IT2120 - Probability and Statistics

Lab Sheet 04

Exercise

1.

```
> setwd("C:\\Users\\it24100330\\Desktop\\IT24100330")
> branch_data <-read.table("Exercise.txt" , header=TRUE, sep = ",")
> str(branch_data)
'data.frame':   30 obs. of  4 variables:
 $ Branch        : int  1 2 3 4 5 6 7 8 9 10 ...
 $ Sales_X1      : num  3.4 4.1 2.8 5 3.7 4.5 3 4.9 3.2 2.5 ...
 $ Advertising_X2: int  120 150 90 200 110 175 95 185 105 80 ...
 $ Years_X3      : int  4 7 3 10 5 6 2 9 4 1 ...
```

2.

Branch-Categorical

Sales_X1-Quantitative (Ratio Scale, Continuous)

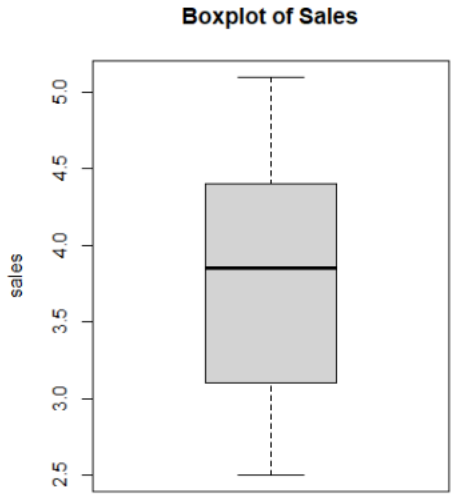
Advertising_X2-Quantitative (Ratio Scale, continuous)

Years_X3- Quantitative (Ratio Scale, discrete-whole years)

3.

```
boxplot(branch_data$Sales, main = "Boxplot of Sales",ylab = "sales")
```

```
> boxplot(branch_data$Sales, main = "Boxplot of Sales",ylab = "sales")
```



4.

```
quantile(branch_data$Advertising_X2)
summary(branch_data$Advertising_X2)
IQR(branch_data$Advertising_X2)
```

```
> quantile(branch_data$Advertising_X2)
    0%    25%    50%    75%   100%
 80.00 101.25 132.50 158.75 210.00
> summary(branch_data$Advertising_X2)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
   80.0   101.2   132.5   134.8   158.8   210.0
> IQR(branch_data$Advertising_X2)
[1] 57.5
```

5.

```
> find_outliers <- function(x) {
+   Q1 <- quantile(x, 0.25)
+   Q3 <- quantile(x, 0.75)
+   IQR_value <- Q3 - Q1
+   lower_bound <- Q1 - 1.5 * IQR_value
+   upper_bound <- Q3 + 1.5 * IQR_value
+   return(x[x < lower_bound | x > upper_bound])
+ }
>
> find_outliers(branch_data$Years)
integer(0)
```

```
find_outliers <- function(x) {
  Q1 <- quantile(x, 0.25)
  Q3 <- quantile(x, 0.75)
  IQR_value <- Q3 - Q1
  lower_bound <- Q1 - 1.5 * IQR_value
  upper_bound <- Q3 + 1.5 * IQR_value
  return(x[x < lower_bound | x > upper_bound])
}

find_outliers(branch_data$Years)
```