

EXP NO: 8 IMPLEMENT SVM/DECISION TREE CLASSIFICATION TECHNIQUES**a) SVM**

```
# 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:

The screenshot shows the RGui interface with two windows: 'R Console' and 'R Editor'.

R Console Output:

```
> 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)

Call:
svm(formula = Species ~ ., data = train_data, kernel = "radial")

Parameters:
  SVM-Type:  C-classification
 SVM-Kernel: radial
      cost:  1

Number of Support Vectors: 45
( 7 18 20 )

Number of Classes: 3

Levels:
setosa versicolor virginica

> # 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)

      Actual
Predicted setosa versicolor virginica
setosa     14         0         0
versicolor  0         17         0
virginica   0          1        13

> # Calculate accuracy
> accuracy <- sum(diag(confusion_matrix)) / sum(confusion_matrix)
> cat("Accuracy:", accuracy * 100, "%\n")
Accuracy: 97.77778 %
> |
```

R Editor Code:

```
# Install and load the e1071 package (if not already installed)
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# 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")
```

