Experiment 5

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Semester: 6 **Subject Code: 20CSP-376**
Subject Name: Data Mining Lab **Date of Performance: 11-04-2023**

1. **Aim/Overview of the practical:** To perform the classification by decision tree induction.

2. **Tools used:** RStudio

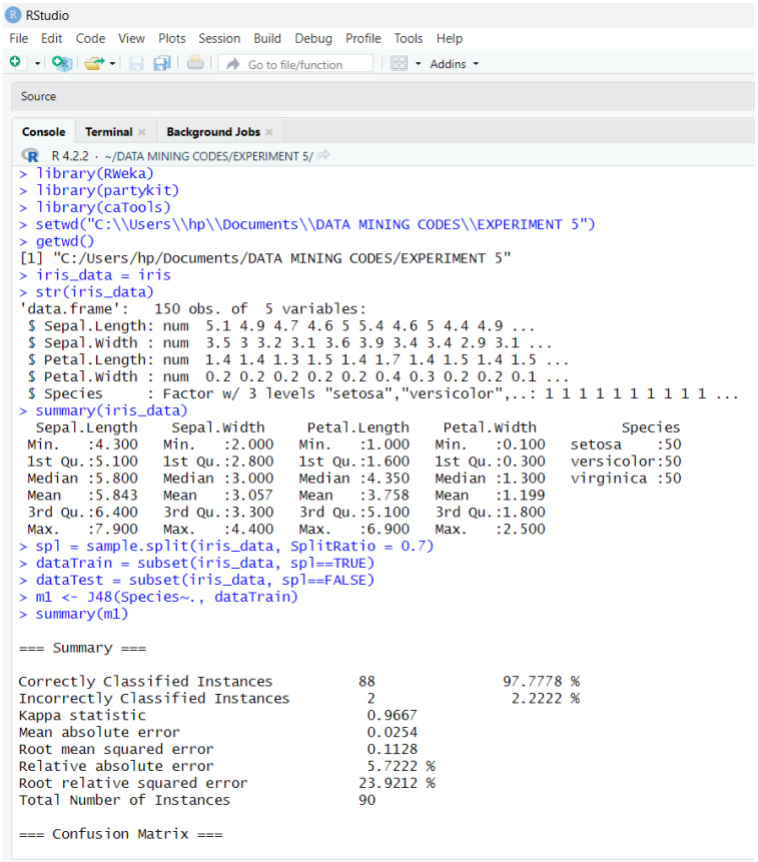
3. **Code:**

```
library(RWeka)
library(partykit)
library(caTools)
setwd("C:\\Users\\hp\\Documents\\DATA MINING
CODES\\EXPERIMENT 5")
getwd()
iris_data = iris
str(iris_data)
summary(iris_data)
spl = sample.split(iris_data, SplitRatio = 0.7)
dataTrain = subset(iris_data, spl==TRUE)
dataTest = subset(iris_data, spl==FALSE)
m1 <- J48(Species~., dataTrain)
summary(m1)
dataTestPred <- predict(m1, newdata = dataTest)
table_matrix <- table(dataTest$Species, dataTestPred)
print(table_matrix)
accuracy_Test <- sum(diag(table_matrix)) / sum(table_matrix)
cat("Test Accuracy is: ", accuracy_Test)
```

```
pdf("Iris_decision_plot.pdf", paper="a4")
plot(m1, type="simple")
dev.off()
```

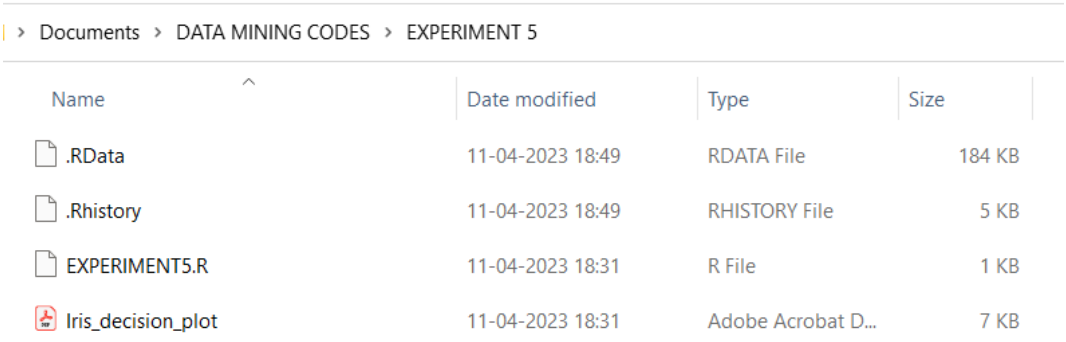
4. **Output:**

RStudio:

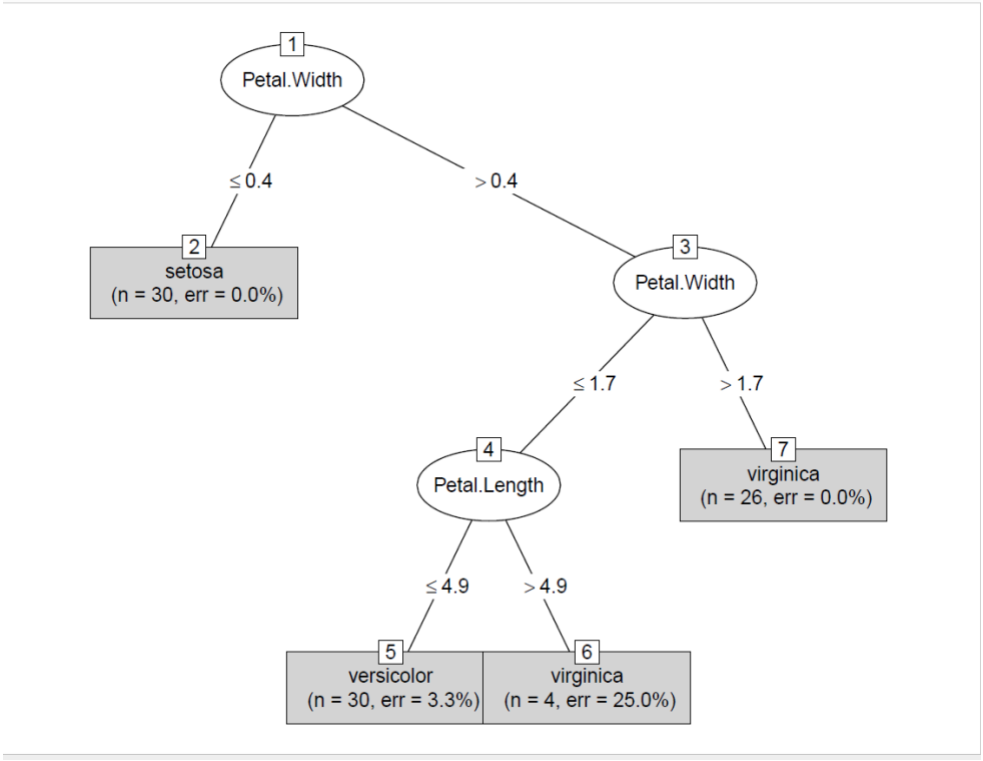


```
> library(RWeka)
> library(partykit)
> library(caTools)
> setwd("C:\\Users\\hp\\Documents\\DATA MINING CODES\\EXPERIMENT 5")
> getwd()
[1] "C:/Users/hp/Documents/DATA MINING CODES/EXPERIMENT 5"
> iris_data = iris
> str(iris_data)
'data.frame':   150 obs. of  5 variables:
 $ Sepal.Length: num  5.1 4.9 4.7 4.6 5 5.4 4.6 5 4.4 4.9 ...
 $ Sepal.Width : num  3.5 3 3.2 3.1 3.6 3.9 3.4 3.4 2.9 3.1 ...
 $ Petal.Length: num  1.4 1.4 1.3 1.5 1.4 1.7 1.4 1.5 1.4 1.5 ...
 $ Petal.Width : num  0.2 0.2 0.2 0.2 0.2 0.4 0.3 0.2 0.2 0.1 ...
 $ Species     : Factor w/ 3 levels "setosa","versicolor",..: 1 1 1 1 1 1 1 1 1 1 ...
> summary(iris_data)
  Sepal.Length    Sepal.Width     Petal.Length    Petal.Width          Species
 Min.   :4.300   Min.   :2.000   Min.   :1.000   Min.   :0.100   setosa    :50
 1st Qu.:5.100   1st Qu.:2.800   1st Qu.:1.600   1st Qu.:0.300   versicolor:50
 Median :5.800   Median :3.000   Median :4.350   Median :1.300   virginica :50
 Mean   :5.843   Mean   :3.057   Mean   :3.758   Mean   :1.199
 3rd Qu.:6.400   3rd Qu.:3.300   3rd Qu.:5.100   3rd Qu.:1.800
 Max.   :7.900   Max.   :4.400   Max.   :6.900   Max.   :2.500
> spl = sample.split(iris_data, SplitRatio = 0.7)
> dataTrain = subset(iris_data, spl==TRUE)
> dataTest = subset(iris_data, spl==FALSE)
> m1 <- J48(Species~., dataTrain)
> summary(m1)

=== Summary ===

Correctly Classified Instances          88               97.7778 %
Incorrectly Classified Instances         2                2.2222 %
Kappa statistic                          0.9667
Mean absolute error                      0.0254
Root mean squared error                  0.1128
Relative absolute error                  5.7222 %
Root relative squared error             23.9212 %
Total Number of Instances               90

=== Confusion Matrix ===

  a  b  c   <-- classified as
 30  0  0 |  a = setosa
  0 29  1 |  b = versicolor
  0  1 29 |  c = virginica
> dataTestPred <- predict(m1, newdata = dataTest)
> table_matrix <- table(dataTest$Species, dataTestPred)
> print(table_matrix)
            dataTestPred
             setosa versicolor virginica
  setosa         18          2         0
  versicolor      0         18         2
  virginica       0          0        20
> accuracy_Test <- sum(diag(table_matrix)) / sum(table_matrix)
> cat("Test Accuracy is: ", accuracy_Test)
Test Accuracy is:  0.9333333
> pdf("Iris_decision_plot.pdf", paper="a4")
> plot(m1, type="simple")
> dev.off()
null device
          1
```

Files stored:



Iris_decision_plot file:



5. Observation:

- Learnt how to use R and create a file in Rstudio.
- Learnt how to install packages in Rstudio.
- Learnt how to plot data into pdf file.
- Learnt how to load dataset iris in Rstudio.
- Learnt the use of RWeka, partykit and caTools libraries.