

In [4]:

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import numpy as np
import math
import csv
import pdb
def read_data(filename):

    with open(filename,'r') as csvfile:
        datareader = csv.reader(csvfile)
        metadata = next(datareader)
        traindata=[]
        for row in datareader:
            traindata.append(row)

    return (metadata, traindata)

def splitDataset(dataset, splitRatio):
    trainSize = int(len(dataset) * splitRatio)
    trainSet = []
    testset = list(dataset)
    i=0
    while len(trainSet) < trainSize:
        trainSet.append(testset.pop(i))
    return [trainSet, testset]

def classify(data,test):

    total_size = data.shape[0]
    print("\n")
    print("training data size=",total_size)
    print("test data size=",test.shape[0])

    countYes = 0
    countNo = 0
    probYes = 0
    probNo = 0
    print("\n")
    print("target    count    probability")

    for x in range(data.shape[0]):
        if data[x,data.shape[1]-1] == 'yes':
            countYes +=1
        if data[x,data.shape[1]-1] == 'no':
            countNo +=1

    probYes=countYes/total_size
    probNo= countNo / total_size

    print('Yes', "\t", countYes, "\t", probYes)
    print('No', "\t", countNo, "\t", probNo)

    prob0 =np.zeros((test.shape[1]-1))
    prob1 =np.zeros((test.shape[1]-1))
    accuracy=0
    print("\n")
    print("instance prediction  target")

    for t in range(test.shape[0]):
        for k in range (test.shape[1]-1):

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count1=count0=0
for j in range (data.shape[0]):
    #how many times appeared with no
    if test[t,k] == data[j,k] and data[j,data.shape[1]-1]=='no':
        count0+=1
    #how many times appeared with yes
    if test[t,k]==data[j,k] and data[j,data.shape[1]-1]=='yes':
        count1+=1
prob0[k]=count0/countNo
prob1[k]=count1/countYes

probno=probNo
probyes=probYes
for i in range(test.shape[1]-1):
    probno=probno*prob0[i]
    probyes=probyes*prob1[i]
if probno>probyes:
    predict='no'
else:
    predict='yes'

print(t+1,"\t",predict,"\t",test[t,test.shape[1]-1])
if predict == test[t,test.shape[1]-1]:
    accuracy+=1
final_accuracy=(accuracy/test.shape[0])*100
print("accuracy",final_accuracy,"%")
return

metadata,traindata= read_data("tennis.csv")
splitRatio=0.6
trainingset, testset=splitDataset(traindata, splitRatio)
training=np.array(trainingset)
print("\n The Training data set are:")
for x in trainingset:
    print(x)

testing=np.array(testset)
print("\n The Test data set are:")
for x in testing:
    print(x)
classify(training,testing)

```

The Training data set are:

```
['sunny', 'hot', 'high', 'Weak', 'no']
['sunny', 'hot', 'high', 'Strong', 'no']
['overcast', 'hot', 'high', 'Weak', 'yes']
['rainy', 'mild', 'high', 'Weak', 'yes']
['rainy', 'cool', 'normal', 'Weak', 'yes']
['rainy', 'cool', 'normal', 'Strong', 'no']
['overcast', 'cool', 'normal', 'Strong', 'yes']
['sunny', 'mild', 'high', 'Weak', 'no']
```

The Test data set are:

```
['sunny' 'cool' 'normal' 'Weak' 'yes']
['rainy' 'mild' 'normal' 'Weak' 'yes']
['sunny' 'mild' 'normal' 'Strong' 'yes']
['overcast' 'mild' 'high' 'Strong' 'yes']
['overcast' 'hot' 'normal' 'Weak' 'yes']
['rainy' 'mild' 'high' 'Strong' 'no']
```

training data size= 8

test data size= 6

target	count	probability
Yes	4	0.5
No	4	0.5

instance	prediction	target
1	no	yes
2	yes	yes
3	no	yes
4	yes	yes
5	yes	yes
6	no	no

accuracy 66.66666666666666 %

In []: