

Exp8:

Implement SVM/Decision tree classification techniques

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, ]

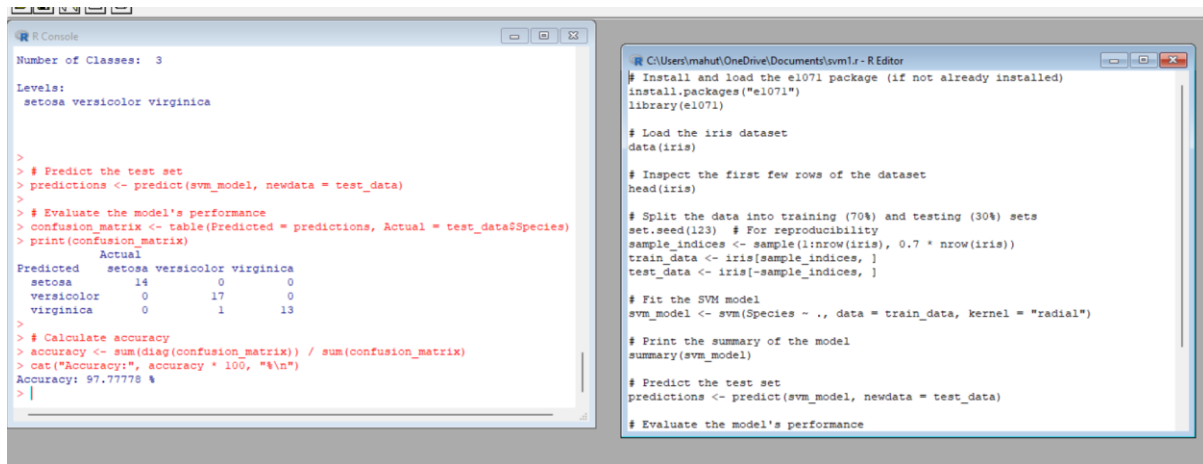
# Fit the SVM model
svm_model <- svm(Species ~ ., data = train_data, kernel = "radial")

# 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")
```



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")
```

