# Assignment 1 MATH 208 (Question 2)

Parsa Yadollahi
260869949
MATH 208 - Assignment 1

## Question 2

a)

```
csv_data =
  read_csv(
    "https://archive.ics.uci.edu/ml/machine-learning-databases/abalone/abalone.data",
    col_names=F)
```

```
## Parsed with column specification:
## cols(
##   X1 = col_character(),
##   X2 = col_double(),
##   X3 = col_double(),
##   X4 = col_double(),
##   X5 = col_double(),
##   X6 = col_double(),
##   X7 = col_double(),
##   X8 = col_double(),
##   X9 = col_double()
## )
```

b)

```
names(csv_data)=
  c("Sex","Length","Diameter","Height",
    "Whole weight", "Shucked weight",
    "Viscera weight","Shell weight","Rings")
csv_data
```

```
## # A tibble: 4,177 x 9
##     Sex   Length Diameter Height 'Whole weight' 'Shucked weight' 'Viscera weight'
##     <chr>  <dbl>   <dbl>  <dbl>         <dbl>           <dbl>            <dbl>
## 1 M      0.455   0.365  0.095         0.514           0.224            0.101
## 2 M      0.35    0.265  0.09          0.226           0.0995           0.0485
## 3 F      0.53    0.42   0.135         0.677           0.256            0.142
## 4 M      0.44    0.365  0.125         0.516           0.216            0.114
## 5 I      0.33    0.255  0.08          0.205           0.0895           0.0395
```

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```
##  6 I       0.425    0.3    0.095        0.352        0.141            0.0775
##  7 F       0.53     0.415  0.15         0.778        0.237            0.142
##  8 F       0.545    0.425  0.125        0.768        0.294            0.150
##  9 M       0.475    0.37   0.125        0.509        0.216            0.112
## 10 F       0.55     0.44   0.15         0.894        0.314            0.151
## # ... with 4,167 more rows, and 2 more variables: 'Shell weight' <dbl>,
## #   Rings <dbl>
```

c)

```
csv_data_radius=csv_data%>%mutate(Radius=Diameter/2)
csv_data_radius
```

```
## # A tibble: 4,177 x 10
##     Sex   Length Diameter Height 'Whole weight' 'Shucked weight' 'Viscera weight'
##     <chr> <dbl>    <dbl> <dbl>          <dbl>            <dbl>            <dbl>
##  1 M       0.455    0.365  0.095        0.514        0.224            0.101
##  2 M       0.35     0.265  0.09         0.226        0.0995           0.0485
##  3 F       0.53     0.42   0.135        0.677        0.256            0.142
##  4 M       0.44     0.365  0.125        0.516        0.216            0.114
##  5 I       0.33     0.255  0.08         0.205        0.0895           0.0395
##  6 I       0.425    0.3    0.095        0.352        0.141            0.0775
##  7 F       0.53     0.415  0.15         0.778        0.237            0.142
##  8 F       0.545    0.425  0.125        0.768        0.294            0.150
##  9 M       0.475    0.37   0.125        0.509        0.216            0.112
## 10 F       0.55     0.44   0.15         0.894        0.314            0.151
## # ... with 4,167 more rows, and 3 more variables: 'Shell weight' <dbl>,
## #   Rings <dbl>, Radius <dbl>
```

d)

```
csv_data_groupby_sex = group_by(
  csv_data_radius,Sex
  )
csv_data_groupby_sex_minmax =
  csv_data_groupby_sex%>%
  summarise(
    "Max"= max(Rings), "Min"= min(Rings)
    )
```

```
## 'summarise()' ungrouping output (override with '.groups' argument)
```

```
csv_data_groupby_sex_minmax
```

```
## # A tibble: 3 x 3
##    Sex     Max   Min
##    <chr> <dbl> <dbl>
## 1 F         29     5
## 2 I         21     1
## 3 M         27     3
```
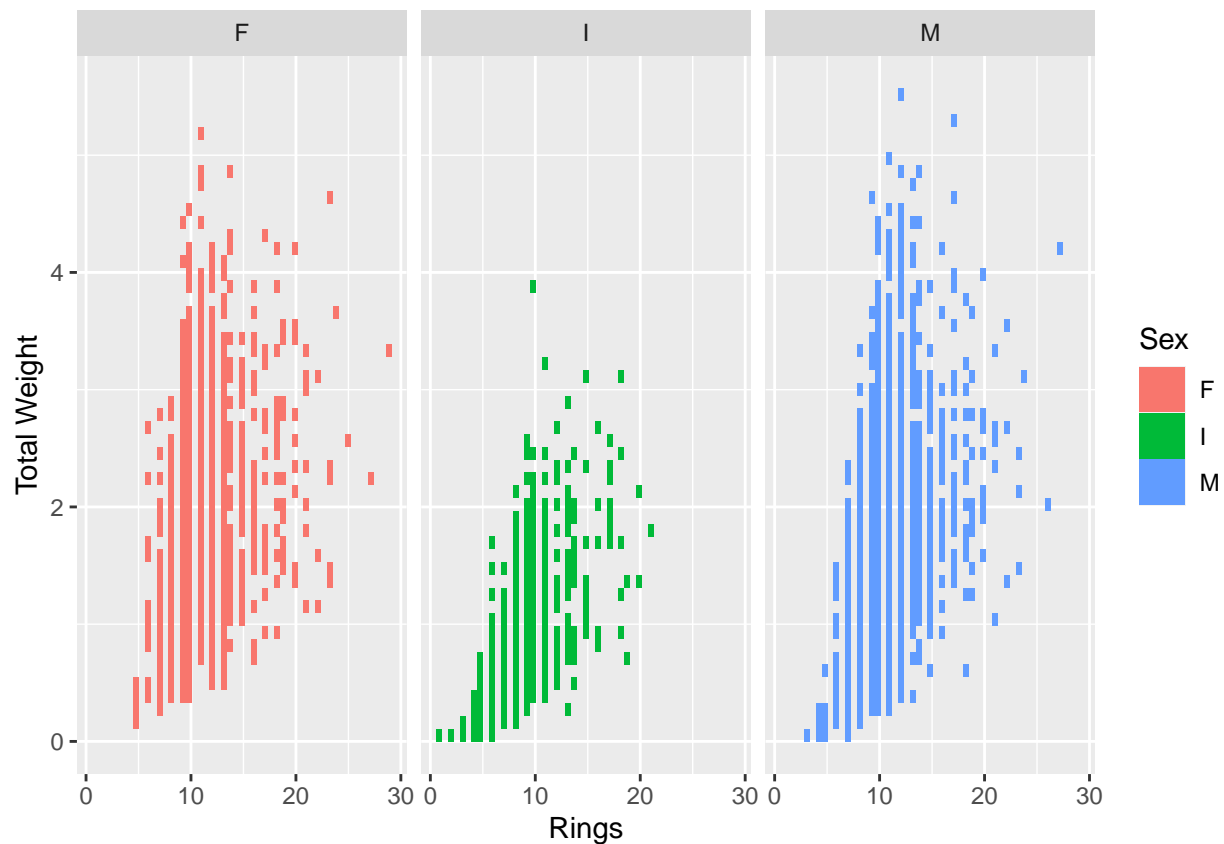
e)

```
csv_data_weight=
  csv_data%>%mutate(
    "Total Weight"='Whole weight'+'Shucked weight'
    +'Viscera weight'+'Shell weight')

ggplot(
  csv_data_weight,
  aes(
    x=Rings,
    y='Total Weight',
    group=Sex,
    fill=Sex
    )
  ) + geom_bin2d(bins=50)+ labs(
    x="Rings",
    y="Total Weight"
  ) + facet_wrap(~Sex)
```



We can see from the plot above that there are not much discrepancies between male and female, which leads us to deduct that the relation between the number of rings and the total weight does not depend when comparing males and females.Yet comparing the sex I, we can see that on average, they have a smaller amount of rings compared to males and females.