```
> library(e1071)
> library(caTools)
> library(class)
> library(caret)
> head(iris)
  Sepal.Length Sepal.Width Petal.Length Petal.Width Species
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
> split <- sample.split(iris, SplitRatio = 0.8)
> train_cl <- subset(iris, split == "TRUE")
> test_cl <- subset(iris, split == "FALSE")
> nrow(iris)
[1] 150
> nrow(train_cl)
[1] 120
> nrow(test_cl)
[1] 30
> train_scale <- scale(train_cl[, 1:4])
> test_scale <- scale(test_cl[, 1:4])
> classifier_knn <- knn(train = train_scale,test = test_scale,cl = train_cl$Species,k = 3)
> classifier_knn
 [1] setosa     setosa     setosa     setosa     setosa     setosa     setosa     setosa     setosa     setosa
[11] versicolor versicolor versicolor versicolor versicolor versicolor versicolor versicolor versicolor versicolor
[21] virginica  virginica  virginica  virginica  virginica  virginica  virginica  virginica  virginica  virginica
Levels: setosa versicolor virginica
> misClassError <- mean(classifier_knn != test_cl$Species)
> print(paste('Accuracy =', 1-misClassError))
[1] "Accuracy = 0.966666666666667"
> cm <- table(test_cl$Species, classifier_knn)
> cm
            classifier_knn
             setosa versicolor virginica
  setosa         10          0         0
  versicolor      0         10         0
  virginica       0          1         9
```

```
> confusionMatrix(classifier_knn,test_cl$Species)
Confusion Matrix and Statistics

            Reference
Prediction   setosa versicolor virginica
  setosa         10          0         0
  versicolor      0         10         1
  virginica       0          0         9

Overall Statistics

               Accuracy : 0.9667
                 95% CI : (0.8278, 0.9992)
    No Information Rate : 0.3333
    P-Value [Acc > NIR] : 2.963e-13

                  Kappa : 0.95

 Mcnemar's Test P-Value : NA

Statistics by Class:

                     Class: setosa Class: versicolor Class: virginica
Sensitivity                 1.0000            1.0000           0.9000
Specificity                 1.0000            0.9500           1.0000
Pos Pred Value              1.0000            0.9091           1.0000
Neg Pred Value              1.0000            1.0000           0.9524
Prevalence                  0.3333            0.3333           0.3333
Detection Rate              0.3333            0.3333           0.3000
Detection Prevalence        0.3333            0.3667           0.3000
Balanced Accuracy           1.0000            0.9750           0.9500
```