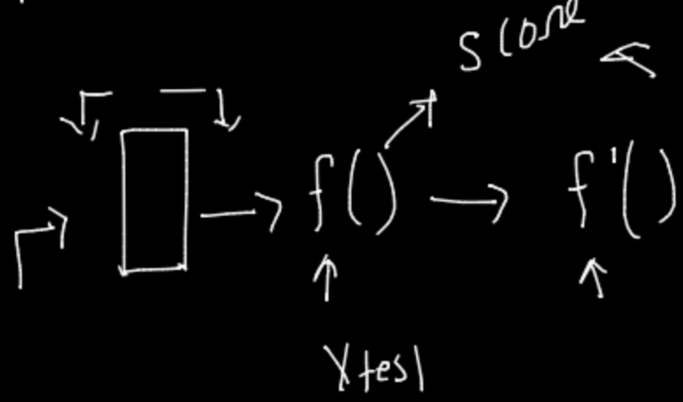
ROC and AUC

↑

Receiver operating characteristics

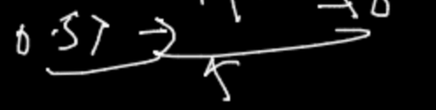
Area under curve

Binary classification



(X, Y)

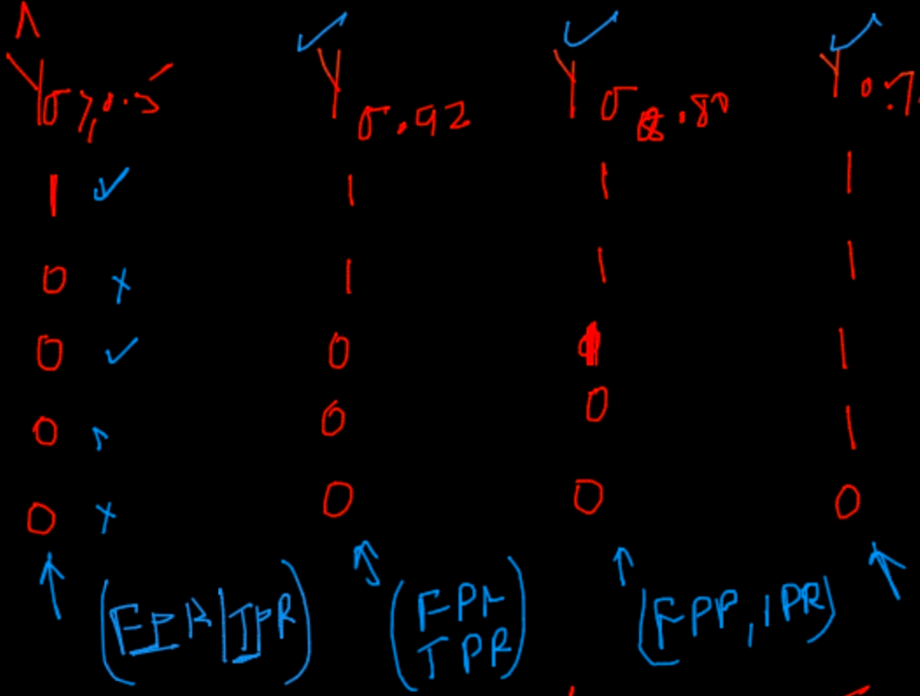
↳ ∈ [0, 1]



0.75 → 75% → 1

eg: Step 1 → compute prob-score and sort it in decreasing order

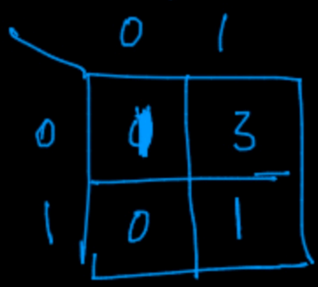
	X	Y	Ŷ
X1		1	0.95
X2		1	0.92
X3		0	0.80
X4		1	0.76
X5		1	0.71



Steps: Take threshold say σ = 0.95 if σ ≥ 0.95 → 1 else → 0

FPR = FP / N → '0'

TPR = P / 4 → 0.22



N = 1 (1), P = 4

FPR → 1 (5)

TPR

(0, 0.22)
FPR
TPR
plot
TN
TP
AUG
∫f(x)dx
suggestion
AUC
TPR
FPR
Random model
50%
AUC → 50%

2 / 5

f1-6, Pre, Recall, CM, ROC & AOL*

↑ n-class

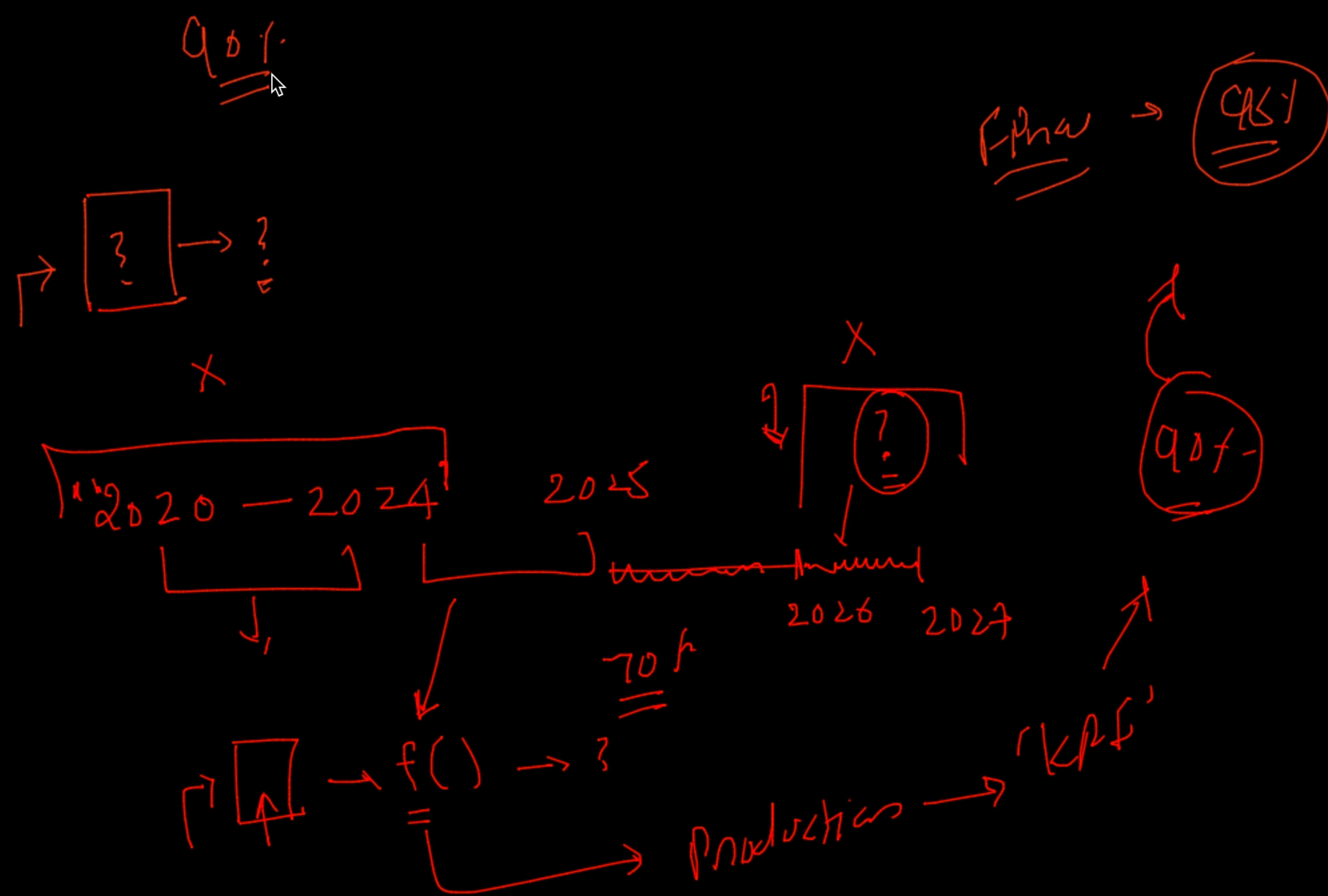
↑ Binary class

(X, Y)

↳ [0, 1, 2 3 - n]

All ↓, ↓, ↓, ↓

KPI ↓


90%
2020 — 2024
2025
2026
2027
70%
f( )
Production
'KPI'
95%

log-loss → Binary Classification 0.57 → (1)

use prob-score

medical domain

	X	Y		$\hat{Y}$ (prob-score)	loss-1
✓	X1	1	1	0.9 →	$-\log(0.9) * 1 \to 0.0457$
✓	X2	1	1	0.6 →	$-\log(0.6) * 1 \to 0.22$ ← No1
✓	X3	0	0	0.1 →	$-\log(0.9) * 1 \to 0.045$ (less)
✓	X4	0	0	0.4	$-\log(0.6) \to 0.22$ ↑

'less'

1 (class)

$$\text{log loss} = -\frac{1}{n}\sum_{i=1}^{n} \log(p_i) * y_i + (1-y_i) * \log(1-p_i)$$

$(1-1)$

0

< 0.54

Acc [0 - 1]

error ↑ loss

→ f()

(0 - 1)

$(Y - \hat{Y})$ ↑

'Random model' → log-loss - '0.54'

↓ log ↑ ↑