assignment 1

Load data

```
avocado = read.csv(file = "https://github.com/KazuMaeshima/Group-9-/raw/main/avocado.csv",
    header = TRUE)
```

##Provide a introduction of your analysis in the .RMD file so it can be produced in the output # this codes will introduce us how to use R Studio as part of our day to day data analysis. It will produce variables, mean,median,mode, show and manipulate data and plot graphs using ggplot2 ## head ## Print the structure of your dataset.

```
str(avocado)
```

```
## 'data.frame':    18249 obs. of  14 variables:
##  $ X           : int  0 1 2 3 4 5 6 7 8 9 ...
##  $ Date        : chr  "2015-12-27" "2015-12-20" "2015-12-13" "2015-12-06" ...
##  $ AveragePrice: num  1.33 1.35 0.93 1.08 1.28 1.26 0.99 0.98 1.02 1.07 ...
##  $ Total.Volume: num  64237 54877 118220 78992 51040 ...
##  $ X4046       : num  1037 674 795 1132 941 ...
##  $ X4225       : num  54455 44639 109150 71976 43838 ...
##  $ X4770       : num  48.2 58.3 130.5 72.6 75.8 ...
##  $ Total.Bags  : num  8697 9506 8145 5811 6184 ...
##  $ Small.Bags  : num  8604 9408 8042 5677 5986 ...
##  $ Large.Bags  : num  93.2 97.5 103.1 133.8 197.7 ...
##  $ XLarge.Bags : num  0 0 0 0 0 0 0 0 0 0 ...
##  $ type        : chr  "conventional" "conventional" "conventional" "conventional" ...
##  $ year        : int  2015 2015 2015 2015 2015 2015 2015 2015 2015 2015 ...
##  $ region      : chr  "Albany" "Albany" "Albany" "Albany" ...
```

##List the variables in your dataset

```
names(avocado)
```

```
##  [1] "X"            "Date"         "AveragePrice" "Total.Volume" "X4046"
##  [6] "X4225"        "X4770"        "Total.Bags"   "Small.Bags"   "Large.Bags"
## [11] "XLarge.Bags"  "type"         "year"         "region"
```

##Print the top 15 rows of your dataset.

```
head(avocado, 15)
```

```
##     X       Date AveragePrice Total.Volume    X4046     X4225  X4770 Total.Bags
## 1   0 2015-12-27         1.33     64236.62 1036.74  54454.85  48.16    8696.87
## 2   1 2015-12-20         1.35     54876.98  674.28  44638.81  58.33    9505.56
## 3   2 2015-12-13         0.93    118220.22  794.70 109149.67 130.50    8145.35
## 4   3 2015-12-06         1.08     78992.15 1132.00  71976.41  72.58    5811.16
## 5   4 2015-11-29         1.28     51039.60  941.48  43838.39  75.78    6183.95
## 6   5 2015-11-22         1.26     55979.78 1184.27  48067.99  43.61    6683.91
## 7   6 2015-11-15         0.99     83453.76 1368.92  73672.72  93.26    8318.86
## 8   7 2015-11-08         0.98    109428.33  703.75 101815.36  80.00    6829.22
## 9   8 2015-11-01         1.02     99811.42 1022.15  87315.57  85.34   11388.36
## 10  9 2015-10-25         1.07     74338.76  842.40  64757.44 113.00    8625.92
## 11 10 2015-10-18         1.12     84843.44  924.86  75595.85 117.07    8205.66
## 12 11 2015-10-11         1.28     64489.17 1582.03  52677.92 105.32   10123.90
## 13 12 2015-10-04         1.31     61007.10 2268.32  49880.67 101.36    8756.75
## 14 13 2015-09-27         0.99    106803.39 1204.88  99409.21 154.84    6034.46
## 15 14 2015-09-20         1.33     69759.01 1028.03  59313.12 150.50    9267.36
##    Small.Bags Large.Bags XLarge.Bags         type year region
## 1     8603.62      93.25           0 conventional 2015 Albany
## 2     9408.07      97.49           0 conventional 2015 Albany
## 3     8042.21     103.14           0 conventional 2015 Albany
## 4     5677.40     133.76           0 conventional 2015 Albany
## 5     5986.26     197.69           0 conventional 2015 Albany
## 6     6556.47     127.44           0 conventional 2015 Albany
## 7     8196.81     122.05           0 conventional 2015 Albany
## 8     6266.85     562.37           0 conventional 2015 Albany
## 9    11104.53     283.83           0 conventional 2015 Albany
## 10    8061.47     564.45           0 conventional 2015 Albany
## 11    7877.86     327.80           0 conventional 2015 Albany
## 12    9866.27     257.63           0 conventional 2015 Albany
## 13    8379.98     376.77           0 conventional 2015 Albany
## 14    5888.87     145.59           0 conventional 2015 Albany
## 15    8489.10     778.26           0 conventional 2015 Albany
```

##Write a user defined function using any of the variables from the data set

```r
m <- c(45, 34, 34, 34, 67)
getmode <- function(m) {
    uniqv <- unique(m)
    uniqv[which.max(tabulate(match(m, uniqv)))]
}
getmode(m)
```

```
## [1] 34
```

##Use data manipulation techniques and filter rows based on any logical criteria that exist in your dataset

```r
filter(avocado, AveragePrice < 0.5)
```

```
##    X       Date AveragePrice Total.Volume      X4046     X4225    X4770
## 1  0 2015-12-27         0.49   1137707.43  738314.80 286858.37 11642.46
## 2 47 2017-02-05         0.46   2200550.27 1200632.86 531226.65 18324.93
## 3 43 2017-03-05         0.44     64057.04     223.84   4748.88     0.00
## 4 44 2017-02-26         0.49     44024.03     252.79   4472.68     0.00
## 5 43 2017-03-05         0.48     50890.73     717.57   4138.84     0.00
##   Total.Bags Small.Bags Large.Bags XLarge.Bags         type year
## 1  100891.80   70749.02   30142.78        0.00 conventional 2015
## 2  450365.83  113752.17  330583.10     6030.56 conventional 2017
## 3   59084.32     638.68   58445.64        0.00      organic 2017
## 4   39298.56     600.00   38698.56        0.00      organic 2017
## 5   46034.32    1385.06   44649.26        0.00      organic 2017
##             region
## 1    PhoenixTucson
## 2    PhoenixTucson
## 3 CincinnatiDayton
## 4 CincinnatiDayton
## 5          Detroit
```

##Identify the dependent & independent variables and use reshaping techniques and create a new data frame by joining those variablesfrom your dataset.
# Create a new dataset with the selected columns

```
bags <- as.data.frame(avocado %>%
    select(Total.Bags, Small.Bags, Large.Bags, XLarge.Bags))
```

##Remove missing values in your dataset.

```
x = na.omit(avocado)
head(x, 10)
```

```
##    X       Date AveragePrice Total.Volume   X4046     X4225  X4770 Total.Bags
## 1  0 2015-12-27         1.33     64236.62 1036.74  54454.85  48.16    8696.87
## 2  1 2015-12-20         1.35     54876.98  674.28  44638.81  58.33    9505.56
## 3  2 2015-12-13         0.93    118220.22  794.70 109149.67 130.50    8145.35
## 4  3 2015-12-06         1.08     78992.15 1132.00  71976.41  72.58    5811.16
## 5  4 2015-11-29         1.28     51039.60  941.48  43838.39  75.78    6183.95
## 6  5 2015-11-22         1.26     55979.78 1184.27  48067.99  43.61    6683.91
## 7  6 2015-11-15         0.99     83453.76 1368.92  73672.72  93.26    8318.86
## 8  7 2015-11-08         0.98    109428.33  703.75 101815.36  80.00    6829.22
## 9  8 2015-11-01         1.02     99811.42 1022.15  87315.57  85.34   11388.36
## 10 9 2015-10-25         1.07     74338.76  842.40  64757.44 113.00    8625.92
##    Small.Bags Large.Bags XLarge.Bags         type year region
## 1     8603.62      93.25           0 conventional 2015 Albany
## 2     9408.07      97.49           0 conventional 2015 Albany
## 3     8042.21     103.14           0 conventional 2015 Albany
## 4     5677.40     133.76           0 conventional 2015 Albany
## 5     5986.26     197.69           0 conventional 2015 Albany
## 6     6556.47     127.44           0 conventional 2015 Albany
## 7     8196.81     122.05           0 conventional 2015 Albany
## 8     6266.85     562.37           0 conventional 2015 Albany
## 9    11104.53     283.83           0 conventional 2015 Albany
## 10    8061.47     564.45           0 conventional 2015 Albany
```

##Identify and remove duplicated data in your dataset.

##Reorder multiple rows in descending order

##Rename some of the column names in your dataset.

```
head(avocado)
```

```
##   X       Date AveragePrice Total.Volume   X4046     X4225  X4770 Total.Bags
## 1 0 2015-12-27         1.33     64236.62 1036.74  54454.85  48.16    8696.87
## 2 1 2015-12-20         1.35     54876.98  674.28  44638.81  58.33    9505.56
## 3 2 2015-12-13         0.93    118220.22  794.70 109149.67 130.50    8145.35
## 4 3 2015-12-06         1.08     78992.15 1132.00  71976.41  72.58    5811.16
## 5 4 2015-11-29         1.28     51039.60  941.48  43838.39  75.78    6183.95
## 6 5 2015-11-22         1.26     55979.78 1184.27  48067.99  43.61    6683.91
##   Small.Bags Large.Bags XLarge.Bags         type year region
## 1    8603.62      93.25           0 conventional 2015 Albany
## 2    9408.07      97.49           0 conventional 2015 Albany
## 3    8042.21     103.14           0 conventional 2015 Albany
## 4    5677.40     133.76           0 conventional 2015 Albany
## 5    5986.26     197.69           0 conventional 2015 Albany
## 6    6556.47     127.44           0 conventional 2015 Albany
```

```
m <- avocado
dim(m)
```

```
## [1] 18249    14
```

```
col_name <- paste("Col", 1:14, sep = "")
head(m)
```

```
##   X       Date AveragePrice Total.Volume   X4046     X4225  X4770 Total.Bags
## 1 0 2015-12-27         1.33     64236.62 1036.74  54454.85  48.16    8696.87
## 2 1 2015-12-20         1.35     54876.98  674.28  44638.81  58.33    9505.56
## 3 2 2015-12-13         0.93    118220.22  794.70 109149.67 130.50    8145.35
## 4 3 2015-12-06         1.08     78992.15 1132.00  71976.41  72.58    5811.16
## 5 4 2015-11-29         1.28     51039.60  941.48  43838.39  75.78    6183.95
## 6 5 2015-11-22         1.26     55979.78 1184.27  48067.99  43.61    6683.91
##   Small.Bags Large.Bags XLarge.Bags         type year region
## 1    8603.62      93.25           0 conventional 2015 Albany
## 2    9408.07      97.49           0 conventional 2015 Albany
## 3    8042.21     103.14           0 conventional 2015 Albany
## 4    5677.40     133.76           0 conventional 2015 Albany
## 5    5986.26     197.69           0 conventional 2015 Albany
## 6    6556.47     127.44           0 conventional 2015 Albany
```

```
names(m) <- col_name
head(m)
```

```
##   Col1       Col2 Col3      Col4    Col5      Col6   Col7    Col8    Col9
## 1    0 2015-12-27 1.33  64236.62 1036.74  54454.85  48.16 8696.87 8603.62
## 2    1 2015-12-20 1.35  54876.98  674.28  44638.81  58.33 9505.56 9408.07
## 3    2 2015-12-13 0.93 118220.22  794.70 109149.67 130.50 8145.35 8042.21
## 4    3 2015-12-06 1.08  78992.15 1132.00  71976.41  72.58 5811.16 5677.40
## 5    4 2015-11-29 1.28  51039.60  941.48  43838.39  75.78 6183.95 5986.26
## 6    5 2015-11-22 1.26  55979.78 1184.27  48067.99  43.61 6683.91 6556.47
##    Col10 Col11        Col12 Col13  Col14
## 1  93.25     0 conventional  2015 Albany
## 2  97.49     0 conventional  2015 Albany
## 3 103.14     0 conventional  2015 Albany
## 4 133.76     0 conventional  2015 Albany
## 5 197.69     0 conventional  2015 Albany
## 6 127.44     0 conventional  2015 Albany
```

##Add new variables in your data frame by using a mathematical function (for e.g. –multiply an existing column by 2 and add it as a new variable to your data frame) ##Create new variable by mutliplying an existing column by 2

```
avocado$Doubleyear = avocado$year * 2
```

##Create a training set using random number generator engine. # Initiate random number generator engine

```
set.seed(1234)
```

Select 80% rows from the main dataset as the training set

```
training = avocado %>%
    sample_frac(0.8, replace = FALSE)
```

#Print the summary statistics of your dataset.

```
summary(avocado)
```

```
##        X             Date           AveragePrice    Total.Volume
##  Min.   : 0.00   Length:18249      Min.   :0.440   Min.   :      85
##  1st Qu.:10.00   Class :character  1st Qu.:1.100   1st Qu.:   10839
##  Median :24.00   Mode  :character  Median :1.370   Median :  107377
##  Mean   :24.23                     Mean   :1.406   Mean   :  850644
##  3rd Qu.:38.00                     3rd Qu.:1.660   3rd Qu.:  432962
##  Max.   :52.00                     Max.   :3.250   Max.   :62505647
##      X4046              X4225              X4770           Total.Bags
##  Min.   :       0   Min.   :       0   Min.   :      0   Min.   :       0
##  1st Qu.:     854   1st Qu.:    3009   1st Qu.:      0   1st Qu.:    5089
##  Median :    8645   Median :   29061   Median :    185   Median :   39744
##  Mean   :  293008   Mean   :  295155   Mean   :  22840   Mean   :  239639
##  3rd Qu.:  111020   3rd Qu.:  150207   3rd Qu.:   6243   3rd Qu.:  110783
##  Max.   :22743616   Max.   :20470573   Max.   :2546439   Max.   :19373134
##    Small.Bags         Large.Bags       XLarge.Bags           type
##  Min.   :       0   Min.   :      0   Min.   :     0.0   Length:18249
##  1st Qu.:    2849   1st Qu.:    127   1st Qu.:     0.0   Class :character
##  Median :   26363   Median :   2648   Median :     0.0   Mode  :character
##  Mean   :  182195   Mean   :  54338   Mean   :  3106.4
##  3rd Qu.:   83338   3rd Qu.:  22029   3rd Qu.:   132.5
##  Max.   :13384587   Max.   :5719097   Max.   :551693.7
##       year         region            Doubleyear
##  Min.   :2015   Length:18249       Min.   :4030
##  1st Qu.:2015   Class :character   1st Qu.:4030
##  Median :2016   Mode  :character   Median :4032
##  Mean   :2016                      Mean   :4032
##  3rd Qu.:2017                      3rd Qu.:4034
##  Max.   :2018                      Max.   :4036
```

##Use any of the numerical variables from the dataset and perform the following statistical functions. Mean

```
mean(avocado$Large.Bags)
```

```
## [1] 54338.09
```

##Median

```
median(avocado$Total.Bags)
```

```
## [1] 39743.83
```

##Mode

```
v <- c(avocado$AveragePrice)
# Calculate the mode using the user defined function
result <- getmode(v)
print(result)
```

```
## [1] 1.15
```

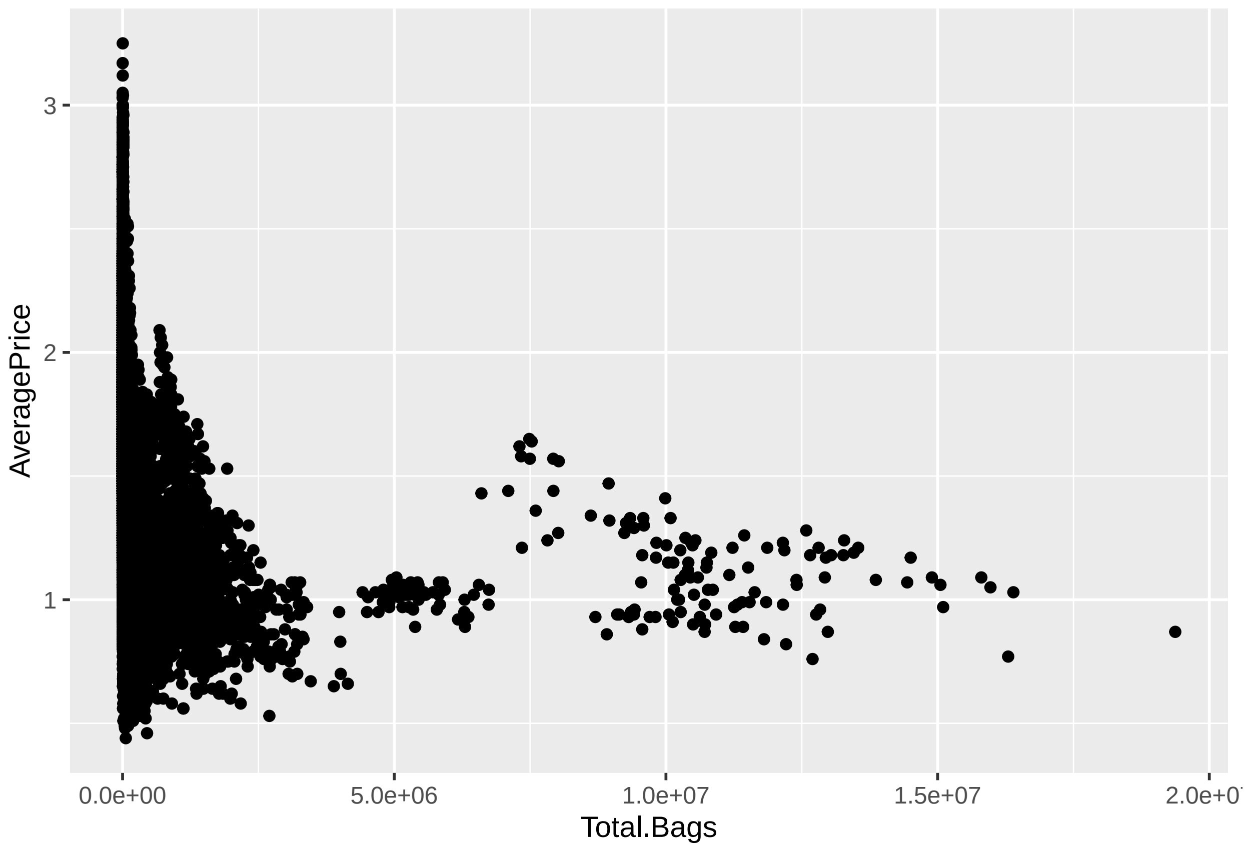
##Range

```
range(avocado$Total.Bags)
```

```
## [1]        0 19373134
```

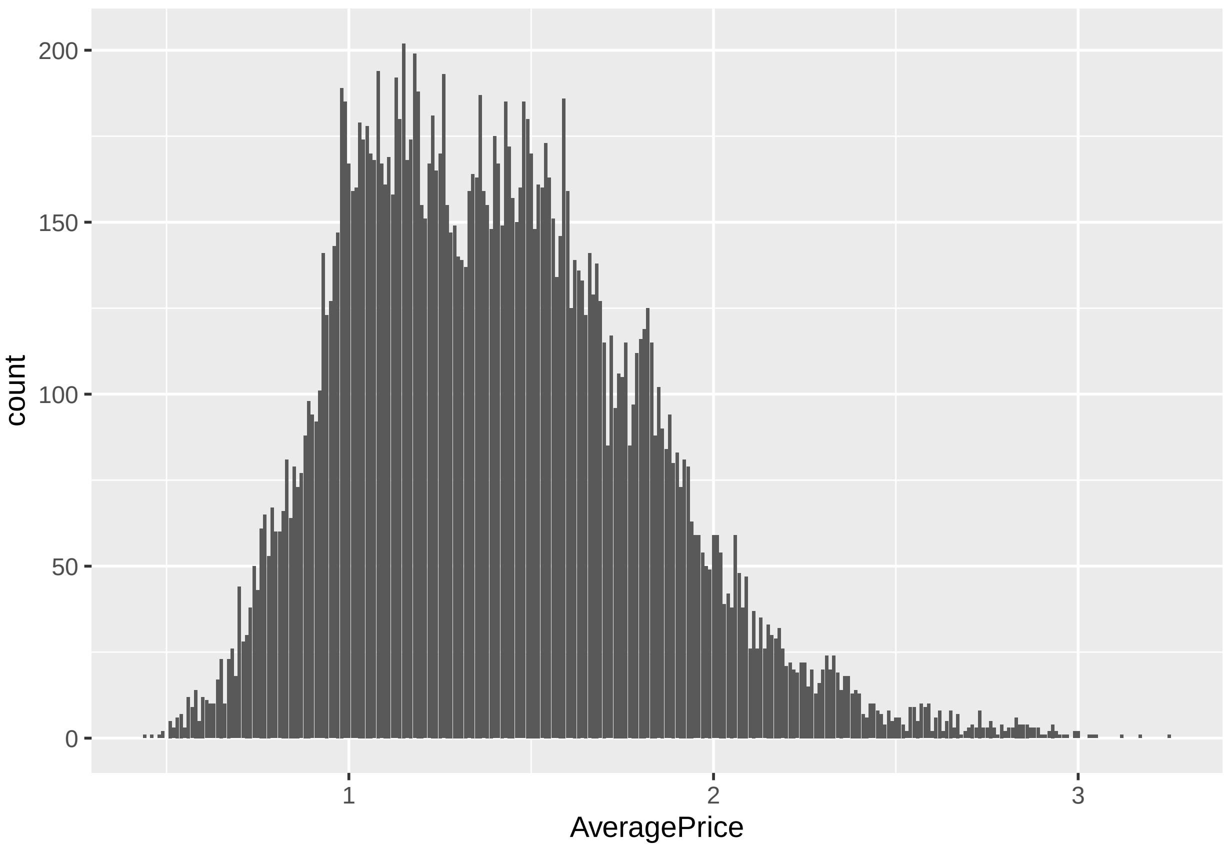
##Plot a scatter plot for any 2 variables in your dataset.

```
ggplot(data = avocado, aes(x = Total.Bags, y = AveragePrice)) + geom_point()
```



##Plot a bar plot for any 1 variables in your dataset

```
ggplot(data = avocado, aes(x = AveragePrice)) + geom_bar()
```



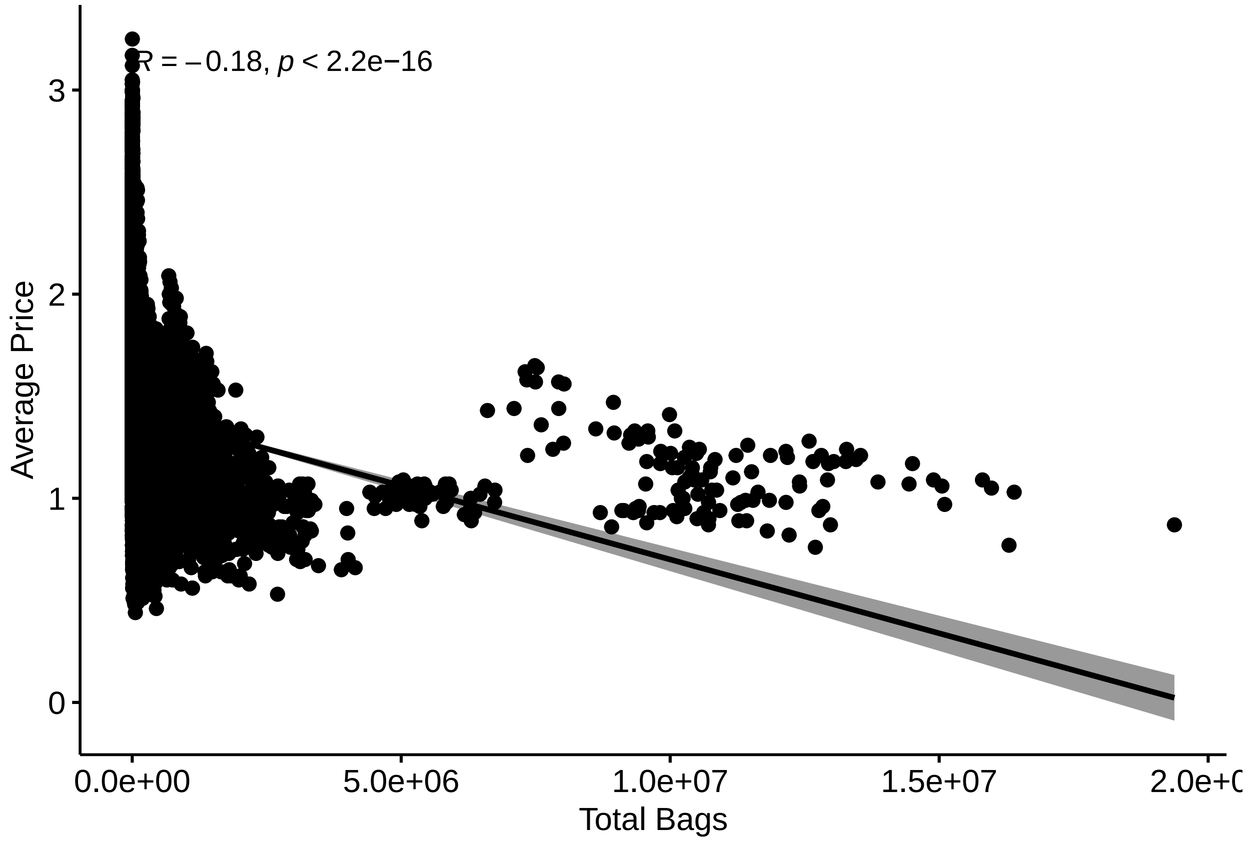
##Find the correlation between any 2 variables by applying least square linear regression model.

```
library(ggpubr)
```

```
## Warning: package 'ggpubr' was built under R version 4.0.5
```

```
ggscatter(avocado, x = "Total.Bags", y = "AveragePrice", add = "reg.line", conf.int = TRUE,
    cor.coef = TRUE, cor.method = "pearson", xlab = "Total Bags", ylab = "Average Price")
```

```
## `geom_smooth()` using formula 'y ~ x'
```



##Provide a conclusion of your analysis if any in the .RMD file. #there are different types of avocados. Each avocados corresponds with their respective price based on their size and each country prices their avocados differently