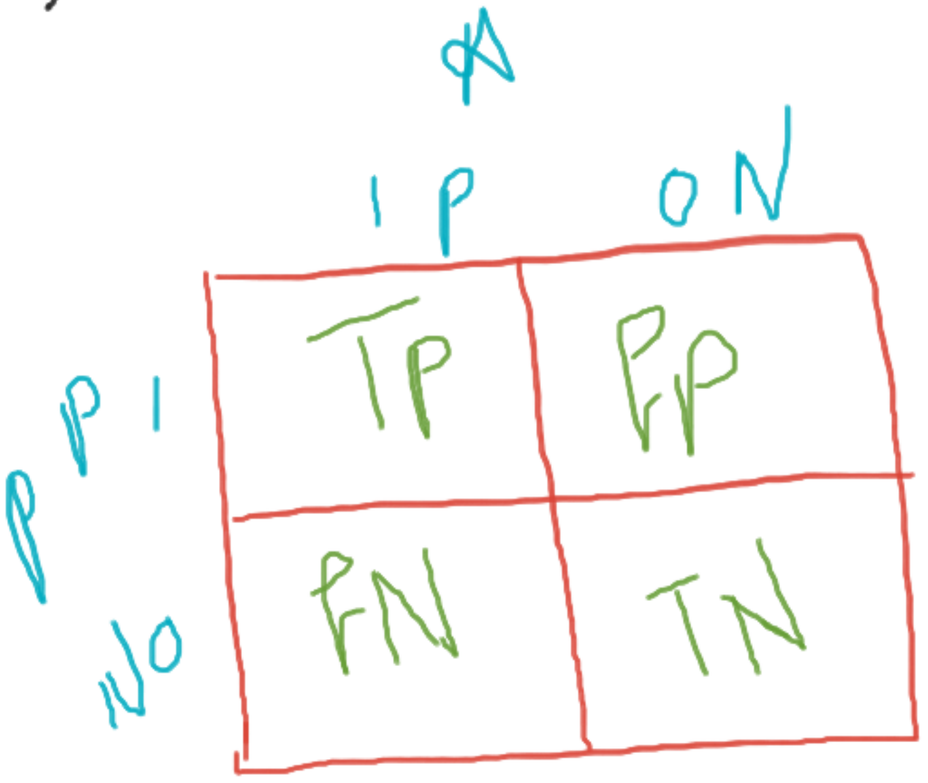
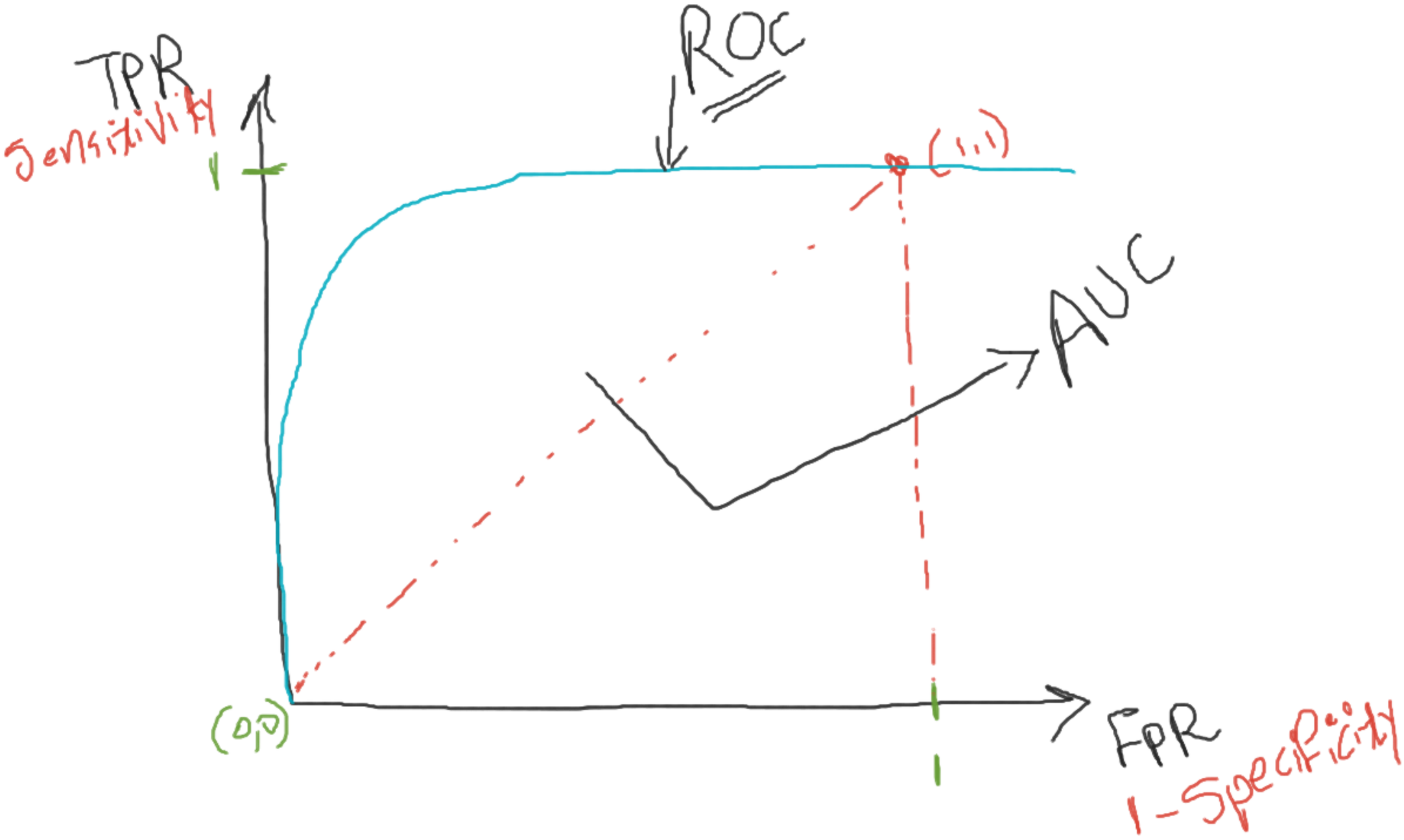
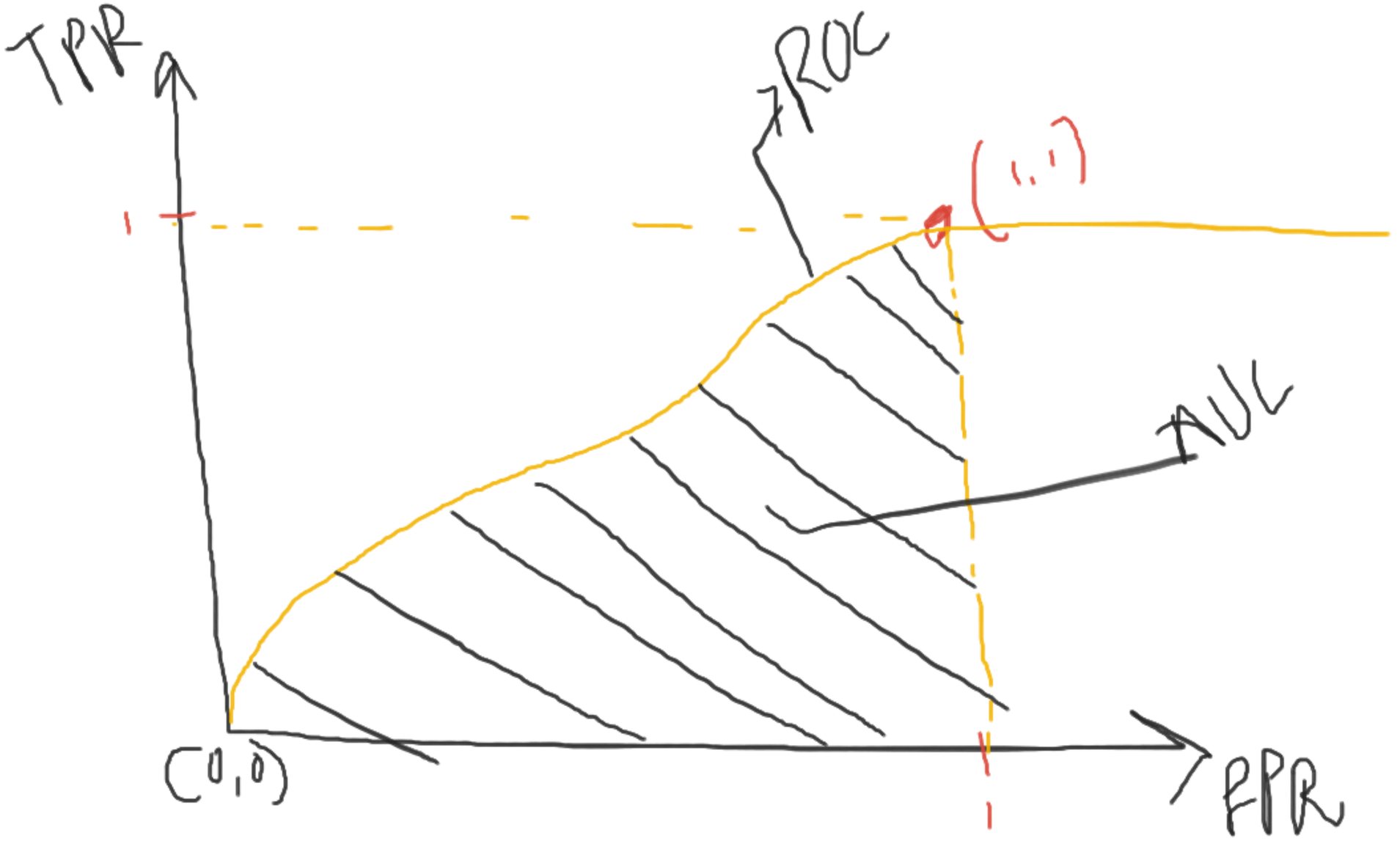
ROC (Receiver Operating Curve)

AUC (Area under the curve)

$$Acc = \frac{TP + TN}{TP + TN + FN + FP}$$




TPR
Sensitivity
1
ROC
(1,1)
AUC
(0,0)
FPR
1-Specificity


TPR
ROC
(1,1)
AUC
(0,0)
FPR

Y_a	Y_p	$Y_{(0)}$	$Y_{(0.2)}$	$Y_{(0.4)}$	$Y_{(0.6)}$	$Y_{(0.8)}$	$Y_{(1.0)}$
1	0.8	1	1	1	1	1	1
1	0.7	1	1	1	1	1	0
0	0.3	1	1	0	0	0	0
0	0.6	1	1	1	1	0	0
1	0.4	1	1	1	0	0	0
0	0.1	1	0	0	0	0	0

ROC & AUC :- TPR & FPR

$$TPR = \frac{TP}{TP+FN} \qquad FPR = \frac{FP}{FP+TN}$$

Threshold = 0.2

$$TPR = \frac{TP}{TP+FN} = \frac{3}{3+0} = 1$$

$$FPR = \frac{FP}{FP+TN} = \frac{2}{2+1} = \frac{2}{3} = 0.66$$

Threshold = 0.5

$$TPR = \frac{TP}{TP+FN} = \frac{2}{2+1} = \frac{2}{3} = 0.66$$

$$FPR = \frac{FP}{FP+TN} = \frac{1}{1+2} = \frac{1}{3} = 0.33$$

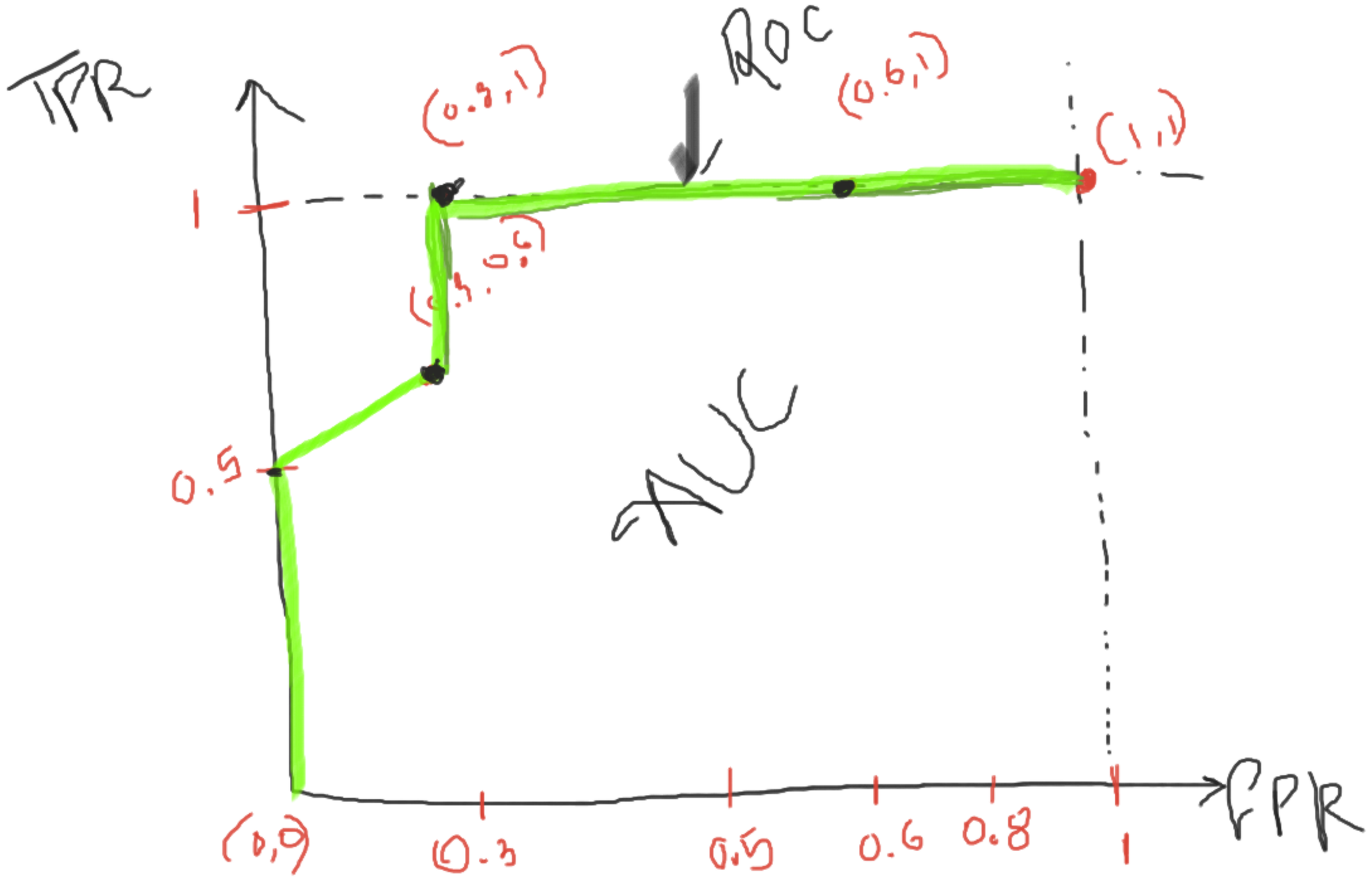
Thresh = 0.4

$$TPR = \frac{3}{3+0} = 1$$

$$FPR = \frac{1}{1+2} = \frac{1}{3} = 0.33$$

Class 0 $\Rightarrow$ < 0.5

class 1 $\Rightarrow$ $>= 0.5$


TPR
ROC
(0.3,1)
(0.6,1)
(1,1)
1
(0.3,0.6)
0.5
AUC
(0,0)
0.3
0.5
0.6
0.8
1
FPR