NA
## 8        Lost   Test           No    Yes NA
## 9       Drawn   Test           No     No NA
## 10      Drawn   Test           No    Yes NA
## 11       Lost   Test           No    Yes NA
## 12        Won   Test           No    Yes NA
## 13        Won   Test           No    Yes NA
## 14        Won   Test          Yes    Yes NA
## 15        Won   Test          Yes    Yes NA
## 16        Won   Test          Yes    Yes NA
## 17        Won   Test           No    Yes NA
## 18      Drawn   Test           No    Yes NA
## 19        Won   Test          Yes    Yes NA
## 20      Drawn   Test          Yes    Yes NA
## 21       Lost   Test           No    Yes NA
## 22       Lost   Test           No    Yes NA
## 23        Won   Test          Yes    Yes NA
## 24        Won   Test           No    Yes NA
## 25       Lost   Test           No    Yes NA
## 26        Won   Test          Yes    Yes NA
## 27        Won   Test           No    Yes NA
## 28        Won    ODI           No     No NA
## 29        Won    ODI          Yes     No NA
## 30        Won    ODI          Yes     No NA
## 31        Won    ODI          Yes     No NA
## 32        Won    ODI           No     No NA
## 33 Lost (D/L)    ODI           No     No NA
## 34        Won    ODI          Yes     No NA
## 35        Won    ODI          Yes     No NA
## 36        Won    ODI          Yes     No NA
## 37        Won    ODI          Yes     No NA
## 38        Won    ODI          Yes     No NA
## 39        Won    ODI          Yes     No NA
## 40        Won    ODI          Yes     No NA
## 41  Won (D/L)    ODI          Yes    Yes NA
## 42        Won    ODI          Yes    Yes NA
## 43        Won    ODI           No     No NA
## 44        Won    ODI          Yes     No NA
## 45       Lost    ODI           No     No NA
## 46        Won    ODI          Yes    Yes NA
## 47        Won    ODI          Yes     No NA
## 48        Won    ODI           No    Yes NA
## 49        Won    ODI          Yes     No NA
## 50        Won    ODI          Yes     No NA
## 51       Lost    ODI           No     No NA
## 52       Lost    ODI           No     No NA
## 53        Won    ODI          Yes     No NA
## 54        Won    ODI           No    Yes NA
## 55        Won    ODI          Yes    Yes NA
## 56        Won    ODI          Yes    Yes NA
```

```
## 57      Won   ODI          No    Yes NA
## 58     Lost   ODI          No    Yes NA
## 59      Won   ODI          No    Yes NA
## 60      Won   ODI         Yes    Yes NA
## 61      Won   ODI         Yes    Yes NA
## 62      Won   ODI         Yes    Yes NA
## 63      Won   ODI         Yes    Yes NA
## 64     Tied   ODI         Yes    Yes NA
## 65     Lost   ODI          No    Yes NA
## 66      Won   ODI         Yes    Yes NA
## 67      Won   ODI         Yes    Yes NA
## 68     Lost   ODI          No    Yes NA
## 69      Won   ODI         Yes    Yes NA
## 70      Won   ODI         Yes    Yes NA
## 71      Won  T20I         Yes     No NA
```

summary(data)

```
##      Score        Out.Not.Out          Against           Batting.Order
##  Min.   :100.0   Length:71          Length:71          Min.   :1.000
##  1st Qu.:107.0   Class :character   Class :character   1st Qu.:3.000
##  Median :119.0   Mode  :character   Mode  :character   Median :3.000
##  Mean   :132.1                                         Mean   :3.521
##  3rd Qu.:139.5                                         3rd Qu.:4.000
##  Max.   :254.0                                         Max.   :6.000
##
##       Inn.         Strike.Rate        Venue              Column1
##  Min.   :1.000   Min.   : 84.90   Length:71          Length:71
##  1st Qu.:1.000   1st Qu.: 96.63   Class :character   Class :character
##  Median :2.000   Median :108.94   Mode  :character   Mode  :character
##  Mean   :1.732   Mean   :114.02
##  3rd Qu.:2.000   3rd Qu.:120.79
##  Max.   :4.000   Max.   :200.00
##                  NA's   :27
##      H.A               Date              Result             Format
##  Length:71          Length:71          Length:71          Length:71
##  Class :character   Class :character   Class :character   Class :character
##  Mode  :character   Mode  :character   Mode  :character   Mode  :character
##
##
##
##
##  Man.of.the.Match    Captain               X
##  Length:71          Length:71          Mode:logical
##  Class :character   Class :character   NA's:71
##  Mode  :character   Mode  :character
##
##
##
##
```

mean(data**$**Inn.)

```
## [1] 1.732394
```

```r
median(data$Score)
```

```
## [1] 119
```

```r
options(repos = c(CRAN = "https://cloud.r-project.org"))
install.packages("modeest")
```

```
## Installing package into 'C:/Users/ASUS/AppData/Local/R/win-library/4.3'
## (as 'lib' is unspecified)
```

```
## package 'modeest' successfully unpacked and MD5 sums checked
##
## The downloaded binary packages are in
##   C:\Users\ASUS\AppData\Local\Temp\RtmpkzbBAS\downloaded_packages
```

```r
library(modeest)
mlv(data$Inn.)
```

```
## [1] 2
```

```r
sum(data$Batting.Order)
```

```
## [1] 250
```

```r
sd(data$Batting.Order)
```

```
## [1] 0.714326
```

```r
var(data$Batting.Order)
```

```
## [1] 0.5102616
```

```r
max(data$Score)
```

```
## [1] 254
```

```r
min(data$Score)
```

```
## [1] 100
```

```r
str(data$Score)
```

```
##  int [1:71] 116 103 103 107 119 105 115 141 169 147 ...
```

```
table(data$Column1)
```

```
##
##         Adelaide       Bangalore      Birmingham        Canberra       Cape Town
##                5               1               1               1               1
##           Cardiff       Centurion         Chennai         Colombo           Delhi
##                1               2               2               3               2
##            Dhaka      Dharamshala          Durban        Fatullah           Galle
##                4               1               1               1               2
##         Guwahati       Hambantota          Harare          Hobart       Hyderabad
##                2               1               1               1               1
##            Indore          Jaipur    Johannesburg          Kanpur        Kingston
##                1               1               1               1               1
##          Kolkata       Melbourne          Mohali          Mumbai          Nagpur
##                3               2               1               2               4
##           Napier      North Sound      Nottingham           Perth   Port of Spain
##                1               1               1               1               3
##             Pune          Rajkot          Ranchi          Sydney   Visakhapatnam
##                3               1               2               1               4
##        Wellington           Dubai
##                1               1
```

```
str(data)
```

```
## 'data.frame':    71 obs. of  15 variables:
##  $ Score          : int  116 103 103 107 119 105 115 141 169 147 ...
##  $ Out.Not.Out    : chr  "Out" "Out" "Out" "Out" ...
##  $ Against        : chr  "Australia" "New Zealand" "England" "Australia" ...
##  $ Batting.Order  : int  6 5 5 5 4 4 4 4 4 4 ...
##  $ Inn.           : int  2 2 2 2 1 4 2 4 2 2 ...
##  $ Strike.Rate    : num  NA NA NA NA NA NA NA NA NA NA ...
##  $ Venue          : chr  "Adelaide Oval" "M. Chinnaswamy Stadium" "Vidarbha Cricket Association Sta
##  $ Column1        : chr  " Adelaide" " Bangalore" " Nagpur" " Chennai" ...
##  $ H.A            : chr  "Away" "Home" "Home" "Home" ...
##  $ Date           : chr  "24-01-2012" "31-08-2012" "13-12-2012" "22-02-2013" ...
##  $ Result         : chr  "Lost" "Won" "Drawn" "Won" ...
##  $ Format         : chr  "Test" "Test" "Test" "Test" ...
##  $ Man.of.the.Match: chr  "No" "Yes" "No" "No" ...
##  $ Captain        : chr  "No" "No" "No" "No" ...
##  $ X              : logi  NA NA NA NA NA NA ...
```

#Transforming the variables

```
log(data$Score)
```

```
##  [1] 4.753590 4.634729 4.634729 4.672829 4.779123 4.653960 4.744932 4.948760
##  [9] 5.129899 4.990433 4.634729 5.298317 5.351858 5.117994 5.459586 5.318120
## [17] 4.634729 4.644391 5.361292 5.493061 5.030438 5.003946 4.634729 4.934474
## [25] 4.812184 5.537334 4.912655 4.672829 4.624973 4.770685 4.653960 4.605170
```
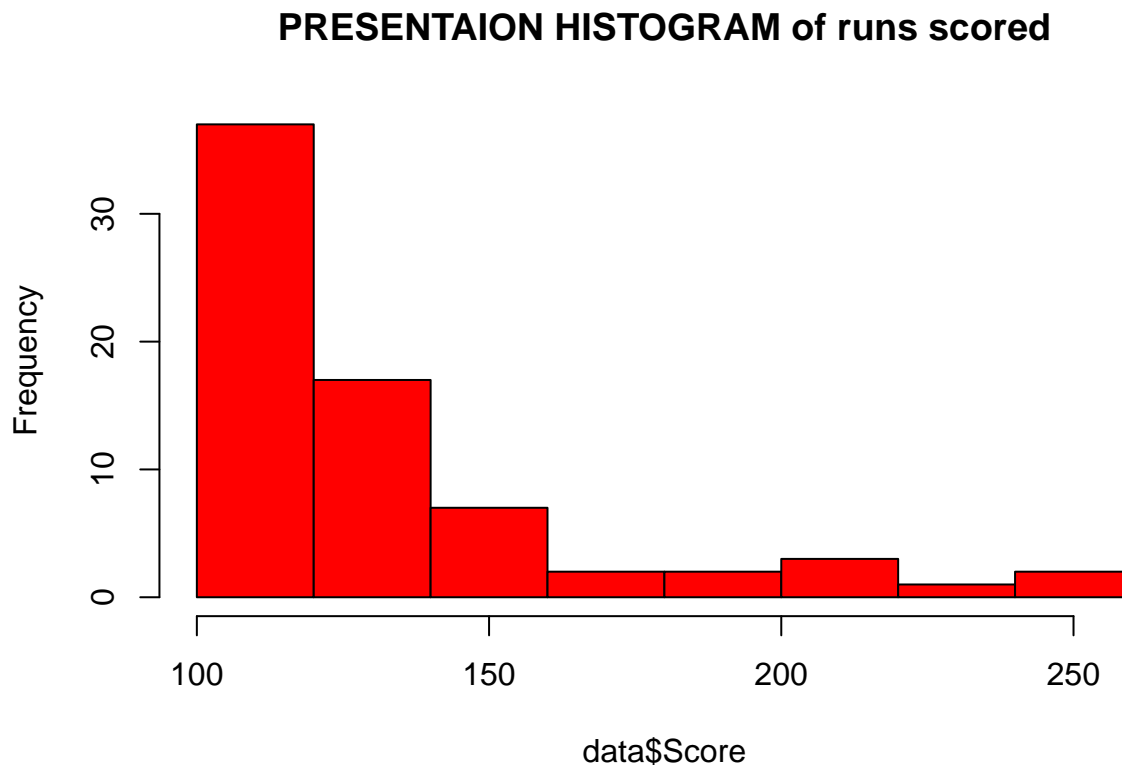
```
## [33]  4.672829 4.718499 4.762174 4.890349 4.682131 5.209486 4.663439 4.852030
## [41]  4.624973 4.744932 4.605170 4.744932 4.812184 4.912655 4.844187 4.934474
## [49]  4.672829 4.927254 4.762174 4.663439 5.036953 4.804021 4.709530 4.875197
## [57]  4.700480 4.795791 4.727388 4.718499 5.075174 4.859812 4.941642 5.056246
## [65]  4.672829 4.644391 4.753590 4.812184 4.787492 4.736198 4.804021
```

```
data3 <- data$Batting.Order- mean(data$Inn.)
data3
```

```
##  [1]  4.2676056  3.2676056  3.2676056  3.2676056  2.2676056  2.2676056
##  [7]  2.2676056  2.2676056  2.2676056  2.2676056  2.2676056  2.2676056
## [13]  2.2676056  2.2676056  2.2676056  2.2676056  2.2676056  2.2676056
## [19]  2.2676056  2.2676056  2.2676056  2.2676056  2.2676056  2.2676056
## [25]  2.2676056  2.2676056  2.2676056  2.2676056  1.2676056  1.2676056
## [31]  1.2676056  2.2676056  2.2676056  2.2676056  2.2676056  2.2676056
## [37]  1.2676056  1.2676056  1.2676056  1.2676056  1.2676056  1.2676056
## [43]  1.2676056  1.2676056  1.2676056  1.2676056  1.2676056  2.2676056
## [49]  1.2676056  1.2676056  1.2676056  1.2676056  1.2676056  1.2676056
## [55]  1.2676056  1.2676056  1.2676056  1.2676056  1.2676056  1.2676056
## [61]  1.2676056  1.2676056  1.2676056  1.2676056  1.2676056  1.2676056
## [67]  1.2676056  1.2676056  1.2676056  1.2676056 -0.7323944
```

#plotting the variable

```
hist(data$Score,col= "red",main = "PRESENTAION HISTOGRAM of runs scored")
```

PRESENTAION HISTOGRAM of runs scored

```
plot(data$Score,data$Inn.,main = "Plot", col="blue")
```

Plot