```
# Installing Packages
install.packages("e1071")
install.packages("caTools")
install.packages("class")

# Loading package
library(e1071)
library(caTools)
library(class)

# Loading data
data(iris)
head(iris)

# Splitting data into train
# and test data
split <- sample.split(iris, SplitRatio = 0.7)
train_cl <- subset(iris, split == "TRUE")
test_cl <- subset(iris, split == "FALSE")

# Feature Scaling
train_scale <- scale(train_cl[, 1:4])
test_scale <- scale(test_cl[, 1:4])

# Fitting KNN Model
# to training dataset
classifier_knn <- knn(train = train_scale,
          test = test_scale,
          cl = train_cl$Species,
          k = 1)
classifier_knn

# Confusiin Matrix
cm <- table(test_cl$Species, classifier_knn)
cm

# Model Evaluation - Choosing K
# Calculate out of Sample error
misClassError <- mean(classifier_knn != test_cl$Species)
print(paste('Accuracy =', 1-misClassError))

# K = 3
classifier_knn <- knn(train = train_scale,
          test = test_scale,
          cl = train_cl$Species,
          k = 3)
misClassError <- mean(classifier_knn != test_cl$Species)
print(paste('Accuracy =', 1-misClassError))

# K = 5
classifier_knn <- knn(train = train_scale,
          test = test_scale,
          cl = train_cl$Species,
          k = 5)
```

```
          k = 5)
misClassError <- mean(classifier_knn != test_cl$Species)
print(paste('Accuracy =', 1-misClassError))

# K = 7
classifier_knn <- knn(train = train_scale,
          test = test_scale,
          cl = train_cl$Species,
          k = 7)
misClassError <- mean(classifier_knn != test_cl$Species)
print(paste('Accuracy =', 1-misClassError))

# K = 15
classifier_knn <- knn(train = train_scale,
          test = test_scale,
          cl = train_cl$Species,
          k = 15)
misClassError <- mean(classifier_knn != test_cl$Species)
print(paste('Accuracy =', 1-misClassError))

# K = 19
classifier_knn <- knn(train = train_scale,
          test = test_scale,
          cl = train_cl$Species,
          k = 19)
misClassError <- mean(classifier_knn != test_cl$Species)
print(paste('Accuracy =', 1-misClassError))
```

```
Installing package into ‘/usr/local/lib/R/site-library’
(as ‘lib’ is unspecified)

also installing the dependency ‘proxy’


Installing package into ‘/usr/local/lib/R/site-library’
(as ‘lib’ is unspecified)

also installing the dependency ‘bitops’


Installing package into ‘/usr/local/lib/R/site-library’
(as ‘lib’ is unspecified)
```

A data.frame: 6 × 5

	Sepal.Length	Sepal.Width	Petal.Length	Petal.Width	Species
	<dbl>	<dbl>	<dbl>	<dbl>	<fct>
1	5.1	3.5	1.4	0.2	setosa
2	4.9	3.0	1.4	0.2	setosa
3	4.7	3.2	1.3	0.2	setosa
4	4.6	3.1	1.5	0.2	setosa
5	5.0	3.6	1.4	0.2	setosa
6	5.4	3.9	1.7	0.4	setosa

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▶ **Levels**:

```
            classifier_knn
             setosa versicolor virginica
  setosa         20          0         0
  versicolor      0         19         1
  virginica       0          3        17
[1] "Accuracy = 0.933333333333333"
```

✓ 23s completed at 7:12 PM