



Faculty of Computing

Year 2 Semester 1 (2025)

IT2120 - Probability and Statistics

Lab Sheet 04

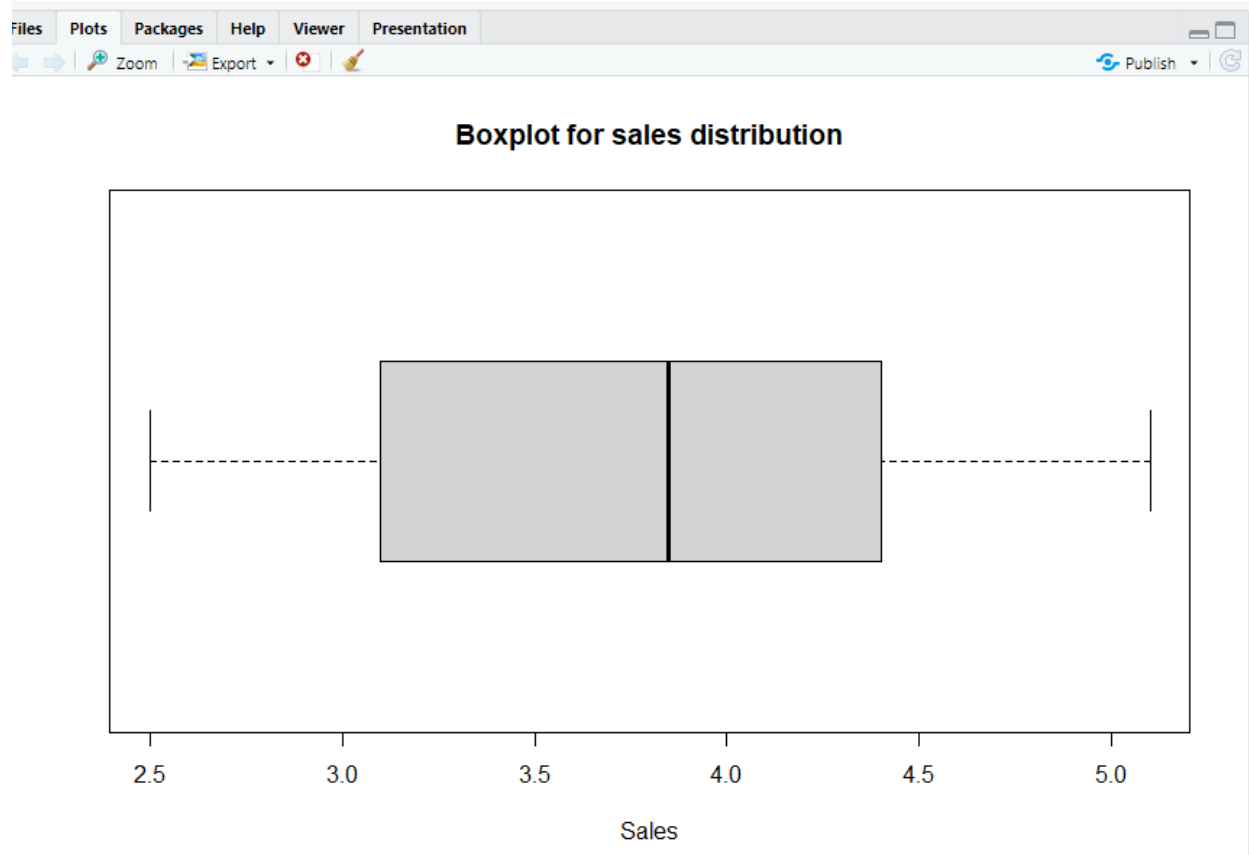
IT24404248

| | 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)

```
> ##Question 02
> 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 ...
>
> sapply(branch_data, class)
      Branch      Sales_X1 Advertising_X2      Years_X3
      "numeric"    "numeric"    "numeric"    "numeric"
```

3)



4)

```
> ##Q4  
> quantile(Advertising_X2)  
 0%   25%   50%   75%  100%  
80.00 101.25 132.50 158.75 210.00  
>  
> IQR(Advertising_X2)  
[1] 57.5  
> |
```

5)

```
> ##Q5
> find_outliers <- function(x) {
+   Q1 <- quantile(x, 0.25)
+   Q3 <- quantile(x, 0.75)
+   IQR <- Q3 - Q1
+
+   lower_bound <- Q1 - 1.5 * IQR
+   upper_bound <- Q3 + 1.5 * IQR
+
+   outliers <- x[x < lower_bound | x > upper_bound]
+
+   return(outliers)
+ }
>
> find_outliers(Years_X3)
numeric(0)
> |
```