ROC & AUC curve

ROC - AUC curve
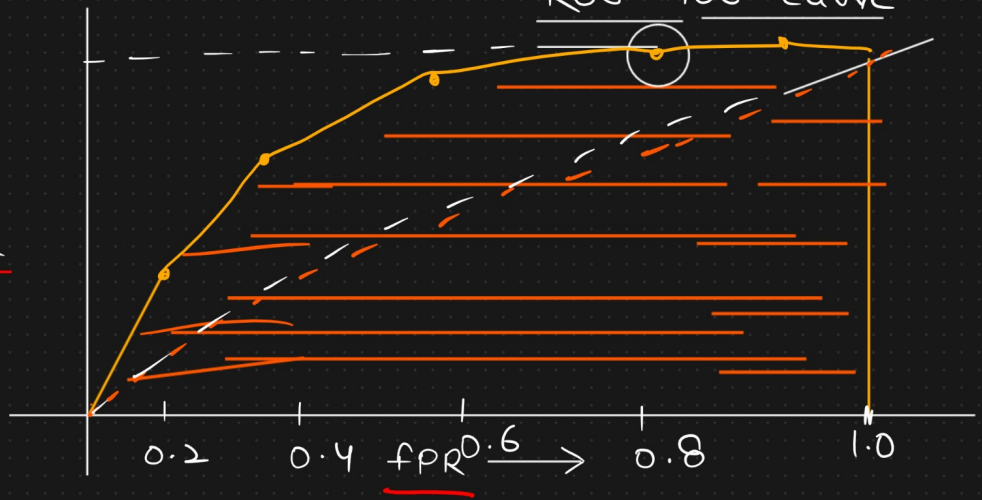
Diabetes
Prediction

Healthcare
↳ TPR
↳ Recall

TPR

0.2   0.4 fPR 0.6 →   0.8   1.0

Actual

Predicted		0	1
	0	TN	fN
	1	fP	TP

$$TPR \ (Recall) = \frac{TP}{TP+FN}$$

$$fPR = \frac{fP}{fP+TN}$$

Threshold $(0, 0.2, 0.4, 0.6, 0.8, 1.0)$

y	$\hat{y}$ Probability	$\hat{y}(0)$	$\hat{y}(0.2)$	$\hat{y}(0.4)$
1	0.72	1	1	1
0	0.49	1	1	1
0	0.52	1	1	
1	0.12	1	0	0
0	0.94	1	1	1
1	0.24	1	1	0
1	0.15	1	0	0

$\hat{y}$

> threshold ———— 1

≤ threshold ———— 0

$$\hat{y}_{(0.2)} \begin{cases} TPR = \dfrac{2}{2+2} = \dfrac{2}{4} = \frac{1}{2} = 0.5 \\ \\ fPR = \dfrac{3}{3+0} = 1 \end{cases}$$

$$\hat{y}_{(0.4)} \begin{cases} TPR \\ fPR \end{cases} \qquad \hat{y}_{(0.6)} \begin{cases} TPR \\ fPR \end{cases}$$

$$\hat{y}_{(0.8)} \begin{cases} TPR \\ fPR \end{cases}$$

$$\hat{y}_{(1.0)} \begin{cases} TPR \\ fPR \end{cases}$$