knn_using_sklearn

September 28, 2016

1 k-Nearest Neighbour Classifier using sklearn

```
In [1]: %matplotlib inline
        import pandas as pd
        import numpy as np
        from matplotlib import pyplot as plt
        from sklearn.neighbors import KNeighborsClassifier
        from sklearn.metrics import accuracy_score, confusion_matrix
```

```
In [2]: #Loading data and preprocessing
        url='http://archive.ics.uci.edu/ml/machine-learning-databases/iris/iris.dat
        df=pd.read_csv(url)
        df.columns=['sepal_length','sepal_width','petal_length','petal_width','flow
        df['flower_type'] = df['flower_type'].astype('category')
        df.flower_type = df.flower_type.cat.rename_categories([0,1,2])
        D=df.values


        # Get the labelled set
        c1=D[:20,:]; c2=D[50:70,:];  c3=D[100:120,:]
        trainSet = np.concatenate((c1,c2,c3),axis=0)

        # Get the testing set
        c1 = D[21:50,:]; c2=D[71:100,:];  c3=D[121:,:]
        testSet = np.concatenate((c1,c2,c3),axis=0)

        xTrain=trainSet[:,:-1]; yTrain=trainSet[:,-1]
        xTest=testSet[:,:-1]; yTest=testSet[:,-1]
```

```
In [3]: # create a knn classifier with K=3
        clf = KNeighborsClassifier(n_neighbors=3)
        clf.fit(xTrain, yTrain.astype(int))

Out[3]: KNeighborsClassifier(algorithm='auto', leaf_size=30, metric='minkowski',
                   metric_params=None, n_jobs=1, n_neighbors=3, p=2,
                   weights='uniform')
```

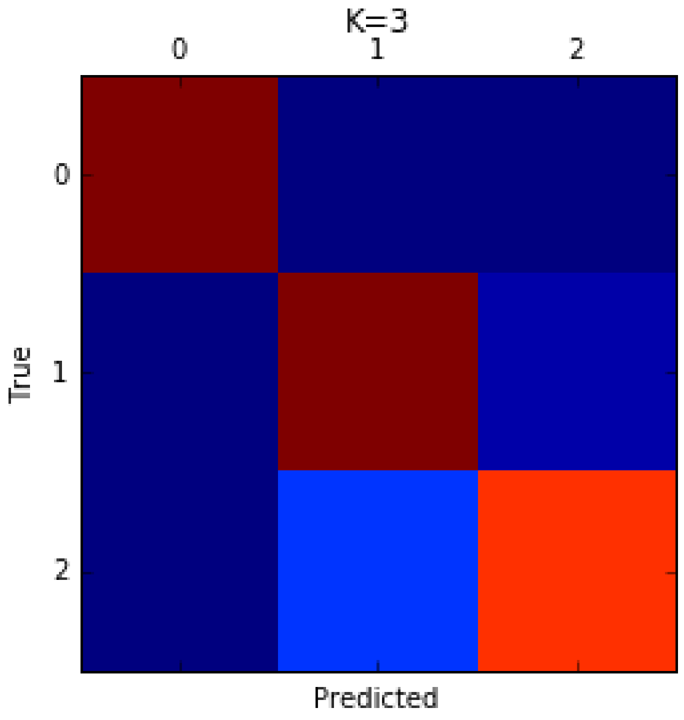
```
In [4]: # Make predictions
        yPred=clf.predict(xTest)
        acc=accuracy_score(yTest.astype(int), yPred.astype(int))
        print('Accuracy with 3 neighbours: ',acc)
```

```
Accuracy with 3 neighbours:  0.93023255814
```

```
In [5]: def plot_conf_mat(lTrue, lPred, title):
            """ A function for plotting the confusion matrix given true and predict
            cm = confusion_matrix(lTrue.astype(int), lPred.astype(int))
            print(cm)
            fig = plt.figure()
            ax = fig.add_subplot(111)
            cax = ax.matshow(cm)
            plt.title(title)
            plt.xlabel('Predicted')
            plt.ylabel('True')
            plt.show()
```

```
In [6]: plot_conf_mat(yTest, yPred, 'K=3')
```

```
[[28  0  0]
 [ 0 28  1]
 [ 0  5 24]]
```


K=3
True
Predicted