Ex no: 8 **210701171**

Implement SVM/Decision tree classification techniques

Aim:

To implement SVM/Decision tree classification techniques using RStudio.

Procedure:

a) SVM IN R

```
# Install and load the e1071 package (if not already installed)
install.packages("e1071")
library(e1071)
# Load the iris dataset
data(iris)
# Inspect the first few rows of the dataset
head(iris)
# Split the data into training (70%) and testing (30%) sets
set.seed(123) # For reproducibility
sample_indices <- sample(1:nrow(iris), 0.7 * nrow(iris))
train_data <- iris[sample_indices, ]
test_data <- iris[-sample_indices, ]
# Fit the SVM model
svm_model <- svm(Species ~ ., data = train_data, kernel = "radial")
# Print the summary of the model
summary(svm_model)
# Predict the test set
predictions <- predict(svm_model, newdata = test_data)
# Evaluate the model's performance
confusion_matrix <- table(Predicted = predictions, Actual = test_data$Species)
```

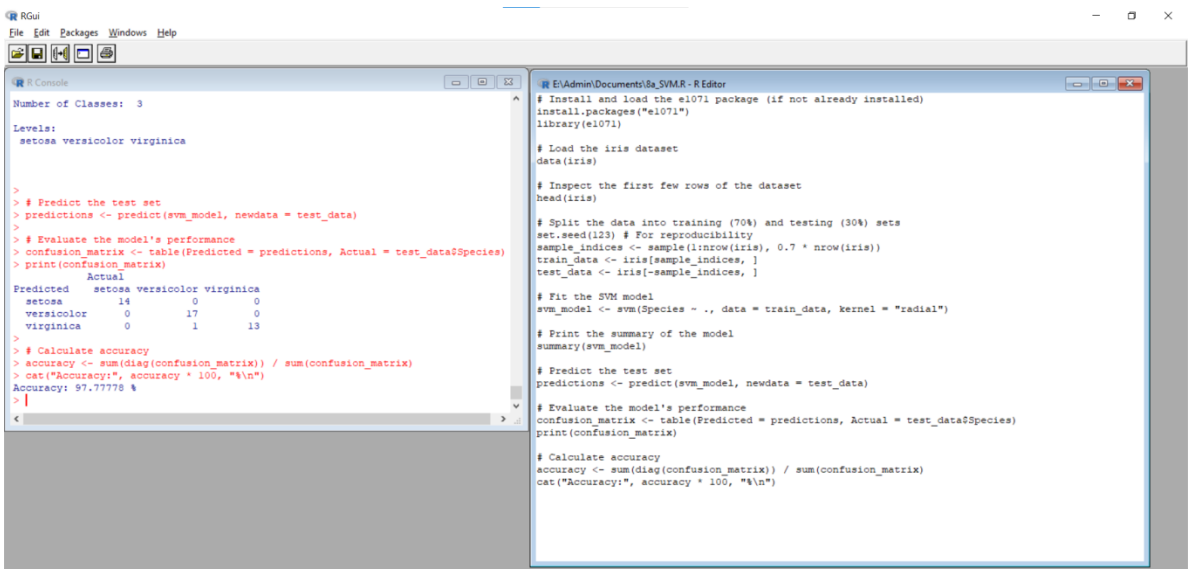
print(confusion_matrix)

Calculate accuracy

accuracy <- sum(diag(confusion_matrix)) / sum(confusion_matrix)

cat("Accuracy:", accuracy * 100, "%\n")

Output:



b) Decision tree in R

Install and load the rpart package (if not already installed)

install.packages("rpart")

library(rpart)

Load the iris dataset

data(iris)

Split the data into training (70%) and testing (30%) sets

set.seed(123) # For reproducibility

sample_indices <- sample(1:nrow(iris), 0.7 * nrow(iris))

train_data <- iris[sample_indices,]

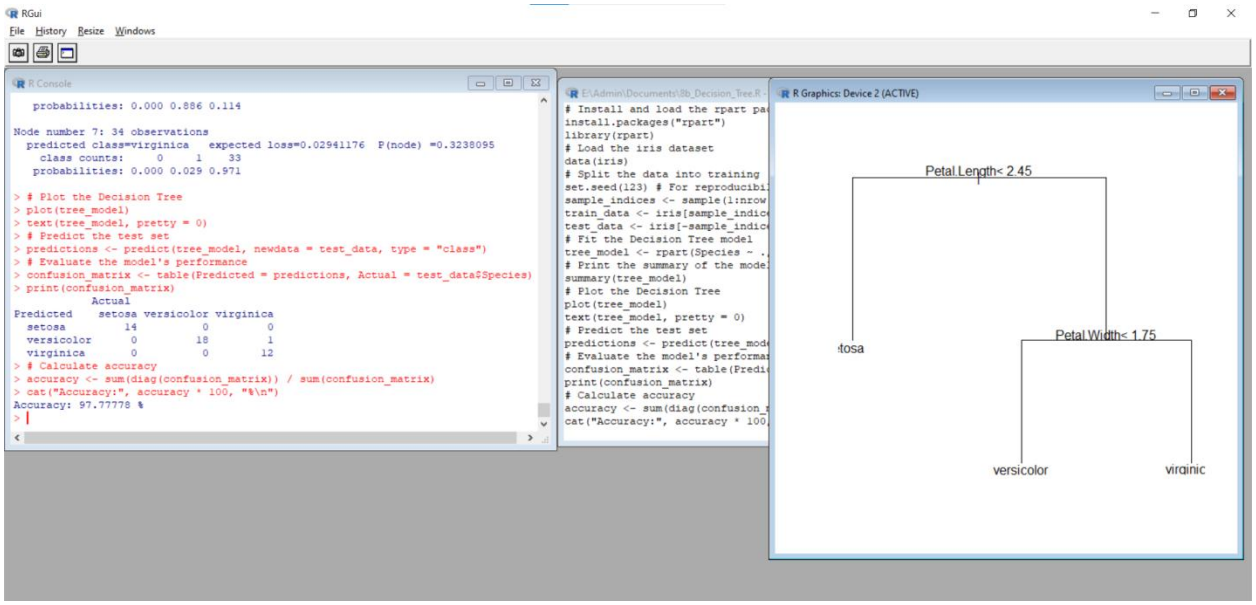
test_data <- iris[-sample_indices,]

Fit the Decision Tree model

tree_model <- rpart(Species ~ ., data = train_data, method = "class")

```
# Print the summary of the model

summary(tree_model)

# Plot the Decision Tree

plot(tree_model)

text(tree_model, pretty = 0)

# Predict the test set

predictions <- predict(tree_model, newdata = test_data, type = "class")

# Evaluate the model's performance

confusion_matrix <- table(Predicted = predictions, Actual = test_data$Species)

print(confusion_matrix)

# Calculate accuracy

accuracy <- sum(diag(confusion_matrix)) / sum(confusion_matrix)

cat("Accuracy:", accuracy * 100, "%\n")
```

Output:



Result:

Thus, SVM/Decision tree classification techniques using R and RStudio was implemented successfully.