# 朴素贝叶斯Matlab实现

**利用朴素贝叶斯算法完成下面习题：**

使用朴素贝叶斯分类预测未知样本的类标号。给定Playtennis的训练样本集见下表。

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Day | Outlook | Temperature | Humidity | Wind | Playtennis |
| 1 | Sunny | Hot | High | Weak | No |
| 2 | Sunny | Hot | High | Strong | No |
| 3 | Overcast | Hot | High | Weak | Yes |
| 4 | Rain | Mild | High | Weak | Yes |
| 5 | Rain | Cool | Normal | Weak | Yes |
| 6 | Rain | Cool | Normal | Strong | No |
| 7 | Overcast | Cool | Normal | Strong | Yes |
| 8 | Sunny | Mild | High | Weak | No |
| 9 | Sunny | Cool | Normal | Weak | Yes |
| 10 | Rain | Mild | Normal | Weak | Yes |
| 11 | Sunny | Mild | Normal | Strong | Yes |
| 12 | Overcast | Mild | High | Strong | Yes |
| 13 | Overcast | Hot | Normal | Weak | Yes |
| 14 | Rain | Mild | High | Strong | No |

要分类的未知样本为

X={Outlook=Sunny，Temperature=Hot，Humidity=High，Wind=Strong}.

**程序**

clc;

clear all;

%% 导入数据

naive\_bayes\_classifier\_input = [ 0,2,0,0,0;

%0,2,0,1,0;

0,2,0,1,0;

1,2,0,0,1;

2,1,0,0,1;

2,0,1,0,1;

2,0,1,1,0;

1,0,1,1,1;

0,1,0,0,0;

0,0,1,0,1;

2,1,1,0,1;

0,1,1,1,1;

1,1,0,1,1;

1,2,1,0,1;

2,1,0,1,0];

%sunuy 0,overcast 1,rain 2

%cool 0,midd 1,hot 2

%high 0,nomal 1

%week 0,strong 1

%no 0,yes 1

%% 贝叶斯

[l,w]=size(naive\_bayes\_classifier\_input);

naive\_bayes\_classifier\_count = zeros(2,w);

%统计各个量的个数,count(1,i):为y=1，第i个决策量为1的个数

for i=1:1:l

for j=1:1:w

if naive\_bayes\_classifier\_input(i,j)==1 && naive\_bayes\_classifier\_input(i,end)==1

naive\_bayes\_classifier\_count(1,j)=naive\_bayes\_classifier\_count(1,j)+1;

elseif naive\_bayes\_classifier\_input(i,j)==1 && naive\_bayes\_classifier\_input(i,end)==0

naive\_bayes\_classifier\_count(2,j)=naive\_bayes\_classifier\_count(2,j)+1;

end

end

end

naive\_bayes\_classifier\_count(2,end)=l-naive\_bayes\_classifier\_count(1,end);

naive\_bayes\_classifier\_testdata = [0,2,0,1,0];

%以未知样本X={Outlook=Sunny，Temperature=Hot，Humidity=High，Wind=Strong}为例

naive\_bayes\_classifier\_answer = [0,0];

naive\_bayes\_classifier\_temp = 1;

for i=1:1:w-1

if naive\_bayes\_classifier\_testdata(i)==1

naive\_bayes\_classifier\_temp=naive\_bayes\_classifier\_temp\*naive\_bayes\_classifier\_count(1,i)/naive\_bayes\_classifier\_count(1,end);

else

naive\_bayes\_classifier\_temp=naive\_bayes\_classifier\_temp\*(1-naive\_bayes\_classifier\_count(1,i)/naive\_bayes\_classifier\_count(1,end));

end

end

naive\_bayes\_classifier\_answer(1)=naive\_bayes\_classifier\_count(1,end)/l\*naive\_bayes\_classifier\_temp;

naive\_bayes\_classifier\_temp = 1;

for i=1:1:w-1

if naive\_bayes\_classifier\_testdata(i)==1

naive\_bayes\_classifier\_temp=naive\_bayes\_classifier\_temp\*naive\_bayes\_classifier\_count(2,i)/naive\_bayes\_classifier\_count(2,end);

else

naive\_bayes\_classifier\_temp=naive\_bayes\_classifier\_temp\*(1-naive\_bayes\_classifier\_count(2,i)/naive\_bayes\_classifier\_count(2,end));

end

end

naive\_bayes\_classifier\_answer(2)=naive\_bayes\_classifier\_count(2,end)/l\*naive\_bayes\_classifier\_temp;

naive\_bayes\_classifier\_answer

if naive\_bayes\_classifier\_answer(1)>naive\_bayes\_classifier\_answer(2)

disp("打球")

else

disp("不打球")

end

**测试结果**

**answer =**

**0.0220 0.1029**

**不打球**

**>>**