A Dean's Dilemma: Selection of Students for the MBA Program

Read the data

```
mba <- read.csv(paste("Data - Deans Dilemma.csv", sep=""))
View(mba)
```

Attach the dataframe

```
attach(mba)
```

Summarize the data

```
summary(mba)
```

```
##       SlNo       Gender     Gender.B       Percent_SSC     Board_SSC
##  Min.   :  1.0   F:127   Min.   :0.0000   Min.   :37.00   CBSE  :113
##  1st Qu.: 98.5   M:264   1st Qu.:0.0000   1st Qu.:56.00   ICSE  : 77
##  Median :196.0           Median :0.0000   Median :64.50   Others:201
##  Mean   :196.0           Mean   :0.3248   Mean   :64.65
##  3rd Qu.:293.5           3rd Qu.:1.0000   3rd Qu.:74.00
##  Max.   :391.0           Max.   :1.0000   Max.   :87.20
##
##    Board_CBSE      Board_ICSE      Percent_HSC    Board_HSC
##  Min.   :0.000   Min.   :0.0000   Min.   :40.0   CBSE  : 96
##  1st Qu.:0.000   1st Qu.:0.0000   1st Qu.:54.0   ISC   : 48
##  Median :0.000   Median :0.0000   Median :63.0   Others:247
##  Mean   :0.289   Mean   :0.1969   Mean   :63.8
##  3rd Qu.:1.000   3rd Qu.:0.0000   3rd Qu.:72.0
##  Max.   :1.000   Max.   :1.0000   Max.   :94.7
##
##     Stream_HSC  Percent_Degree                Course_Degree
##  Arts    : 18   Min.   :35.00   Arts                  : 13
##  Commerce:222   1st Qu.:57.52   Commerce              :117
##  Science :151   Median :63.00   Computer Applications: 32
##                 Mean   :62.98   Engineering           : 37
##                 3rd Qu.:69.00   Management            :163
##                 Max.   :89.00   Others                :  5
##                                 Science               : 24
##   Degree_Engg      Experience_Yrs   Entrance_Test     S.TEST
##  Min.   :0.00000   Min.   :0.0000   MAT    :265   Min.   :0.0000
##  1st Qu.:0.00000   1st Qu.:0.0000   None   : 67   1st Qu.:1.0000
##  Median :0.00000   Median :0.0000   K-MAT  : 24   Median :1.0000
##  Mean   :0.09463   Mean   :0.4783   CAT    : 22   Mean   :0.8286
##  3rd Qu.:0.00000   3rd Qu.:1.0000   PGCET  :  8   3rd Qu.:1.0000
##  Max.   :1.00000   Max.   :3.0000   GCET   :  2   Max.   :1.0000
##                                     (Other):  3
##  Percentile_ET    S.TEST.SCORE    Percent_MBA
##  Min.   : 0.00   Min.   : 0.00   Min.   :50.83
##  1st Qu.:41.19   1st Qu.:41.19   1st Qu.:57.20
```

```
##  Median :62.00   Median :62.00   Median :61.01
##  Mean   :54.93   Mean   :54.93   Mean   :61.67
##  3rd Qu.:78.00   3rd Qu.:78.00   3rd Qu.:66.02
##  Max.   :98.69   Max.   :98.69   Max.   :77.89
##
##           Specialization_MBA Marks_Communication Marks_Projectwork
##  Marketing & Finance:222      Min.   :50.00       Min.   :50.00
##  Marketing & HR     :156      1st Qu.:53.00       1st Qu.:64.00
##  Marketing & IB     : 13      Median :58.00       Median :69.00
##                               Mean   :60.54       Mean   :68.36
##                               3rd Qu.:67.00       3rd Qu.:74.00
##                               Max.   :88.00       Max.   :87.00
##
##    Marks_BOCA         Placement    Placement_B        Salary
##  Min.   :50.00   Not Placed: 79   Min.   :0.000   Min.   :     0
##  1st Qu.:57.00   Placed    :312   1st Qu.:1.000   1st Qu.:172800
##  Median :63.00                    Median :1.000   Median :240000
##  Mean   :64.38                    Mean   :0.798   Mean   :219078
##  3rd Qu.:72.50                    3rd Qu.:1.000   3rd Qu.:300000
##  Max.   :96.00                    Max.   :1.000   Max.   :940000
##
```

```
library(psych)
describe(mba)
```

```
##                      vars   n      mean        sd    median   trimmed
## SlNo                    1 391    196.00    113.02    196.00    196.00
## Gender*                 2 391      1.68      0.47      2.00      1.72
## Gender.B                3 391      0.32      0.47      0.00      0.28
## Percent_SSC             4 391     64.65     10.96     64.50     64.76
## Board_SSC*              5 391      2.23      0.87      3.00      2.28
## Board_CBSE              6 391      0.29      0.45      0.00      0.24
## Board_ICSE              7 391      0.20      0.40      0.00      0.12
## Percent_HSC             8 391     63.80     11.42     63.00     63.34
## Board_HSC*              9 391      2.39      0.85      3.00      2.48
## Stream_HSC*            10 391      2.34      0.56      2.00      2.36
## Percent_Degree         11 391     62.98      8.92     63.00     62.91
## Course_Degree*         12 391      3.85      1.61      4.00      3.81
## Degree_Engg            13 391      0.09      0.29      0.00      0.00
## Experience_Yrs         14 391      0.48      0.67      0.00      0.36
## Entrance_Test*         15 391      5.85      1.35      6.00      6.08
## S.TEST                 16 391      0.83      0.38      1.00      0.91
## Percentile_ET          17 391     54.93     31.17     62.00     56.87
## S.TEST.SCORE           18 391     54.93     31.17     62.00     56.87
## Percent_MBA            19 391     61.67      5.85     61.01     61.45
## Specialization_MBA*    20 391      1.47      0.56      1.00      1.42
## Marks_Communication    21 391     60.54      8.82     58.00     59.68
## Marks_Projectwork      22 391     68.36      7.15     69.00     68.60
## Marks_BOCA             23 391     64.38      9.58     63.00     64.08
## Placement*             24 391      1.80      0.40      2.00      1.87
```

```
## Placement_B           25 391      0.80      0.40      1.00      0.87
## Salary                26 391 219078.26 138311.65 240000.00 217011.50
##                          mad   min       max     range  skew kurtosis
## SlNo                  145.29  1.00    391.00    390.00  0.00    -1.21
## Gender*                 0.00  1.00      2.00      1.00 -0.75    -1.45
## Gender.B                0.00  0.00      1.00      1.00  0.75    -1.45
## Percent_SSC            12.60 37.00     87.20     50.20 -0.06    -0.72
## Board_SSC*              0.00  1.00      3.00      2.00 -0.45    -1.53
## Board_CBSE              0.00  0.00      1.00      1.00  0.93    -1.14
## Board_ICSE              0.00  0.00      1.00      1.00  1.52     0.31
## Percent_HSC            13.34 40.00     94.70     54.70  0.29    -0.67
## Board_HSC*              0.00  1.00      3.00      2.00 -0.83    -1.13
## Stream_HSC*             0.00  1.00      3.00      2.00 -0.12    -0.72
## Percent_Degree          8.90 35.00     89.00     54.00  0.05     0.24
## Course_Degree*          1.48  1.00      7.00      6.00  0.00    -1.08
## Degree_Engg             0.00  0.00      1.00      1.00  2.76     5.63
## Experience_Yrs          0.00  0.00      3.00      3.00  1.27     1.17
## Entrance_Test*          0.00  1.00      9.00      8.00 -2.52     7.04
## S.TEST                  0.00  0.00      1.00      1.00 -1.74     1.02
## Percentile_ET          25.20  0.00     98.69     98.69 -0.74    -0.69
## S.TEST.SCORE           25.20  0.00     98.69     98.69 -0.74    -0.69
## Percent_MBA             6.39 50.83     77.89     27.06  0.34    -0.52
## Specialization_MBA*     0.00  1.00      3.00      2.00  0.70    -0.56
## Marks_Communication     8.90 50.00     88.00     38.00  0.74    -0.25
## Marks_Projectwork       7.41 50.00     87.00     37.00 -0.26    -0.27
## Marks_BOCA             11.86 50.00     96.00     46.00  0.29    -0.85
## Placement*              0.00  1.00      2.00      1.00 -1.48     0.19
## Placement_B             0.00  0.00      1.00      1.00 -1.48     0.19
## Salary              88956.00  0.00 940000.00 940000.00  0.24     1.74
##                           se
## SlNo                    5.72
## Gender*                 0.02
## Gender.B                0.02
## Percent_SSC             0.55
## Board_SSC*              0.04
## Board_CBSE              0.02
## Board_ICSE              0.02
## Percent_HSC             0.58
## Board_HSC*              0.04
## Stream_HSC*             0.03
## Percent_Degree          0.45
## Course_Degree*          0.08
## Degree_Engg             0.01
## Experience_Yrs          0.03
## Entrance_Test*          0.07
## S.TEST                  0.02
## Percentile_ET           1.58
## S.TEST.SCORE            1.58
## Percent_MBA             0.30
## Specialization_MBA*     0.03
```

```
## Marks_Communication    0.45
## Marks_Projectwork      0.36
## Marks_BOCA             0.48
## Placement*             0.02
## Placement_B            0.02
## Salary              6994.72
```

Q1. What is the median salary of all the students?

```
median(mba$Salary)
```

```
## [1] 240000
```

Q2. What percentage of students were placed? Answer rounding off to 2 decimal places.

```
summary(mba$Placement)
```

```
## Not Placed     Placed
##         79        312
```

```
100*mean(mba$Placement_B)
```

```
## [1] 79.7954
```

Q3. Create a dataframe called "placed" having the subset of students who were placed

```
placed <- mba[ which(mba$Placement=='Placed') , ]
View(placed)
```

Q4. What is the median salary of students who were placed, excluding those who were not placed?

Method 1:

```
median (mba$Salary[mba$Salary > 0] )
```

```
## [1] 260000
```

```
### Method 2:
median(placed$Salary)
```

```
## [1] 260000
```

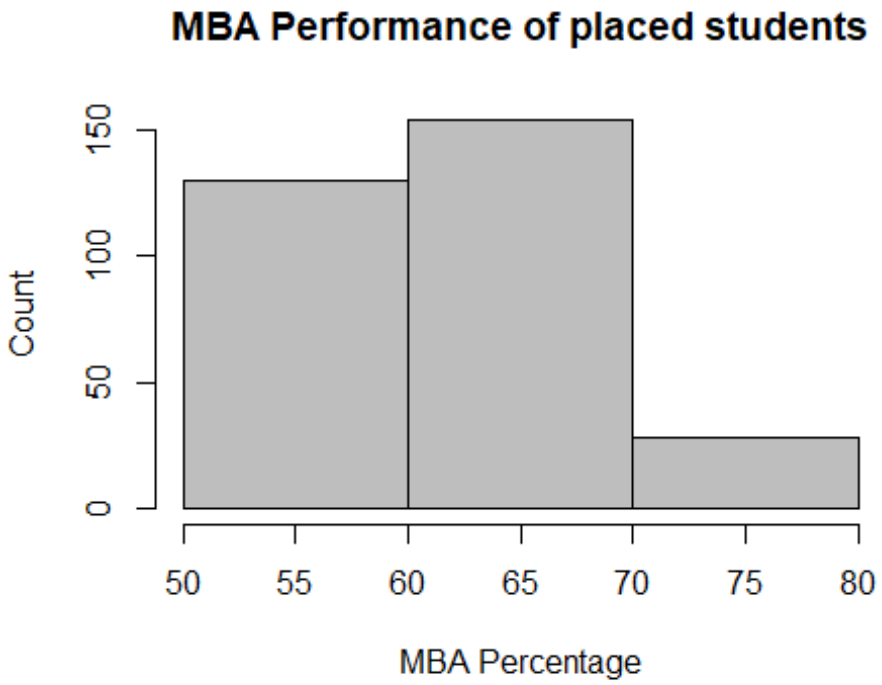
Q5. Considering placed students, create a table giving the mean salary of males and females?

Method 1: Using aggregate()

```
aggregate(placed$Salary, by=list(Sex = placed$Gender), mean)

##   Sex        x
## 1   F 253068.0
## 2   M 284241.9

### Method 2: Using by()
by(placed$Salary, placed$Gender, mean)

## placed$Gender: F
## [1] 253068
## ------------------------------------------------------------
## placed$Gender: M
## [1] 284241.9
```

Q6. Create a histogram showing a breakup of the MBA performance of the students who were placed

```
hist(placed$Percent_MBA,
     main="MBA Performance of placed students",
     xlab="MBA Percentage",
     ylab="Count",
     breaks=2,        # more columns
     col="grey")       # color the bars
```

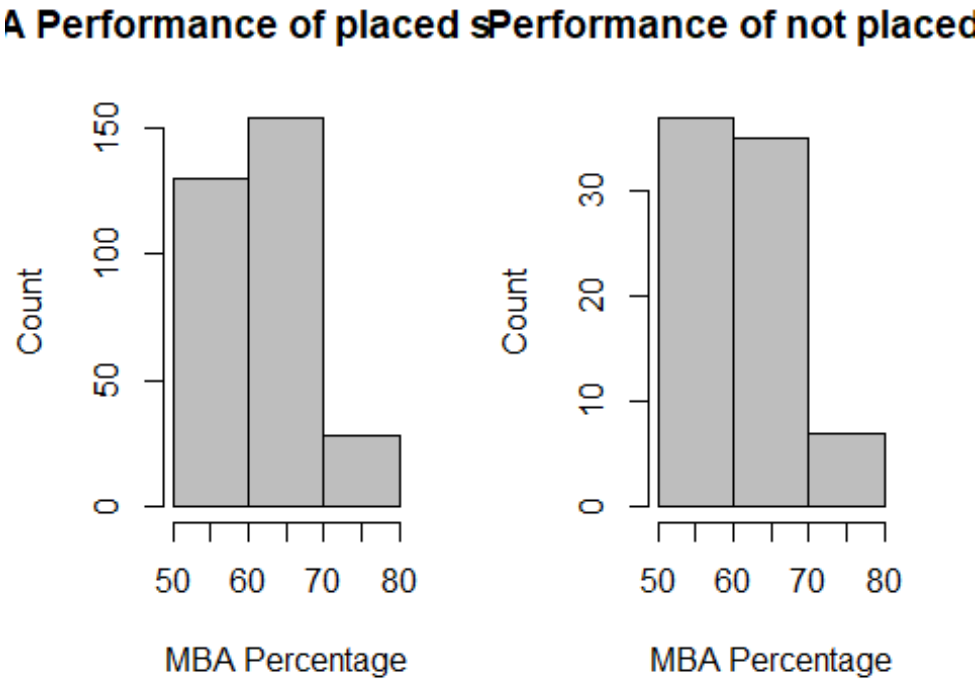


Q7. Create a dataframe called notplaced, containing only those students who were not placed.

```
notplaced <- mba[ which(mba$Placement=='Not Placed') , ]
View(notplaced)
```

Q8. Draw two histograms side-by-side, showing the MBA performance of Placed and Not Placed students

```
par(mfrow=c(1, 2))
hist(placed$Percent_MBA,
     main="MBA Performance of placed students",
     xlab="MBA Percentage",
     ylab="Count",
     breaks=2,         # more columns
     col="grey")       # color the bars
hist(notplaced$Percent_MBA,
     main="MBA Performance of not placed students",
     xlab="MBA Percentage",
     ylab="Count",
     breaks=2,         # more columns
     col="grey")       # color the bars
```




```
par(mfrow=c(1, 1))
```

Q9. Draw two boxplots, one below the other, comparing the salaries of males and female MBAs who were placed

```
boxplot(placed$Salary ~ placed$Gender, data=placed, horizontal=TRUE, yaxt="n"
,
        ylab="Gender", xlab="Salary",
        main="Comparison of Salaries of Males and Females")
axis(side=2, at=c(1,2), labels=c("Females", "Males"))
```

Q10. Create a dataframe called placedET, representing students who were placed

after the MBA and who also gave some MBA entrance test

before admission into the MBA program.

Method 1:

```
placedET <- placed[ which(placed$S.TEST==1) , ]
#### Method 2:
placedET <- placed[ which(placed$Entrance_Test != "None") , ]
View(placedET)
```

Q11. Draw a Scatter Plot Matrix for 3 variables

{Salary, Percent_MBA, Experience_Yrs} using placedET.

```
library(car)

##
## Attaching package: 'car'

## The following object is masked from 'package:psych':
##
##     logit

scatterplotMatrix(
  placedET[
    ,c("Salary","Percent_MBA","Percentile_ET")],
  spread=FALSE, smoother.args=list(lty=2),
  main="Scatter Plot Matrix")
```