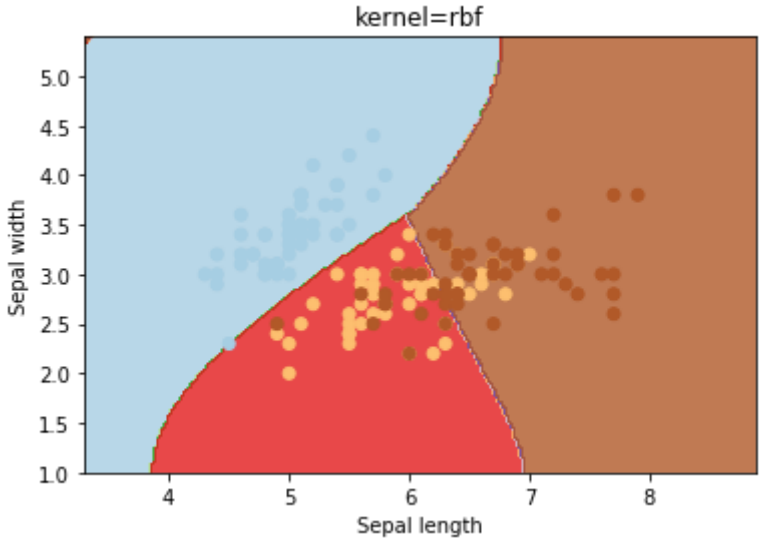
Project Documentation

Ana-Maria-Adina Soare

Grupa 244

Model folosit:

class sklearn.svm.SVC(C = 1.0, kernel = ‘rbf’, gamma = ‘scale’)



3 – Fold Cross Validation:

Împărțirea datelor de antrenare s-a făcut folosind clasa sklearn.model.selection .KFold pe care o pune la dispoziție python. Fiecare fold este constituit din 2 liste, trainData si testData.

```
from sklearn.model_selection import KFold

kf = KFold(n_splits = 3)
kf.get_n_splits(trainData)

for trainIndex, testIndex in kf.split(trainData):
   nr_fold = nr_fold + 1 #current fold

   #trainData and trainLabels for fold nr_fold
   trainData3Cross = trainData[trainIndex]
   trainLabels3Cross = trainLabels[trainIndex]
```

```
#testData and testLabels for fol nr_fold
testData3Cross = trainData[testIndex]
testLabels3Cross = trainLabels[testIndex]
testLabels3Cross = testLabels3Cross.astype(int)

#training the svm classifier on each fold
cf = svm.SVC(gamma = 'scale')
cf.fit(trainData3Cross, trainLabels3Cross)
predictions = cf.predict(testData3Cross)
predictions = predictions.astype(int) #the labels predicted by the classifier


accuracy = (predictions == testLabels3Cross).mean()
sumAccuracy = sumAccuracy + accuracy
print("Accuracy for fold ", nr_fold, ": ", accuracy)
print("Confusion matrix fold ", nr_fold, ": ")
print(confusion_matrix(testLabels3Cross, predictions))
```

- *Accuracy for fold 1 : 0.9622*

Confusion matrix fold 1 :

```
[[1722    4    4   18    6    0    0    0]
 [   7 1463    5    2    2    0    0    0]
 [   3    8  608    0    0    0    6    0]
 [  34    2    0  558    1    0    3    0]
 [   7    0    1    4  387    0    0    0]
 [   0    0    0    1   17    2    0    0]
 [   0    1   19    6    1    0   71    0]
 [  20    0    1    4    2    0    0    0]]
```

- *Accuracy for fold 2 : 0.9556*

Confusion matrix fold 2 :

```
[[1745    2    4   26    5    0    0    0]
 [   7 1451    2    1    1    0    0    0]
 [  10    5  576    0    3    0    4    0]
 [  51    5    0  512    3    0    0    0]
 [   7    4    3    2  411    0    0    0]
 [   0    0    0    4   21    0    0    0]
 [   1    1   21    4    1    0   83    0]
 [  18    3    0    2    1    0    0    0]]
```

- *Accuracy for fold 3 : 0.9626*

Confusion matrix fold 3 :

```
[[1701    4    3   27    0    0    1    0]
 [   5 1464    3    2    2    0    0    0]
 [   5    2  577    0    3    0    4    0]
 [  44    2    0  610    2    0    7    0]
 [   8    3    2    5  387    0    0    0]
 [   0    0    0    3   12    0    0    0]
 [   0    0   17    2    1    0   74    0]
 [  17    0    0    0    1    0    0    0]]
```

Mean Accuracy: 0.9601