hw2ExploreTESDataSet

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Discription of the name of the columns

`age` represent the age of the employee, `gender` represent the gender of the employee,1 Male 2 Female `satisfaction` represent the employee's satisfaction of the job, `jobCharacteristicsVTM` represent the most important characteristics of the job, `YoW` represent the years altogether you've worked for your present employer `likenessOfPromotionInF` represent the employee's feeling of are they to be promoted' `decisionAffectYourOwn` represent the involvedness of the employee making decision affecting their own job, `paticipationOfBudgetaryDecision` represent do the employee participate in budgetary decisions? `proudness` shows the employees proud of their job or not, `lessMoneyToStay` represent how likely the employee willing to turn down another higher salary job to stay in the organization, `relationshipBtwColleague` represent the personal feeling of the between the colleagues.

Exploring Start

```
myTesDF<-read.csv("C:\\Users\\whylo\\Desktop\\MITA_Third_Year\\Business Forecasting\\Homeworks\\hw2\\Ty
```

Reading in csv file.

```
names(myTesDF)
```

Showing the information of the data

```
##  [1] "age"                          "gender"
##  [3] "satisfaction"                 "jobCharacteristicsVTM"
##  [5] "YoW"                          "likenessOfPromotionInF"
##  [7] "decisionAffectYourOwn"        "paticipationOfBudgetaryDecision"
##  [9] "proudness"                    "lessMoneyToStay"
## [11] "relationshipBtwColleague"
```

```
ncol(myTesDF)
```

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

```
nrow(myTesDF)
```

```
## [1] 122
```

```
dim(myTesDF)
```

```
## [1] 122  11
```

```
head(myTesDF)
```

```
##   age gender satisfaction jobCharacteristicsVTM  YoW likenessOfPromotionInF
## 1  35      1            2                     4  3.0                      1
```

```
## 2  33      1            2                     3  9.0                     5
## 3  23      1            1                     1  1.5                     1
## 4  60      1            1                     1 20.0                     3
## 5  35      1            2                     1  3.0                     3
## 6  34      2            2                     1  6.0                     1
##   decisionAffectYourOwn paticipationOfBudgetaryDecision proudness
## 1                     2                               1         2
## 2                     2                               1         2
## 3                     2                               2         1
## 4                     2                               2         1
## 5                     2                               1         2
## 6                     2                               2         2
##   lessMoneyToStay relationshipBtwColleague
## 1               5                       2
## 2               2                       1
## 3               5                       2
## 4               1                       1
## 5               4                       2
## 6               4                       4
```

```
str(myTesDF)
```

Brief of the DF before fatorization

```
## 'data.frame':    122 obs. of  11 variables:
##  $ age                           : int  35 33 23 60 35 34 61 59 37 30 ...
##  $ gender                        : int  1 1 1 1 1 2 2 1 2 1 ...
##  $ satisfaction                  : int  2 2 1 1 2 2 1 2 1 1 ...
##  $ jobCharacteristicsVTM         : int  4 3 1 1 1 1 1 5 5 5 ...
##  $ YoW                           : num  3 9 1.5 20 3 6 0.75 1.5 3 5 ...
##  $ likenessOfPromotionInF        : int  1 5 1 3 3 1 5 2 4 2 ...
##  $ decisionAffectYourOwn         : int  2 2 2 2 2 2 3 1 3 2 ...
##  $ paticipationOfBudgetaryDecision: int  1 1 2 2 1 2 2 2 1 1 ...
##  $ proudness                     : int  2 2 1 1 2 2 2 2 2 1 ...
##  $ lessMoneyToStay               : int  5 2 5 1 4 4 4 4 2 2 ...
##  $ relationshipBtwColleague      : int  2 1 2 1 2 4 1 1 3 2 ...
```

```
myTesDF$gender<-as.factor(myTesDF$gender)
myTesDF$satisfaction<-as.factor(myTesDF$satisfaction)
myTesDF$jobCharacteristicsVTM<-as.factor(myTesDF$jobCharacteristicsVTM)
myTesDF$likenessOfPromotionInF<-as.factor(myTesDF$likenessOfPromotionInF)
myTesDF$decisionAffectYourOwn<-as.factor(myTesDF$decisionAffectYourOwn)
myTesDF$paticipationOfBudgetaryDecision<-as.factor(myTesDF$paticipationOfBudgetaryDecision)
myTesDF$proudness<-as.factor(myTesDF$proudness)
myTesDF$lessMoneyToStay<-as.factor(myTesDF$lessMoneyToStay)
myTesDF$relationshipBtwColleague<-as.factor(myTesDF$relationshipBtwColleague)

str(myTesDF)
```

Brief of the DF after fatorization

```
## 'data.frame':    122 obs. of  11 variables:
##  $ age                           : int  35 33 23 60 35 34 61 59 37 30 ...
```

```
##  $ gender                         : Factor w/ 2 levels "1","2": 1 1 1 1 1 2 2 1 2 1 ...
##  $ satisfaction                   : Factor w/ 4 levels "1","2","3","4": 2 2 1 1 2 2 1 2 1 1 ...
##  $ jobCharacteristicsVTM          : Factor w/ 5 levels "1","2","3","4",..: 4 3 1 1 1 1 1 5 5 5 ...
##  $ YoW                            : num  3 9 1.5 20 3 6 0.75 1.5 3 5 ...
##  $ likenessOfPromotionInF         : Factor w/ 5 levels "1","2","3","4",..: 1 5 1 3 3 1 5 2 4 2 ...
##  $ decisionAffectYourOwn          : Factor w/ 4 levels "1","2","3","4": 2 2 2 2 2 2 3 1 3 2 ...
##  $ paticipationOfBudgetaryDecision: Factor w/ 2 levels "1","2": 1 1 2 2 1 2 2 2 1 1 ...
##  $ proudness                      : Factor w/ 4 levels "1","2","3","4": 2 2 1 1 2 2 2 2 2 1 ...
##  $ lessMoneyToStay                : Factor w/ 5 levels "1","2","3","4",..: 5 2 5 1 4 4 4 4 2 2 ...
##  $ relationshipBtwColleague       : Factor w/ 4 levels "1","2","3","4": 2 1 2 1 2 4 1 1 3 2 ...
```

```
summary(myTesDF)
```

Showing summary of the DF

```
##       age       gender satisfaction jobCharacteristicsVTM      YoW
##  Min.   :20.0   1:70   1:65         1:26                  Min.   : 0.080
##  1st Qu.:33.0   2:52   2:44         2: 8                  1st Qu.: 2.000
##  Median :38.0          3: 6         3: 6                  Median : 5.000
##  Mean   :39.1          4: 7         4:18                  Mean   : 8.224
##  3rd Qu.:44.0                       5:64                  3rd Qu.:11.000
##  Max.   :64.0                                             Max.   :52.250
##  likenessOfPromotionInF decisionAffectYourOwn paticipationOfBudgetaryDecision
##  1:21                    1:17                 1:67
##  2:28                    2:57                 2:55
##  3: 6                    3:45
##  4:29                    4: 3
##  5:38
##
##  proudness lessMoneyToStay relationshipBtwColleague
##  1:37      1:16            1:51
##  2:75      2:30            2:49
##  3: 9      3: 1            3:19
##  4: 1      4:57            4: 3
##            5:18
##
```

```
#columns 1 to 3
myTesDF[1:3]
```

Displaying part of the DF by columns and rows

```
##     age gender satisfaction
## 1    35      1            2
## 2    33      1            2
## 3    23      1            1
## 4    60      1            1
## 5    35      1            2
## 6    34      2            2
## 7    61      2            1
## 8    59      1            2
## 9    37      2            1
## 10   30      1            1
```

```
## 11   34      2            1
## 12   34      2            2
## 13   27      2            2
## 14   38      1            1
## 15   41      1            3
## 16   58      1            2
## 17   34      2            2
## 18   48      2            2
## 19   26      2            1
## 20   39      1            1
## 21   29      2            1
## 22   36      1            4
## 23   25      1            1
## 24   39      2            2
## 25   40      1            2
## 26   53      1            2
## 27   39      2            1
## 28   27      2            4
## 29   35      1            1
## 30   25      1            1
## 31   29      1            2
## 32   23      2            1
## 33   40      1            1
## 34   36      2            3
## 35   64      2            1
## 36   43      2            1
## 37   28      2            2
## 38   48      2            1
## 39   52      1            3
## 40   32      1            2
## 41   23      1            2
## 42   44      2            1
## 43   36      2            4
## 44   33      2            2
## 45   52      1            1
## 46   38      1            1
## 47   34      1            1
## 48   62      1            1
## 49   36      2            4
## 50   37      1            2
## 51   39      2            2
## 52   61      2            1
## 53   20      1            2
## 54   22      1            2
## 55   36      1            1
## 56   48      2            1
## 57   58      2            1
## 58   50      1            3
## 59   24      1            2
## 60   44      2            1
## 61   30      2            4
## 62   32      1            2
## 63   32      1            2
## 64   44      1            1
```

```
## 65   34       1             1
## 66   42       2             2
## 67   40       1             1
## 68   37       1             1
## 69   32       2             2
## 70   31       2             1
## 71   44       1             1
## 72   39       1             1
## 73   30       1             2
## 74   41       1             2
## 75   39       1             3
## 76   33       1             2
## 77   25       1             2
## 78   31       2             1
## 79   41       2             1
## 80   42       1             1
## 81   33       2             2
## 82   36       2             1
## 83   39       1             2
## 84   39       1             1
## 85   62       1             1
## 86   62       1             1
## 87   34       1             1
## 88   52       1             1
## 89   40       1             3
## 90   43       2             2
## 91   41       2             2
## 92   64       1             1
## 93   26       1             1
## 94   45       1             2
## 95   33       1             2
## 96   36       1             1
## 97   45       2             2
## 98   51       2             1
## 99   38       2             1
## 100  57       1             1
## 101  45       2             1
## 102  43       1             1
## 103  37       1             1
## 104  33       2             1
## 105  51       2             2
## 106  43       2             4
## 107  42       2             1
## 108  25       1             1
## 109  40       1             1
## 110  57       2             2
## 111  38       1             1
## 112  41       2             4
## 113  32       1             1
## 114  39       1             1
## 115  43       1             2
## 116  50       2             1
## 117  49       1             2
## 118  35       2             2
```

```
## 119  22      1            1
## 120  33      2            1
## 121  29      2            1
## 122  22      1            2
```

```
#rows No.4
myTesDF[4,]
```

```
##   age gender satisfaction jobCharacteristicsVTM YoW likenessOfPromotionInF
## 4  60      1            1                     1  20                      3
##   decisionAffectYourOwn paticipationOfBudgetaryDecision proudness
## 4                     2                               2         1
##   lessMoneyToStay relationshipBtwColleague
## 4               1                       1
```

```
#combined
myTesDF[2:11,c("age","gender","YoW","proudness")]
```

```
##    age gender   YoW proudness
## 2   33      1  9.00         2
## 3   23      1  1.50         1
## 4   60      1 20.00         1
## 5   35      1  3.00         2
## 6   34      2  6.00         2
## 7   61      2  0.75         2
## 8   59      1  1.50         2
## 9   37      2  3.00         2
## 10  30      1  5.00         1
## 11  34      2  3.00         1
```

```
myTesDF[3:8,3:5]
```

```
##   satisfaction jobCharacteristicsVTM   YoW
## 3            1                     1  1.50
## 4            1                     1 20.00
## 5            2                     1  3.00
## 6            2                     1  6.00
## 7            1                     1  0.75
## 8            2                     5  1.50
```

```
table(myTesDF$jobCharacteristicsVTM)
```

Levels

```
##
##  1  2  3  4  5
## 26  8  6 18 64
```

```
#multiple  filtering
tesDF_subesetOfMaleandJCVTMInRange<-subset(myTesDF,gender == 1 & (jobCharacteristicsVTM==3 | jobCharacte
tesDF_subesetOfMaleandJCVTMInRange
```

Filtering

```
##    age gender satisfaction jobCharacteristicsVTM   YoW likenessOfPromotionInF
## 1   35      1            2                     4  3.00                      1
```

```
## 2    33      1            2                    3  9.00                    5
## 14   38      1            1                    4 15.00                    1
## 16   58      1            2                    4 36.00                    5
## 23   25      1            1                    4  2.00                    1
## 53   20      1            2                    4  3.00                    2
## 64   44      1            1                    4 22.00                    2
## 71   44      1            1                    4  0.66                    5
## 74   41      1            2                    4 12.00                    3
## 75   39      1            3                    4  9.00                    4
## 77   25      1            2                    4  3.00                    5
## 83   39      1            2                    4 16.00                    2
## 87   34      1            1                    4  2.08                    2
## 93   26      1            1                    4  1.50                    1
## 96   36      1            1                    3  5.00                    5
## 115  43      1            2                    3  5.00                    4
## 117  49      1            2                    4  1.50                    5
##     decisionAffectYourOwn paticipationOfBudgetaryDecision proudness
## 1                       2                               1         2
## 2                       2                               1         2
## 14                      2                               1         2
## 16                      2                               1         2
## 23                      3                               2         2
## 53                      3                               1         3
## 64                      2                               1         2
## 71                      3                               1         1
## 74                      3                               2         2
## 75                      3                               2         2
## 77                      1                               1         2
## 83                      2                               2         2
## 87                      3                               1         1
## 93                      1                               2         2
## 96                      3                               2         2
## 115                     2                               1         2
## 117                     4                               1         1
##     lessMoneyToStay relationshipBtwColleague
## 1                 5                        2
## 2                 2                        1
## 14                2                        1
## 16                5                        2
## 23                4                        2
## 53                2                        1
## 64                4                        1
## 71                5                        1
## 74                4                        1
## 75                5                        1
## 77                5                        2
## 83                4                        2
## 87                4                        1
## 93                4                        2
## 96                4                        1
## 115               4                        1
## 117               1                        1
```

```
#rev provides a reversed version of its argument. It is generic function with a default method for vect
#This providing the employee with the longest years of working for this org with the least satisfaction
partofDF<- myTesDF[order(myTesDF$YoW,rev(myTesDF$satisfaction),decreasing = TRUE),]
partofDF[1:24,1:5]
```

Ordering

```
##     age gender satisfaction jobCharacteristicsVTM   YoW
## 48   62      1            1                     1 52.25
## 16   58      1            2                     4 36.00
## 100  57      1            1                     1 34.00
## 88   52      1            1                     2 31.91
## 110  57      2            2                     5 29.25
## 92   64      1            1                     5 29.00
## 85   62      1            1                     2 27.00
## 102  43      1            1                     5 26.00
## 98   51      2            1                     5 24.00
## 105  51      2            2                     5 23.00
## 58   50      1            3                     5 22.50
## 64   44      1            1                     4 22.00
## 66   42      2            2                     5 22.00
## 97   45      2            2                     5 21.00
## 4    60      1            1                     1 20.00
## 50   37      1            2                     5 19.00
## 36   43      2            1                     5 18.00
## 83   39      1            2                     4 16.00
## 21   29      2            1                     5 16.00
## 14   38      1            1                     4 15.00
## 90   43      2            2                     5 14.00
## 52   61      2            1                     5 13.00
## 74   41      1            2                     4 12.00
## 57   58      2            1                     4 12.00
```

```
#satisfaction->happiness
names(myTesDF)[3] <- "hapiness"
head(myTesDF,3)
```

Chage name of the columns

```
##   age gender hapiness jobCharacteristicsVTM YoW likenessOfPromotionInF
## 1  35      1        2                     4 3.0                     1
## 2  33      1        2                     3 9.0                     5
## 3  23      1        1                     1 1.5                     1
##   decisionAffectYourOwn paticipationOfBudgetaryDecision proudness
## 1                     2                               1         2
## 2                     2                               1         2
## 3                     2                               2         1
##   lessMoneyToStay relationshipBtwColleague
## 1               5                       2
## 2               2                       1
## 3               5                       2
```

```
#happiness->satisfaction
names(myTesDF)[3] <- "satisfaction"
head(myTesDF,3)
```

```
##   age gender satisfaction jobCharacteristicsVTM YoW likenessOfPromotionInF
## 1  35      1            2                     4 3.0                      1
## 2  33      1            2                     3 9.0                      5
## 3  23      1            1                     1 1.5                      1
##   decisionAffectYourOwn paticipationOfBudgetaryDecision proudness
## 1                     2                               1         2
## 2                     2                               1         2
## 3                     2                               2         1
##   lessMoneyToStay relationshipBtwColleague
## 1               5                       2
## 2               2                       1
## 3               5                       2
```

Changing age data for row 33

```
myTesDF[33,1]
```

```
## [1] 40
```

```
#was 40
myTesDF[33,1] <- 22
myTesDF$age[33]
```

```
## [1] 22
```

```
#now 22
myTesDF$age[33] <- 40
myTesDF[33,1]
```

```
## [1] 40
```

```
#changing back to 40
```

```
library(magrittr)
library(dplyr)
```

Graphing

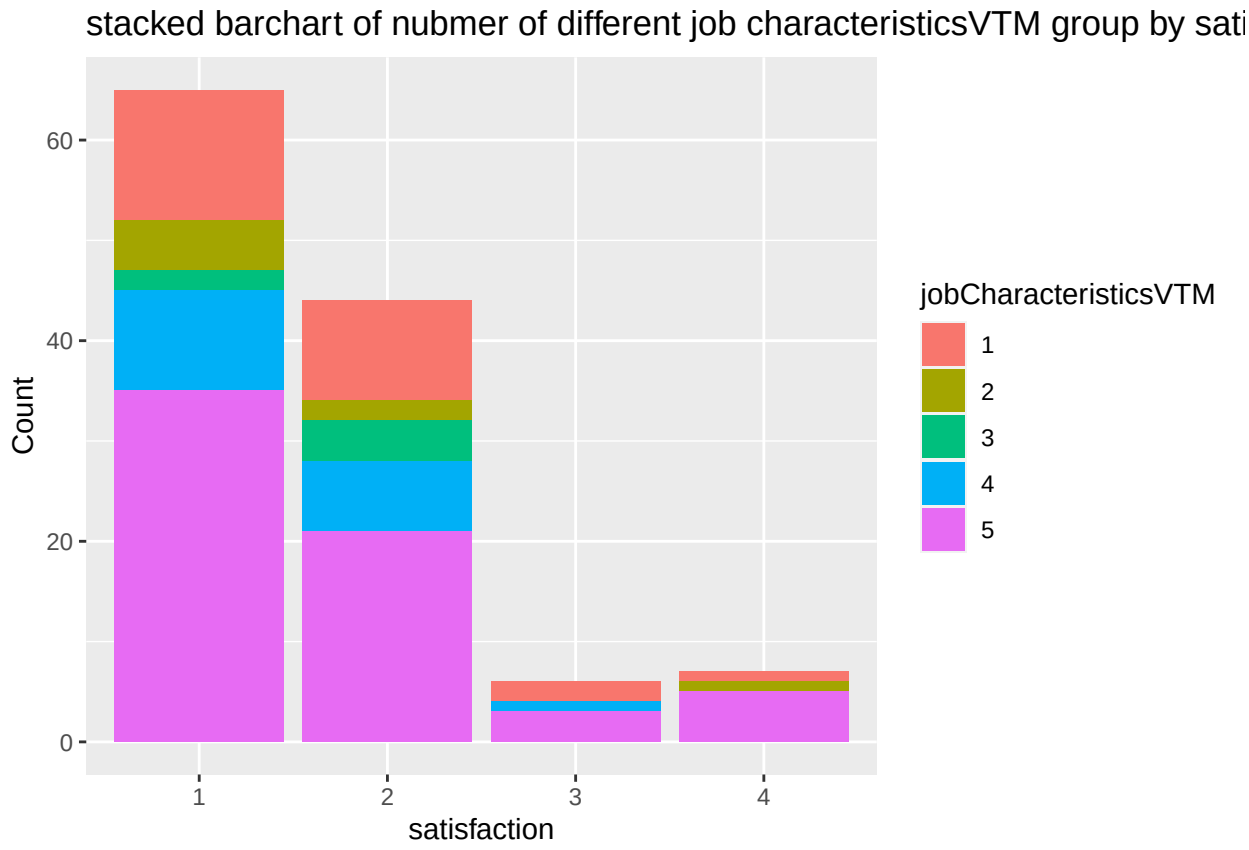
```
##
## Attaching package: 'dplyr'
```

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

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

```
library(ggplot2)
ggpStackedBarchart<-myTesDF %>% group_by(satisfaction,jobCharacteristicsVTM) %>% count(satisfaction) %>%
  ggplot(aes(x = satisfaction, y = n,fill=jobCharacteristicsVTM))+geom_text(aes(label=n)) +geom_bar(sta
```

```
ggpStackedBarchart<-ggpStackedBarchart+labs(y="Count",title="stacked barchart of nubmer of different jo
ggpStackedBarchart
```

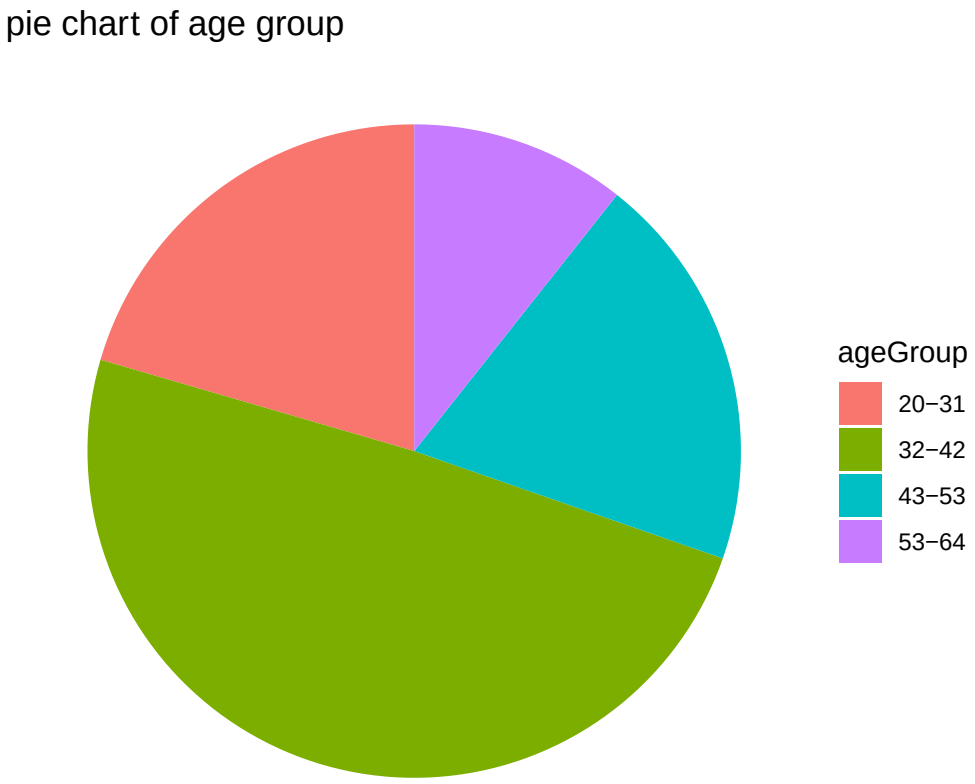



```
myTesDF2<-myTesDF
myTesDF2["ageGroup"] = cut(myTesDF2$age, c(20, 31, 42, 53, 64), c("20-31", "32-42", "43-53","53-64"), i
str(myTesDF2)
```

```
## 'data.frame':    122 obs. of  12 variables:
##  $ age                           : num  35 33 23 60 35 34 61 59 37 30 ...
##  $ gender                        : Factor w/ 2 levels "1","2": 1 1 1 1 1 2 2 1 2 1 ...
##  $ satisfaction                  : Factor w/ 4 levels "1","2","3","4": 2 2 1 1 2 2 1 2 1 1 ...
##  $ jobCharacteristicsVTM         : Factor w/ 5 levels "1","2","3","4",..: 4 3 1 1 1 1 1 5 5 5 ...
##  $ YoW                           : num  3 9 1.5 20 3 6 0.75 1.5 3 5 ...
##  $ likenessOfPromotionInF        : Factor w/ 5 levels "1","2","3","4",..: 1 5 1 3 3 1 5 2 4 2 ...
##  $ decisionAffectYourOwn         : Factor w/ 4 levels "1","2","3","4": 2 2 2 2 2 2 3 1 3 2 ...
##  $ paticipationOfBudgetaryDecision: Factor w/ 2 levels "1","2": 1 1 2 2 1 2 2 2 1 1 ...
##  $ proudness                     : Factor w/ 4 levels "1","2","3","4": 2 2 1 1 2 2 2 2 2 1 ...
##  $ lessMoneyToStay               : Factor w/ 5 levels "1","2","3","4",..: 5 2 5 1 4 4 4 4 2 2 ...
##  $ relationshipBtwColleague      : Factor w/ 4 levels "1","2","3","4": 2 1 2 1 2 4 1 1 3 2 ...
##  $ ageGroup                      : Factor w/ 4 levels "20-31","32-42",..: 2 2 1 4 2 2 4 4 2 1 ...
```

```
myTesDF2 %>% group_by(ageGroup) %>% count(ageGroup)%>%
  ggplot( aes(x="", y=n, fill=ageGroup)) +
  geom_bar(stat="identity", width=1) +
```

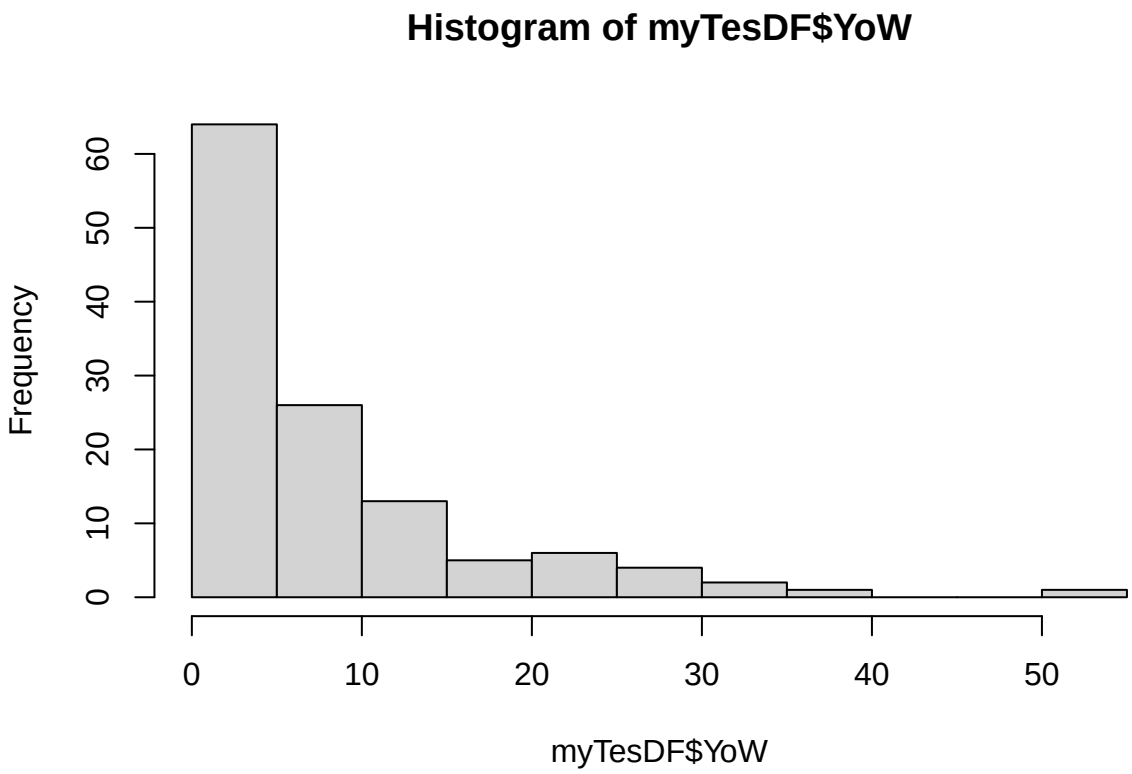
```
  coord_polar("y", start=0)+theme_void()+labs(title="pie chart of age group")
```



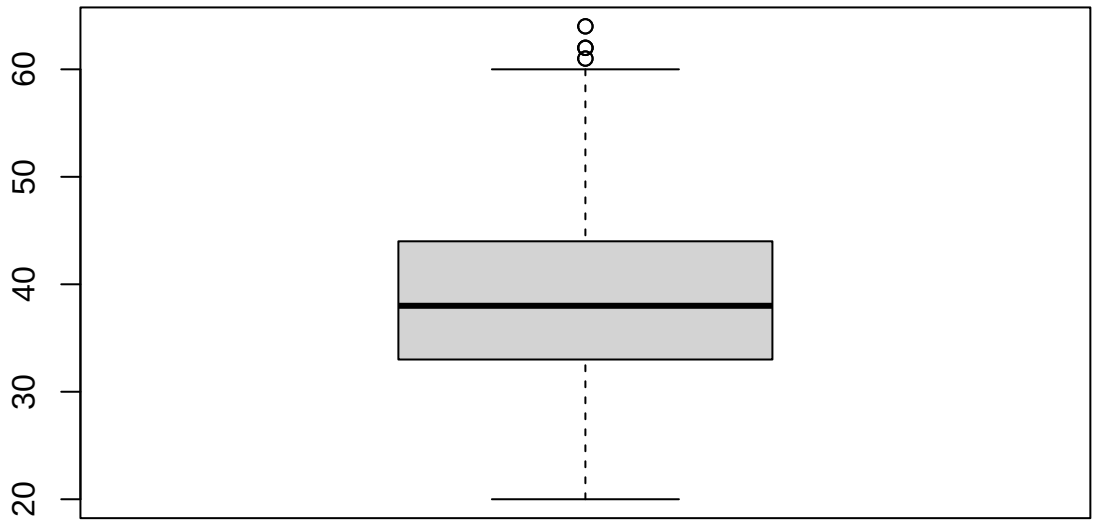

```
stem(myTesDF$age,scale = .5)
```

```
##
##   The decimal point is 1 digit(s) to the right of the |
##
##   2 | 02223334
##   2 | 555566778999
##   3 | 000112222233333334444444
##   3 | 55556666666777778888999999999
##   4 | 0000011111222333334444
##   4 | 5558889
##   5 | 00112223
##   5 | 77889
##   6 | 01122244
```

```
hist(myTesDF$YoW)
```




```
boxplot(myTesDF$age)
```




```
min(myTesDF$YoW)
```

Summary stats

```
## [1] 0.08
```

```
max(myTesDF$YoW)
```

```
## [1] 52.25
```

```
range(myTesDF$YoW)
```

```
## [1]  0.08 52.25
```

```
rangeOfDataFrame = max(myTesDF$YoW)-min(myTesDF$YoW)
rangeOfDataFrame
```

```
## [1] 52.17
```

```
mean(myTesDF$age)
```

```
## [1] 39.09836
```

```
sd(myTesDF$age)
```

```
## [1] 10.4339
```

```
var(myTesDF$age)
```

```
## [1] 108.8663
```

```
sqrt(myTesDF$age)
```

```
##   [1] 5.916080 5.744563 4.795832 7.745967 5.916080 5.830952 7.810250 7.681146
##   [9] 6.082763 5.477226 5.830952 5.830952 5.196152 6.164414 6.403124 7.615773
##  [17] 5.830952 6.928203 5.099020 6.244998 5.385165 6.000000 5.000000 6.244998
##  [25] 6.324555 7.280110 6.244998 5.196152 5.916080 5.000000 5.385165 4.795832
##  [33] 6.324555 6.000000 8.000000 6.557439 5.291503 6.928203 7.211103 5.656854
##  [41] 4.795832 6.633250 6.000000 5.744563 7.211103 6.164414 5.830952 7.874008
##  [49] 6.000000 6.082763 6.244998 7.810250 4.472136 4.690416 6.000000 6.928203
##  [57] 7.615773 7.071068 4.898979 6.633250 5.477226 5.656854 5.656854 6.633250
##  [65] 5.830952 6.480741 6.324555 6.082763 5.656854 5.567764 6.633250 6.244998
##  [73] 5.477226 6.403124 6.244998 5.744563 5.000000 5.567764 6.403124 6.480741
##  [81] 5.744563 6.000000 6.244998 6.244998 7.874008 7.874008 5.830952 7.211103
##  [89] 6.324555 6.557439 6.403124 8.000000 5.099020 6.708204 5.744563 6.000000
##  [97] 6.708204 7.141428 6.164414 7.549834 6.708204 6.557439 6.082763 5.744563
## [105] 7.141428 6.557439 6.480741 5.000000 6.324555 7.549834 6.164414 6.403124
## [113] 5.656854 6.244998 6.557439 7.071068 7.000000 5.916080 4.690416 5.744563
## [121] 5.385165 4.690416
```

```
fivenum(myTesDF$age)
```

```
## [1] 20 33 38 44 64
```

```
IQR(myTesDF$age)
```

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

```
quantile(myTesDF$age)
```

```
##   0%  25%  50%  75% 100%
##   20   33   38   44   64
```

```
summary(myTesDF$age)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    20.0    33.0    38.0    39.1    44.0    64.0
```

```
##
## n
## the number of non-NA observations in the sample.
##
## conf
## the lower and upper extremes of the 'notch' (if(do.conf)). See the details.

## out
## the values of any data points which lie beyond the extremes of the whiskers (if(do.out)).
##
## Note that $stats and $conf are sorted
##
boxplot.stats(myTesDF$age)
```

```
## $stats
## [1] 20 33 38 44 60
##
## $n
## [1] 122
##
```

```
## $conf
## [1] 36.42649 39.57351
##
## $out
## [1] 61 64 62 61 62 62 64
```

```
boxplot.stats(myTesDF$age)$conf
```

```
## [1] 36.42649 39.57351
```

```
# Data Frame Summary
summary(myTesDF)
```

```
##       age       gender satisfaction jobCharacteristicsVTM      YoW
##  Min.   :20.0   1:70   1:65         1:26                  Min.   : 0.080
##  1st Qu.:33.0   2:52   2:44         2: 8                  1st Qu.: 2.000
##  Median :38.0          3: 6         3: 6                  Median : 5.000
##  Mean   :39.1          4: 7         4:18                  Mean   : 8.224
##  3rd Qu.:44.0                       5:64                  3rd Qu.:11.000
##  Max.   :64.0                                             Max.   :52.250
##  likenessOfPromotionInF decisionAffectYourOwn paticipationOfBudgetaryDecision
##  1:21                    1:17                 1:67
##  2:28                    2:57                 2:55
##  3: 6                    3:45
##  4:29                    4: 3
##  5:38
##
##  proudness lessMoneyToStay relationshipBtwColleague
##  1:37      1:16            1:51
##  2:75      2:30            2:49
##  3: 9      3: 1            3:19
##  4: 1      4:57            4: 3
##            5:18
##
```

```
by(myTesDF$age,myTesDF$satisfaction,mean)
```

```
## myTesDF$satisfaction: 1
## [1] 40.67692
## ------------------------------------------------------------
## myTesDF$satisfaction: 2
## [1] 36.79545
## ------------------------------------------------------------
## myTesDF$satisfaction: 3
## [1] 43
## ------------------------------------------------------------
## myTesDF$satisfaction: 4
## [1] 35.57143
```

```
by(myTesDF$age,myTesDF$jobCharacteristicsVTM,sd)
```

```
## myTesDF$jobCharacteristicsVTM: 1
## [1] 11.73293
## ------------------------------------------------------------
## myTesDF$jobCharacteristicsVTM: 2
## [1] 14.26722
## ------------------------------------------------------------
```

```
## myTesDF$jobCharacteristicsVTM: 3
## [1] 3.834058
## ------------------------------------------------------------
## myTesDF$jobCharacteristicsVTM: 4
## [1] 12.62182
## ------------------------------------------------------------
## myTesDF$jobCharacteristicsVTM: 5
## [1] 9.227813
```

```
by(myTesDF$YoW,myTesDF$likenessOfPromotionInF,summary)
```

```
## myTesDF$likenessOfPromotionInF: 1
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   0.750   1.250   3.000   5.389   6.000  19.000
## ------------------------------------------------------------
## myTesDF$likenessOfPromotionInF: 2
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   0.160   2.060   4.500   8.148  10.000  31.910
## ------------------------------------------------------------
## myTesDF$likenessOfPromotionInF: 3
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.000   3.125   7.375   8.458  11.812  20.000
## ------------------------------------------------------------
## myTesDF$likenessOfPromotionInF: 4
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   0.580   3.000   5.500   8.066  10.000  52.250
## ------------------------------------------------------------
## myTesDF$likenessOfPromotionInF: 5
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   0.080   2.125   6.000   9.929  11.750  36.000
```

```
by(myTesDF$YoW,myTesDF$likenessOfPromotionInF,mean)
```

```
## myTesDF$likenessOfPromotionInF: 1
## [1] 5.388571
## ------------------------------------------------------------
## myTesDF$likenessOfPromotionInF: 2
## [1] 8.147857
## ------------------------------------------------------------
## myTesDF$likenessOfPromotionInF: 3
## [1] 8.458333
## ------------------------------------------------------------
## myTesDF$likenessOfPromotionInF: 4
## [1] 8.065862
## ------------------------------------------------------------
## myTesDF$likenessOfPromotionInF: 5
## [1] 9.929211
```

```
by(myTesDF$age,myTesDF$proudness,mean)
```

```
## myTesDF$proudness: 1
## [1] 40
## ------------------------------------------------------------
## myTesDF$proudness: 2
## [1] 39.25333
## ------------------------------------------------------------
```

```
## myTesDF$proudness: 3
## [1] 33.88889
## ------------------------------------------------------------
## myTesDF$proudness: 4
## [1] 41
```

```
by(myTesDF$age,myTesDF$likenessOfPromotionInF,mean)
```

```
## myTesDF$likenessOfPromotionInF: 1
## [1] 32.14286
## ------------------------------------------------------------
## myTesDF$likenessOfPromotionInF: 2
## [1] 38.57143
## ------------------------------------------------------------
## myTesDF$likenessOfPromotionInF: 3
## [1] 37.33333
## ------------------------------------------------------------
## myTesDF$likenessOfPromotionInF: 4
## [1] 40.65517
## ------------------------------------------------------------
## myTesDF$likenessOfPromotionInF: 5
## [1] 42.42105
```

```
aggregate(myTesDF$age,list("Type" = myTesDF$satisfaction),mean)
```

```
##   Type        x
## 1    1 40.67692
## 2    2 36.79545
## 3    3 43.00000
## 4    4 35.57143
```

```
aggregate(myTesDF$YoW,list("Type" = myTesDF$proudness),mean)
```

```
##   Type        x
## 1    1 7.744595
## 2    2 8.797467
## 3    3 6.212222
## 4    4 1.000000
```