

Faculty of Computing
Year 2 Semester 1 (2025)
IT2120 - Probability and Statistics
Lab Sheet 04

Q1

```
IT24103878.R* x
Source on Save Run Source
1 setwd('C:\\Users\\it24103878\\Desktop\\IT24103878')
2 #Q 1.
3 branch_data <- read.table("Exercise.txt", header = TRUE, sep = ",")
4 print("Dataset Imported Successfully")
5 print(head(branch_data))
6

> setwd('C:\\Users\\it24103878\\Desktop\\IT24103878')
> branch_data <- read.table("Exercise.txt", header = TRUE, sep = ",")
> print("Dataset Imported Successfully")
[1] "Dataset Imported Successfully"
> print(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
> |
```

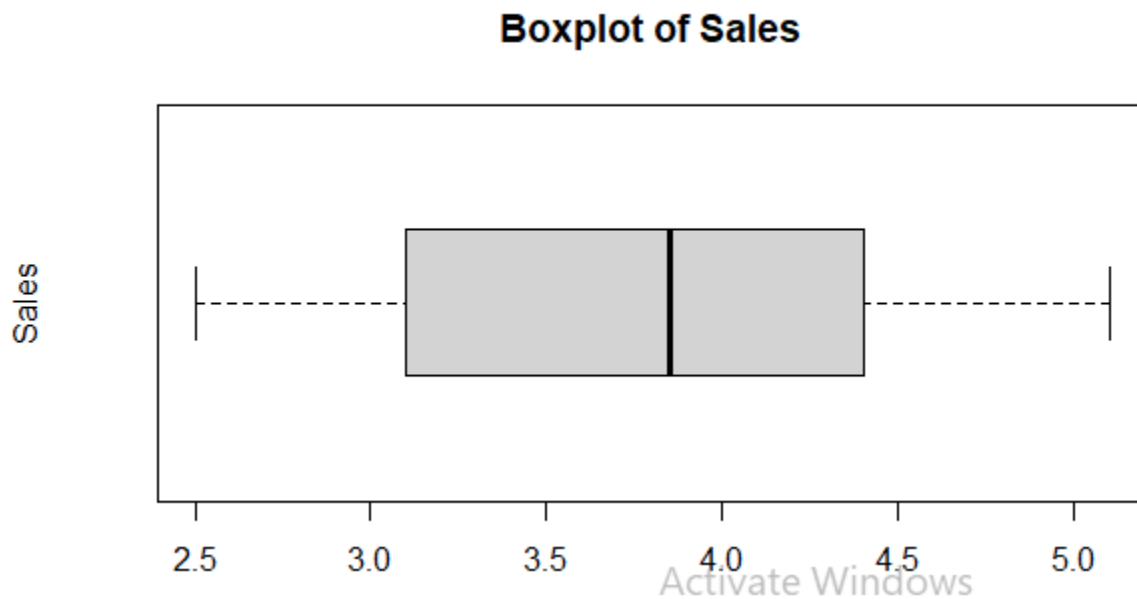
Q2

```
7 #Q2.
8 str(branch_data)
9 # Interpretation:
```

```
> 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 ...
> |
```

Q3

```
12 # Q3
13 boxplot(branch_data$Sales_X1, main = "Boxplot of Sales", ylab = "Sales",
14         outline = TRUE, outpch = 8, horizontal = TRUE)
15
> boxplot(branch_data$Sales_X1, main = "Boxplot of Sales", ylab = "Sales",
+         outline = TRUE, outpch = 8, horizontal = TRUE)
> |
```



Q4

```
17 # Q4.  
18 summary(branch_data$Advertising_X2)  
19 iqr_advertising <- IQR(branch_data$Advertising_X2)  
20 cat("IQR for Advertising:", iqr_advertising, "\n")  
21
```

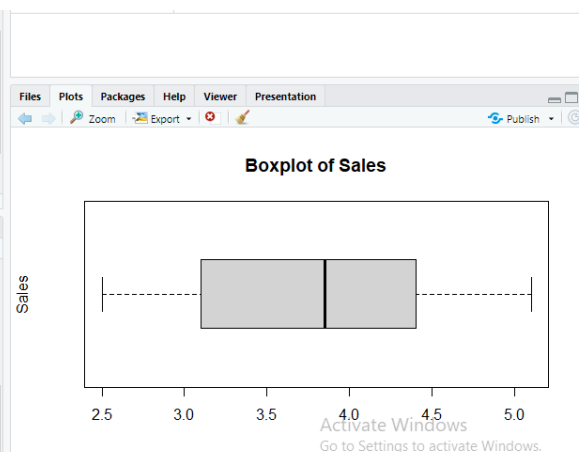
```
> summary(branch_data$Advertising_X2)  
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.   
  80.0  101.2  132.5  134.8  158.8  210.0   
> iqr_advertising <- IQR(branch_data$Advertising_X2)  
> cat("IQR for Advertising:", iqr_advertising, "\n")  
IQR for Advertising: 57.5  
> |
```

Q5

```
23 # Q5  
24 find_outliers <- function(x) {  
25   Q1 <- quantile(x, 0.25, na.rm = TRUE)  
26   Q3 <- quantile(x, 0.75, na.rm = TRUE)  
27   IQR_val <- Q3 - Q1  
28   lower_bound <- Q1 - 1.5 * IQR_val  
29   upper_bound <- Q3 + 1.5 * IQR_val  
30   outliers <- x[x < lower_bound | x > upper_bound]  
31   return(outliers)  
32 }
```

```
33 # Q6  
34 outliers_years <- find_outliers(branch_data$Years_X3)  
35 find_outliers(x)
```

```
Console Terminal Background Jobs  
R 4.2.2 - C:/Users/t24103878/Desktop/IT24103878/ <+>  
Min. 1st Qu. Median Mean 3rd Qu. Max.  
80.0 101.2 132.5 134.8 158.8 210.0  
+ iqr_advertising <- IQR(branch_data$Advertising_X2)  
+ cat("IQR for Advertising:", iqr_advertising, "\n")  
+ IQR for Advertising: 57.5  
+ find_outliers <- function(x) {  
+   Q1 <- quantile(x, 0.25, na.rm = TRUE)  
+   Q3 <- quantile(x, 0.75, na.rm = TRUE)  
+   IQR_val <- Q3 - Q1  
+   lower_bound <- Q1 - 1.5 * IQR_val  
+   upper_bound <- Q3 + 1.5 * IQR_val  
+   outliers <- x[x < lower_bound | x > upper_bound]  
+   return(outliers)  
+ }
```



Q6

```
34 outliers_years <- find_outliers(branch_data$Years_X3)  
35 print("Outliers in Years:")  
36 print(outliers_years)  
37
```

```
36:22 (Top Level) <+>  
Console Terminal Background Jobs  
R 4.2.2 - C:/Users/t24103878/Desktop/IT24103878/ <+>  
> cat("IQR for Advertising:", iqr_advertising, "\n")  
+ IQR for Advertising: 57.5  
> find_outliers <- function(x) {  
+   Q1 <- quantile(x, 0.25, na.rm = TRUE)  
+   Q3 <- quantile(x, 0.75, na.rm = TRUE)  
+   IQR_val <- Q3 - Q1  
+   lower_bound <- Q1 - 1.5 * IQR_val  
+   upper_bound <- Q3 + 1.5 * IQR_val  
+   outliers <- x[x < lower_bound | x > upper_bound]  
+   return(outliers)  
+ }  
+ outliers_years <- find_outliers(branch_data$Years_X3)  
+ print("Outliers in Years:")  
+ print(outliers_years)  
+
```

