lab 1

1.1

题目

> 编写程序，利用classify0函数（groups, labels, k=3）；测试[0,0]、[0.8,0.7]等点的类别

代码

MY_KNN.py文件代码

```
from cProfile import label
from tokenize import group
from numpy import *
import operator

def creatDataSet():
    group = array([[1.0, 1.1], [1.0, 1.0], [0, 0], [0, 0.1]])
    labels = ['A','A','B','B']
    return group,labels

def classify0(inX,dataSet,labels,k):
    dataSetSize = dataSet.shape[0]
    diffMat = tile(inX,(dataSetSize,1)) - dataSet
    sqDiffMat = diffMat ** 2
    sqDistances = sqDiffMat.sum(axis=1)
    distances = sqDistances ** 0.5
    sortedDistIndicies = distances.argsort()
    classCount = {}
    for i in range(k):
        voteLabel = labels[sortedDistIndicies[i]]
        classCount[voteLabel] = classCount.get(voteLabel,0) +1
    sortedClassCount = sorted(classCount.items(),
                              key=operator.itemgetter(1),reverse=True)
    return sortedClassCount[0][0]
```

test.py文件代码

```
import MY_KNN
import numpy as np

group,labels =MY_KNN.creatDataSet()
print(MY_KNN.classify0([0,0],group,labels,3))
print(MY_KNN.classify0([0.8,0.7],group,labels,3))
```

运行结果截图

1.2

题目

> 写程序，利用classify0函数（k=3）；系统性的实现datingTestSet2.txt中10% 数据的测试，并打印出结果；

代码

KNN.py文件代码

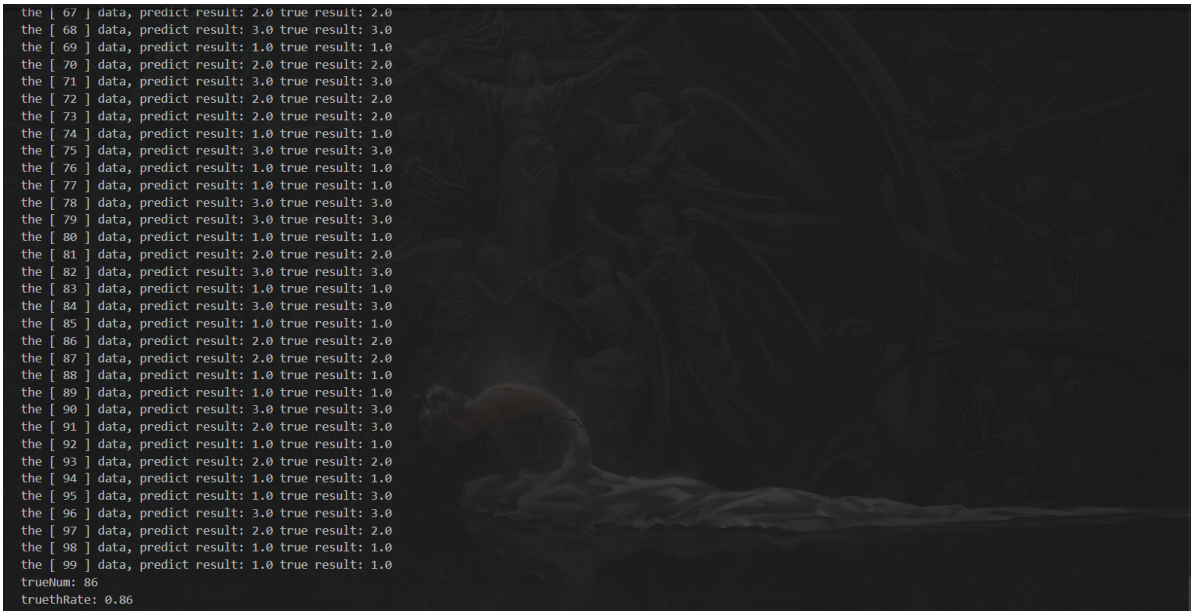
```
from cProfile import label
from tokenize import group
from numpy import *
import operator
import numpy as np

def creatDataSet():
    group = np.loadtxt('train.txt',usecols=(0,1,2))
    labels = np.loadtxt('train.txt',usecols=(3))
    #group = array([[1.0, 1.1], [1.0, 1.0], [0, 0], [0, 0.1]])
    #labels = ['A','A','B','B']
```

```
    return group,labels

def classify0(inX,dataSet,labels,k):
    dataSetSize = dataSet.shape[0]
    diffMat = tile(inX,(dataSetSize,1)) - dataSet
    sqDiffMat = diffMat ** 2
    sqDistances = sqDiffMat.sum(axis=1)
    distances = sqDistances ** 0.5
    sortedDistIndicies = distances.argsort()
    classCount = {}
    for i in range(k):
        voteLabel = labels[sortedDistIndicies[i]]
        classCount[voteLabel] = classCount.get(voteLabel,0) +1
    sortedClassCount = sorted(classCount.items(),
                              key=operator.itemgetter(1),reverse=True)
    return sortedClassCount[0][0]
```

test.py文件代码

```
import KNN
import numpy as np

group,labels = KNN.creatDataSet()
print("group:",group)
print("labels:",labels)
print("testData:",np.loadtxt("test.txt",usecols=(0,1,2)))
testData = np.loadtxt("test.txt",usecols=(0,1,2)).reshape(100,-1)
trueData = np.loadtxt("test.txt",usecols=(3))
print("testData:",testData[0])
trueNum = 0
for i in range(100):
    print("the [",i,"] data,","predict
result:",KNN.classify0(testData[i],group,labels,3),"true result:",trueData[i])
    if(KNN.classify0(testData[i],group,labels,3) == trueData[i]):
        trueNum += 1
print("trueNum:",trueNum)
print("truethRate:",trueNum/100)
```

运行结果



注

如果要运行1.2文件的话最好确保目录下没有中文，如果有中文的话可能导致`np.loadtxt`报错

并且请手动把原来的data划分成900个数据的train和100个数据的test文件