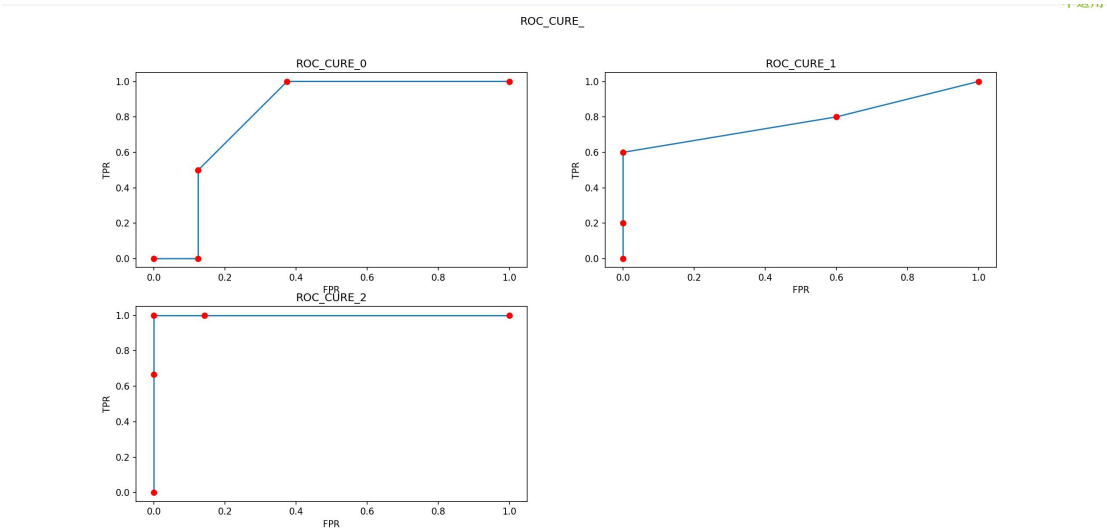
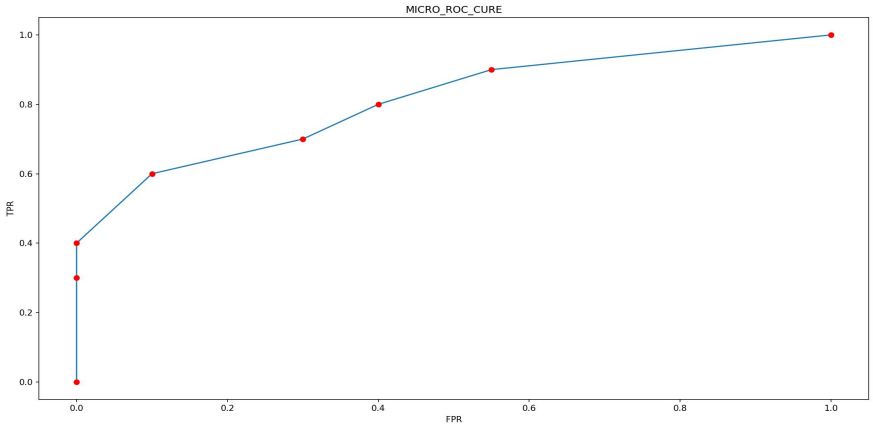
```
import numpy as np
import matplotlib.pyplot as plt
from sklearn.metrics import roc_curve, roc_auc_score, auc

y_lab = np.array([[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_pre = np.array([[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]])

plt.figure(figsize=(12, 12))
fprs = []
tprs = []
for i in range(3):
    fpr, tpr, _ = roc_curve(y_lab[:, i], y_pre[:, i])
    auc1 = roc_auc_score(y_lab[:, i], y_pre[:, i])
    auc2 = auc(fpr, tpr)
    fprs.append(fpr)
    tprs.append(tpr)
    plt.subplot(2, 2, i+1)
    plt.plot(fpr, tpr)
    plt.plot(fpr, tpr, 'ro')
    title = 'ROC_CURE_' + str(i)
    plt.title(title)
    plt.xlabel('FPR')
    plt.ylabel('TPR')
plt.suptitle('ROC_CURE_')
plt.show()
```

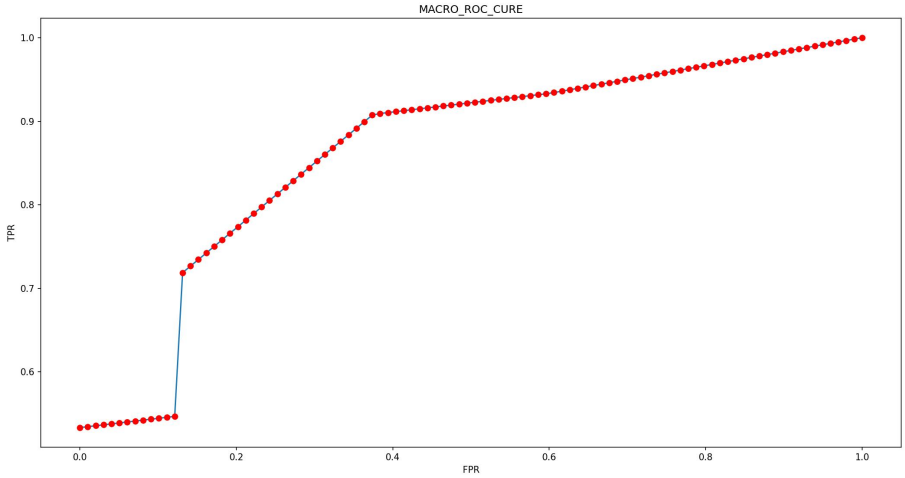



```
#micro_roc
y_lab1 = y_lab.reshape((30, 1))
y_pre1 = y_pre.reshape((30, 1))
```

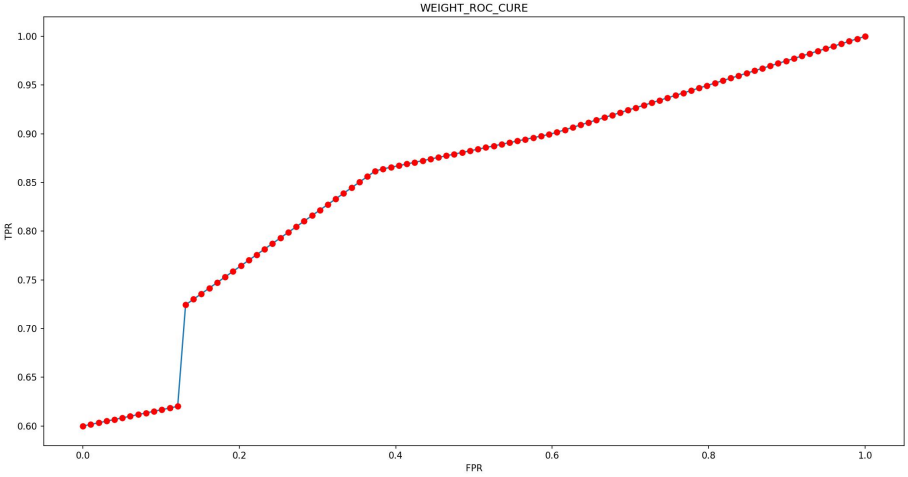
```
fpr, tpr, _ = roc_curve(y_lab1, y_pre1)
plt.plot(fpr, tpr)
plt.plot(fpr, tpr, 'ro')
plt.title('MICRO_ROC_CURE')
plt.xlabel('FPR')
plt.ylabel('TPR')
plt.show()
```




```
#macro_cro
fpr_grid = np.linspace(0.0, 1.0, 100)
mean_tpr = np.zeros_like(fpr_grid)
for i in range(3):
    mean_tpr += np.interp(fpr_grid, fprs[i], tprs[i])
mean_tpr /= 3
plt.plot(fpr_grid, mean_tpr)
plt.plot(fpr_grid, mean_tpr, 'ro')
plt.title('MACRO_ROC_CURE')
plt.xlabel('FPR')
plt.ylabel('TPR')
plt.show()
```




```
#weight_roc
nums = np.zeros(3)
for i in range(10):
    for j in range(3):
        if y_lab[i][j] == 1:
            nums[j] = nums[j] + 1
ratio = nums / 10
ave_tpr = np.zeros_like(fpr_grid)
for i in range(3):
    ave_tpr += ratio[i]*np.interp(fpr_grid, fprs[i], tprs[i])
plt.plot(fpr_grid, ave_tpr)
plt.plot(fpr_grid, ave_tpr, 'ro')
plt.title('WEIGHT_ROC_CURE')
plt.xlabel('FPR')
plt.ylabel('TPR')
plt.show()
```


WEIGHT_ROC_CURE
TPR
FPR
1.00
0.95
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.0
0.2
0.4
0.6
0.8
1.0