Faculty of Computing Year 2 Semester 1 (2025)

1)

```
> setwd("C:/Users/IT24100623/Desktop/IT24100623")
> getwd()
[1] "C:/Users/IT24100623/Desktop/IT24100623"
>
```

2)

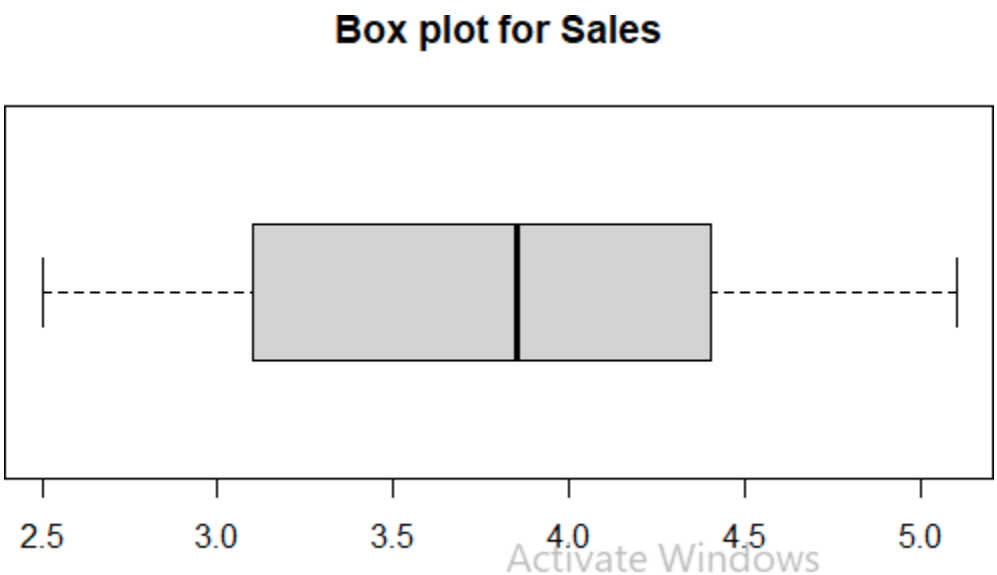
```
> branch_data <-read.table("Exercise.txt",header = TRUE,sep = ",")
```

3)

```
> setwd("C:/Users/IT24100623/Desktop/IT24100623")
> getwd()
[1] "C:/Users/IT24100623/Desktop/IT24100623"
>
> branch_data <- read.table("Exercise.txt", header = TRUE, sep = ",")
> check_variable <- function(x){
+   if (is.numeric(x)) {
+     return("Numeric (Ratio Scale)")
+   } else if (is.factor(x) || is.character(x)) {
+     return("Categorical (Nominal Scale)")
+   } else {
+     return("Other")
+   }
+ }
> sapply(branch_data, check_variable)
                Branch                Sales_X1          Advertising_X2                Years_X3
"Numeric (Ratio Scale)" "Numeric (Ratio Scale)" "Numeric (Ratio Scale)" "Numeric (Ratio Scale)"
>
```

4)

```
> boxplot(branch_data$Sales_X1,main="Box plot for Sales", outline=TRUE, outpch=8, horiz
ontal= TRUE)
>
```



5)

```
> summary(branch_data$Branch)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
   1.00    8.25   15.50   15.50   22.75   30.00
> summary(branch_data$Sales_X1)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  2.500   3.125   3.850   3.790   4.375   5.100
> summary(branch_data$advertising_X2)
Length  Class   Mode
     0   NULL   NULL
> summary(branch_data$Years_X3)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
   1.00    3.25    5.50    5.70    7.75   12.00
> IQR(branch_data$Branch)
[1] 14.5
> IQR(branch_data$Sales_X1)
[1] 1.25
> IQR(branch_data$advertising_X2)
[1] NA
> IQR(branch_data$Years_X3)
[1] 4.5
>
```

6)

```
> get.outliers(branch_data$Branch)
[1] "Upper bound =  44.5"
[1] "Lower bound =  -13.5"
[1] "Outliners =   ,"
> get.outliers(branch_data$Sales_X1)
[1] "Upper bound =  6.25"
[1] "Lower bound =  1.25"
[1] "Outliners =   ,"
> get.outliers(branch_data$advertising_X2)
[1] "Upper bound =  NA"
[1] "Lower bound =  NA"
[1] "Outliners =   ,"
> get.outliers(branch_data$Years_X3)
[1] "Upper bound =  14.5"
[1] "Lower bound =  -3.5"
[1] "Outliners =   ,"
> get.outliers<-function(z){
+   q1<-quantile(z)[2]
+   q3<-quantile(z)[4]
+   iqr<- q3-q1
+
+   ub <-q3+1.5*iqr
+   lb <-q1-1.5*iqr
+
+   print(paste("Upper bound = ",ub))
```

```
+   print(paste("Upper bound = ",ub))
+   print(paste("Lower bound = ",lb))
+   print(paste("Outliners = ",paste(sort(z[z<lb | z>ub]),collapes=",")))
+ }
> get.outliers(branch_data$Branch)
[1] "Upper bound =  44.5"
[1] "Lower bound =  -13.5"
[1] "Outliners =   ,"
> get.outliers(branch_data$Sales_X1)
[1] "Upper bound =  6.25"
[1] "Lower bound =  1.25"
[1] "Outliners =   ,"
> get.outliers(branch_data$advertising_X2)
[1] "Upper bound =  NA"
[1] "Lower bound =  NA"
```

```
[1] "Outliners =   ,"
> get.outliers(branch_data$Sales_X1)
[1] "Upper bound =  6.25"
[1] "Lower bound =  1.25"
[1] "Outliners =   ,"
> get.outliers(branch_data$advertising_X2)
[1] "Upper bound =  NA"
[1] "Lower bound =  NA"
[1] "Outliners =   ,"
> get.outliers(branch_data$Years_X3)
[1] "Upper bound =  14.5"
[1] "Lower bound =  -3.5"
[1] "Outliners =   ,"
>
```