IT24103522

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Probability and Statistics

Exercise

1. Import the dataset (’Exercise.txt’) into R and store it in a data frame called ”branch data”.

```
1  setwd("C:/Users/it24103522/Desktop")
2  getwd()
3  branch_data <- read.csv("Exercise.txt", header = TRUE)
4  head(branch_data)
```

```
> branch_data <- read.csv("Exercise.txt", header = TRUE)
> head(branch_data)
  Branch Sales_X1 Advertising_X2 Years_X3
1      1      3.4            120        4
2      2      4.1            150        7
3      3      2.8             90        3
4      4      5.0            200       10
5      5      3.7            110        5
6      6      4.5            175        6
```

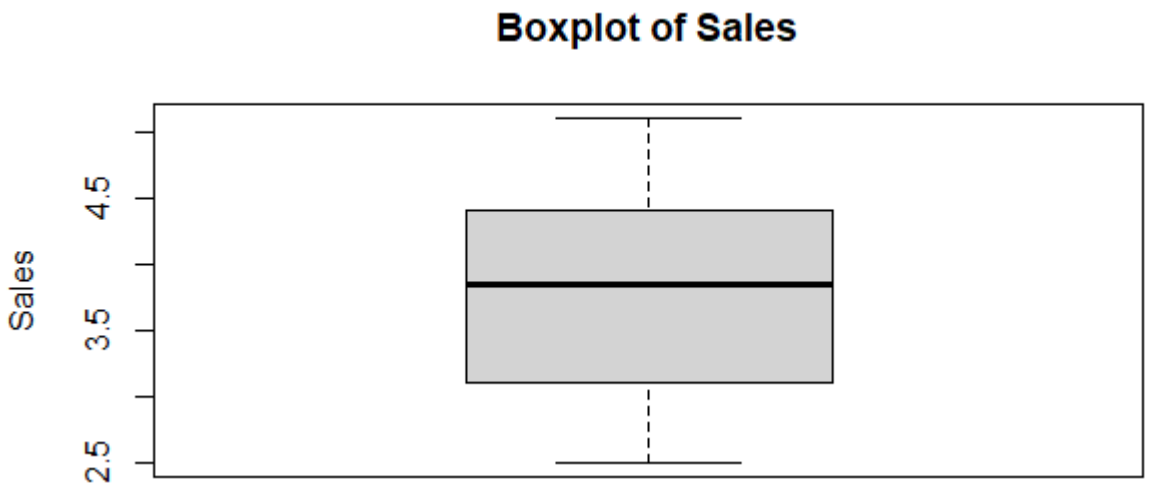
2. Identify the variable type and scale of measurement for each variable.

```
6  str(branch_data)
```

```
> 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 ...
```

3. Obtain boxplot for sales and interpret the shape of the sales distribution.

```
8  boxplot(branch_data$Sales_X1, main = "Boxplot of Sales", ylab = "Sales")
```



4. Calculate the five number summary and IQR for advertising variable.

```
10  fivenum(branch_data$Advertising_X2)
> fivenum(branch_data$Advertising_X2)
[1]  80.0 100.0 132.5 160.0 210.0
12  IQR(branch_data$Advertising_X2)
> IQR(branch_data$Advertising_X2)
[1] 57.5
```

5. Write an R function to find the outliers in a numeric vector and check for outliers in years variables.

```
15 find_outliers <- function(x) {
16   Q1 <- quantile(x, 0.25)
17   Q3 <- quantile(x, 0.75)
18   IQR_value <- Q3 - Q1
19   lower_bound <- Q1 - 1.5 * IQR_value
20   upper_bound <- Q3 + 1.5 * IQR_value
21   outliers <- x[x < lower_bound | x > upper_bound]
22   return(outliers)
> 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
+   outliers <- x[x < lower_bound | x > upper_bound]
+   return(outliers)
+ }
```