Sri Lanka Institute of Information Technology

Lab Submission
<Lab sheet 04>

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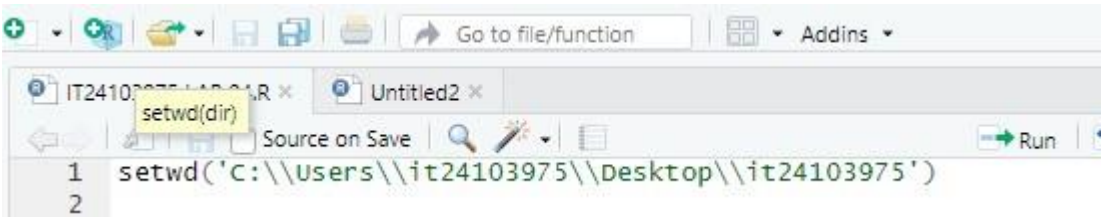
Discrete Mathematics | IT1160

B.Sc. (Hons) in Information Technology

1)




```
> setwd('C:\\Users\\it24103975\\Desktop\\it24103975')
>
```

```
# 1. Import the dataset
branch_data <- read.table("Exercise.txt", header = TRUE, sep = ",")
print("Dataset Imported Successfully")
print(head(branch_data))
```

```
> 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
>
```

2)

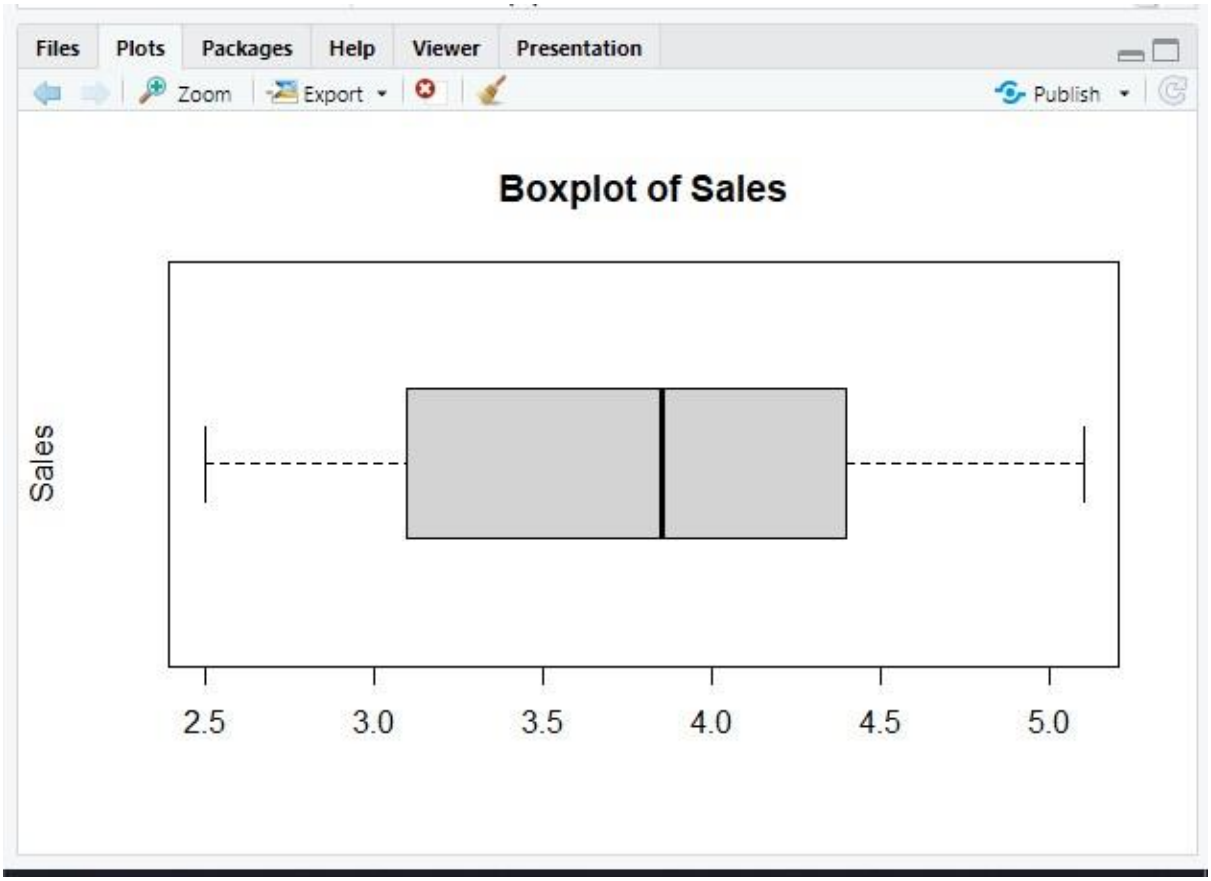
```r
# 2. Identify variable types and scales
str(branch_data)
# Interpretation:
# Branch: Numeric/ID - Nominal scale (categorical identifiers)
# Sales_X1: Numeric - Ratio scale (continuous, meaningful zero)
# Advertising_X2: Numeric - Ratio scale
# Years_X3: Numeric/Integer - Ratio scale
```

```
> 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 ...
> # Interpretation:
> # Branch: Numeric/ID - Nominal scale (categorical identifiers)
> # Sales_X1: Numeric - Ratio scale (continuous, meaningful zero)
> # Advertising_X2: Numeric - Ratio scale
> # Years_X3: Numeric/Integer - Ratio scale
>
```

3)

```r
# 3. Boxplot for Sales (Sales_X1)
boxplot(branch_data$Sales_X1, main = "Boxplot of Sales", ylab = "Sales",
        outline = TRUE, outpch = 8, horizontal = TRUE)
```

```
> # 3. Boxplot for Sales (Sales_X1)
> boxplot(branch_data$Sales_X1, main = "Boxplot of Sales", ylab = "Sales",
+         outline = TRUE, outpch = 8, horizontal = TRUE)
>
```



4)

```
# 4. Five number summary and IQR for Advertising_X2
summary(branch_data$Advertising_X2)
iqr_advertising <- IQR(branch_data$Advertising_X2)
cat("IQR for Advertising:", iqr_advertising, "\n")
```

```
> # 4. Five number summary and IQR for Advertising_X2
> 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
```

5)

```
# 5. Function to find outliers in a numeric vector
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)
}

# Check for outliers in Years_X3
outliers_years <- find_outliers(branch_data$Years_X3)
print("Outliers in Years:")
print(outliers_years)
```

```
> # 5. Function to find outliers in a numeric vector
> 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)
+ }
>
> # Check for outliers in Years_X3
> outliers_years <- find_outliers(branch_data$Years_X3)
> print("Outliers in Years:")
[1] "Outliers in Years:"
> print(outliers_years)
integer(0)
>
```