代码：

```
import matplotlib.pyplot as plt
import numpy as np
from sklearn.metrics import roc_curve

def insert_list(n,data,list):
    if(n>=len(list)):
        list.extend([[]]*(n-len(list)+1))
    list[n].append(data)
    return list

y_true=np.asarray([[0,0,1],[0,1,0],[1,0,0],[0,0,1],[1,0,0],[0,1,0],[0
,1,0],[0,1,0],[0,0,1],[0,1,0]])
y_pred=np.asarray([[0.1,0.2,0.7],[0.1,0.6,0.3],[0.5,0.2,0.3],[0.1,0.1
,0.8],[0.4,0.2,0.4],[0.6,0.3,0.1],[0.4,0.2,0.4],[0.4,0.1,0.5],[0.1,0.
1,0.8],[0.1,0.8,0.1]])
aa=np.asarray([0.1,0.2,0.3,0.4,0.5,0.6,0.7,0.8])

tpr=[]
fpr=[]

tp = []
fn = []
fp = []
tn = []
n=0

for j in range(0,3):
    yt = y_true[:, j]
    yp = y_pred[:, j]
    n=0
    for a in aa:
        TP=0
        FP=0
        FN=0
        TN=0
        for i in range(0,10):
            if (yt[i]==1) and (yp[i]>=a):
                TP=TP+1
            elif (yt[i]==1) and (yp[i]<a):
                FN=FN+1
            elif (yt[i]==0) and (yp[i]>=a):
                FP=FP+1
            elif (yt[i]==0) and (yp[i]<a):
```

```
                TN=TN+1
            tp=insert_list(n,TP,tp)
            tn=insert_list(n,TN,tn)
            fn=insert_list(n,FN,fn)
            fp=insert_list(n,FP,fp)
            n+=1
        plt.figure(figsize=(5,5))
        titlestr="ROC curve "+"NO."+str(j+1)
        fpr_j,tpr_j,th=roc_curve(yt,yp)
        plt.title(titlestr, fontsize=14)
        plt.plot(fpr_j, tpr_j)
        plt.plot(fpr_j,tpr_j,'ro')
        plt.ylabel('TPR', fontsize=14)
        plt.xlabel('FPR', fontsize=14)
        plt.show()

    for i in range(len(tp)):
        tp_i=tp[i]
        fp_i = fp[i]
        tn_i = tn[i]
        fn_i = fn[i]
        tp_a=(tp_i[0]+tp_i[1]+tp_i[2])
        fn_a=(fn[i][0] + fn[i][1] + fn[i][2])
        tn_a=(tn[i][0] + tn[i][1] + tn[i][2])
        fp_a=(fp[i][0] + fp[i][1] + fp[i][2])
        TPR=float(tp_a)/(tp_a+fn_a)
        FPR=float(fp_a)/(fp_a+tn_a)
        tpr.append(TPR)
        fpr.append(FPR)
    plt.figure(figsize=(5,5))
    plt.title("average ROC curve in micro",fontsize=14)
    plt.plot(fpr,tpr)
    plt.plot(fpr,tpr,'ro')
    plt.ylabel('TPR', fontsize=14)
    plt.xlabel('FPR', fontsize=14)
    plt.show()
```