

Faculty of Computing

Year 2 Semester 1 (2025)

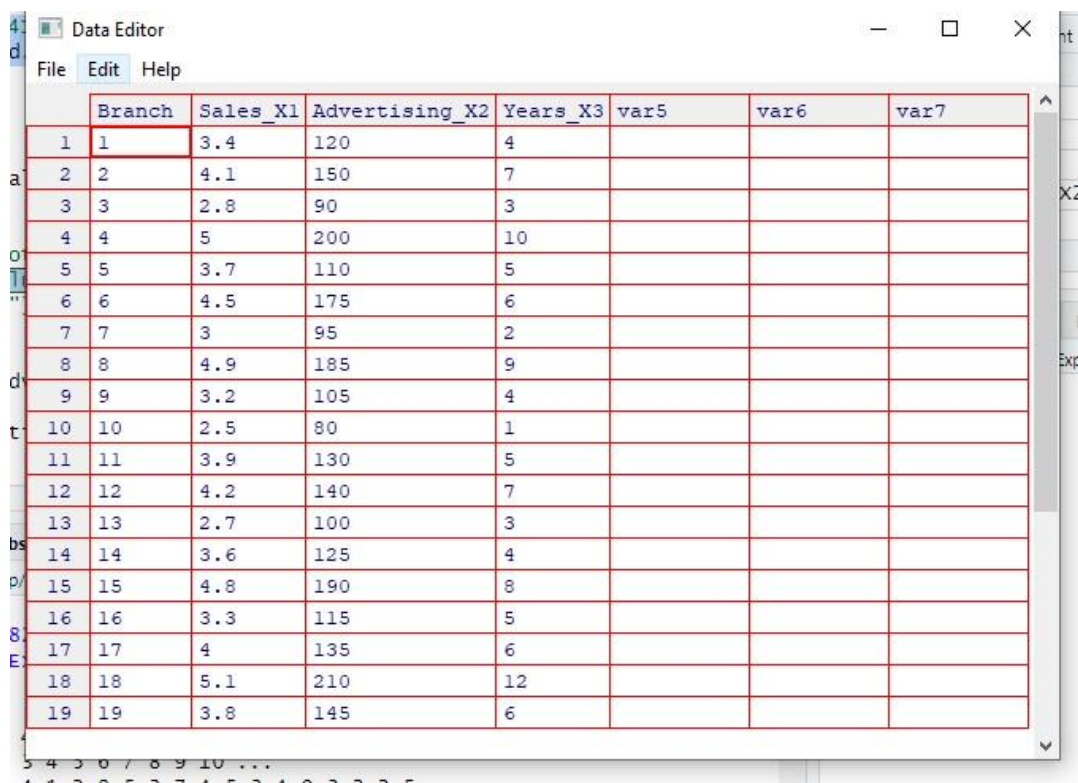
IT2120 - Probability and Statistics

Lab Sheet 04

Exercise

Instructions: Create a folder in your desktop with your registration number (Eg: "IT....."). You need to save the R script file and take screenshots of the command prompt with answers and save it in a word document inside the folder. Save both R script file and word document with your registration number (Eg: "IT....."). After you finish the exercise, zip the folder and upload the zip file to the submission link.

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



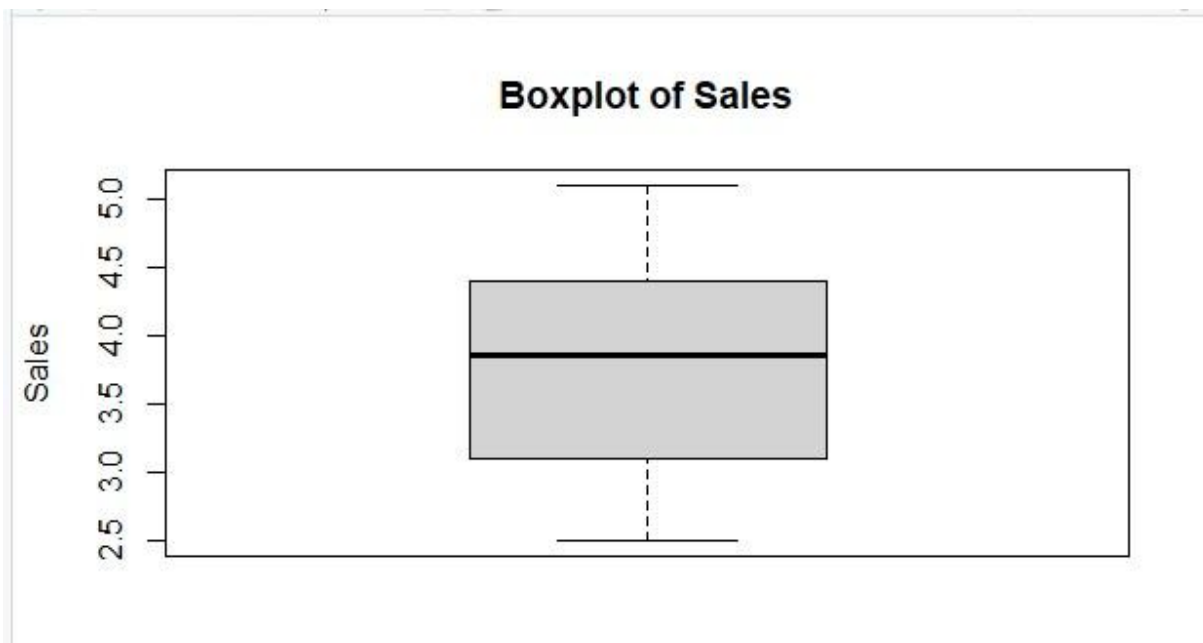
	Branch	Sales_X1	Advertising_X2	Years_X3	var5	var6	var7
1	1	3.4	120	4			
2	2	4.1	150	7			
3	3	2.8	90	3			
4	4	5	200	10			
5	5	3.7	110	5			
6	6	4.5	175	6			
7	7	3	95	2			
8	8	4.9	185	9			
9	9	3.2	105	4			
10	10	2.5	80	1			
11	11	3.9	130	5			
12	12	4.2	140	7			
13	13	2.7	100	3			
14	14	3.6	125	4			
15	15	4.8	190	8			
16	16	3.3	115	5			
17	17	4	135	6			
18	18	5.1	210	12			
19	19	3.8	145	6			

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

```
> str(branch_data)
'data.frame': 30 obs. of 4 variables:
 $ Branch      : num  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: num  120 150 90 200 110 175 95 185 105 80 ...
 $ Years_X3    : num  4 7 3 10 5 6 2 9 4 1 ...
> |
```

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

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



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

```

> fivenum(branch_data$Advertising_X2)
[1] 80.0 100.0 132.5 160.0 210.0
>
> IQR(branch_data$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.

```

> find_outliers <- function(x) {
+   Q1 <- quantile(x, 0.25)
+   Q3 <- quantile(x, 0.75)
+   IQR_value <- IQR(x)
+
+   lower_bound <- Q1 - 1.5 * IQR_value
+   upper_bound <- Q3 + 1.5 * IQR_value
+
+   outliers <- x[x < lower_bound | x > upper_bound]
+
+   return(outliers)
+ }
> outliers_years <- find_outliers(branch_data$Years_X3)
> print(outliers_years)
numeric(0)

```