import matplotlib.pyplot as plt  
import numpy as np  
pp = [['T', 9], ['T', 0.7],['N', 0.65], ['T', 0.6], ['N', 0.5],['N', 0.4], ['N', 0.4],['T', 0.4],  
 ['N', 0.35],['N', 0.2]]  
aa = [0.9, 0.7, 0.65,0.6,0.5,0.4, 0.4,0.4, 0.35,0.2]  
recall=[]  
precision=[]  
TPR=[]  
FPR=[]  
for a in aa:  
 tp=0  
 fn=0  
 fp=0  
 tn=0  
 x=0  
 y=0  
 for p in pp:  
 if(p[0]=='T')and(p[1]>=a):  
 tp=tp+1  
 elif (p[0]=='T')and(p[1]<a):  
 fn=fn+1  
 elif(p[0]=='N')and(p[1]>=a):  
 fp=fp+1  
 elif(p[0]=='N')and(p[1]<a):  
 tn=tn+1  
 x=float(tp)/(tp+fn)  
 if tp + fp == 0:  
 y = 0 else:  
 y = float(tp) / (tp + fp)  
 fpr=float(fp)/(tn+fp)  
  
 recall.append(x)  
 precision.append(y)  
 TPR.append(x)  
 FPR.append(fpr)  
plt.figure(figsize=(5,5))  
plt.title('precision-recall curve',fontsize=16)  
plt.plot(recall,precision)  
plt.plot(recall,precision,'ro')  
plt.ylabel('Precisoin',fontsize=16)  
plt.xlabel('Recall',fontsize=16)  
plt.grid(True) plt.show()

%ROC