AGENDA – DAY 4 – 23-NOV-2025 (SUN)

- <mark>REACP – DAY 3 + DOUBT CLEARING – MAX 10 MINUTES</mark>

- DAY 4
  - Supervised Learning – Regression (Contd…)
    - Model Optimisation
    - Sklearn Pipeline
  - Hands-On Demo

  - Supervised Classification
    - Logistic Regression
    - Naive Bayes' Classifier
    - KNN
    - Decision Tree
- Q & A
- SUMMARY, HEADS-UP FOR DAY 5 & CLOSURE

**REACP – DAY 3 + DOUBT CLEARING – MAX 10 MINUTES**

- LASSO
- RIDGE

$$SSE_{RIDGE} = \sum_{1} (Y - \hat{Y})^2 + \lambda \sum_{1} \beta^2 \longrightarrow L_2$$

$$SSE_{LASSO} = \sum_{1} (Y - \hat{Y})^2 + \lambda \sum_{1} |\beta| \longrightarrow L_1$$

$$0.01$$
$$0.01 \times 0.01$$

$\downarrow$ EN
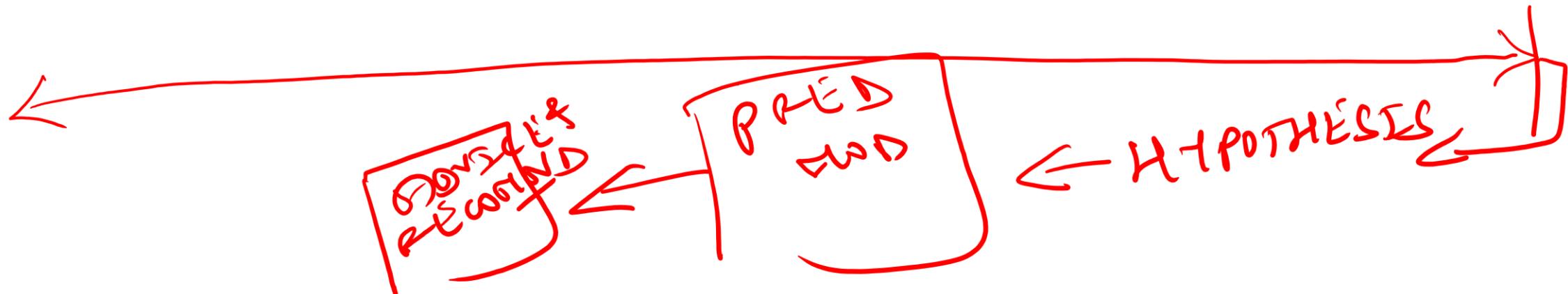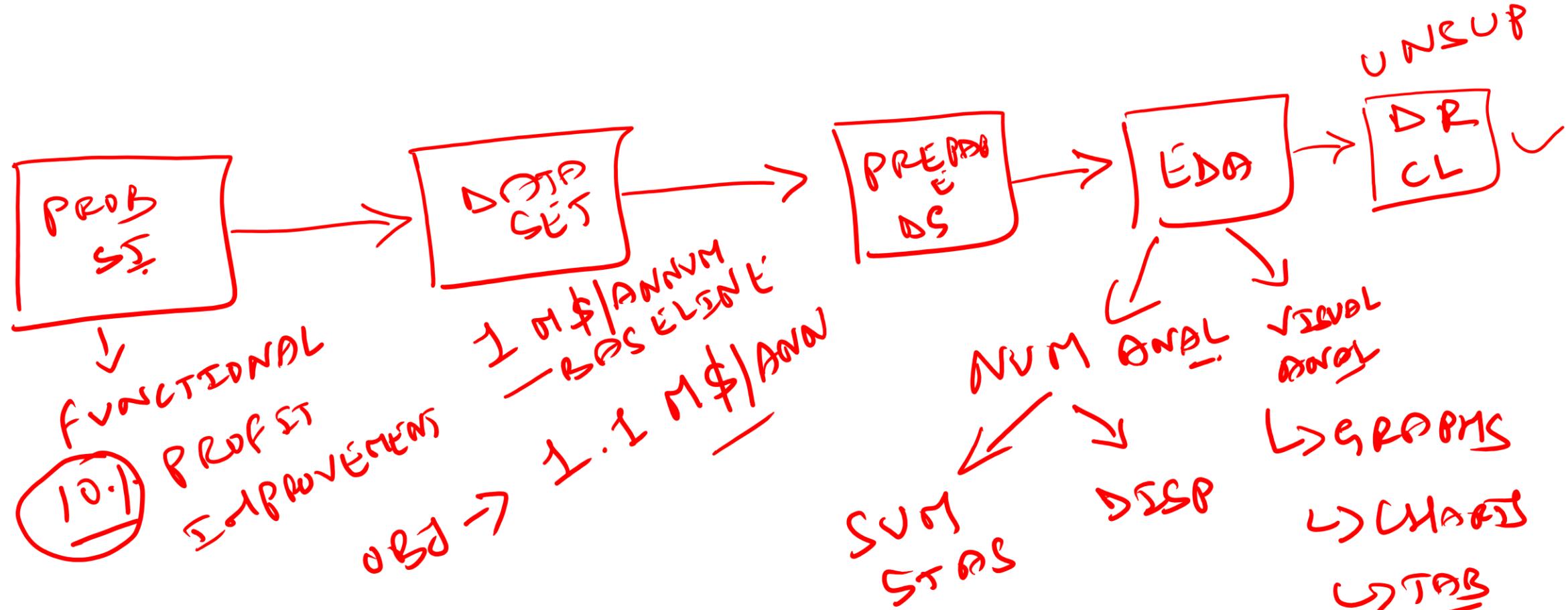
$\lambda, \ '\alpha' \longrightarrow$ MIXING PARAMETER

$\alpha = 0 \longrightarrow$ RIDGE

$\alpha = 1 \longrightarrow$ LASSO

PROB ST. → DATA SET → PREP & DS → EDA → DR CL (UNSUP)

PROB ST. → FUNCTIONAL
10.1 PROFIT IMPROVEMENT

DATA SET → 1 M$/ANNUM BASELINE
OBJ → 1.1 M$/ANN

EDA → NUM ONAL / VISUAL ANAL
NUM ONAL → SUM STAS / DISP
VISUAL ANAL → GRAPHS / CHARTS / TAB

CONSIDER RECOM'ND ← PRED MOD ← HYPOTHESIS

A & B → 2 EVENTS

COND PROB:

→ $P(A|B) = \dfrac{P(A \cap B)}{P(B)}$ ✓ — ①

$P(A \cap B) = P(A) \cdot P(B|A)$

→

$P(B|A) = \dfrac{P(A \cap B)}{P(A)}$ ✓ — ②

∴ $P(A \cap B)$
$= P(B \cap A)$

$$P(B) \cdot P(A|B) = P(A \cap B) \longrightarrow \boxed{3}$$

$$P(A) \cdot P(B|A) = P(A \cap B) \longrightarrow \boxed{4}$$

$$P(RT|RY)$$

$$\uparrow$$

$$\begin{bmatrix} P(Y=1| x_1, x_2, \ldots, x_n) \\[2em] P(Y=0| x_1, x_2, \ldots, x_n) \end{bmatrix}$$

$1 \Rightarrow$ DEF
SUCCESS ✓

$0 \rightarrow$ FAILURE

ODDS & PROBABILITIES:

$$\text{ODDS RATIO} = \frac{P}{1-P} = \frac{P(S)}{P(F)}$$
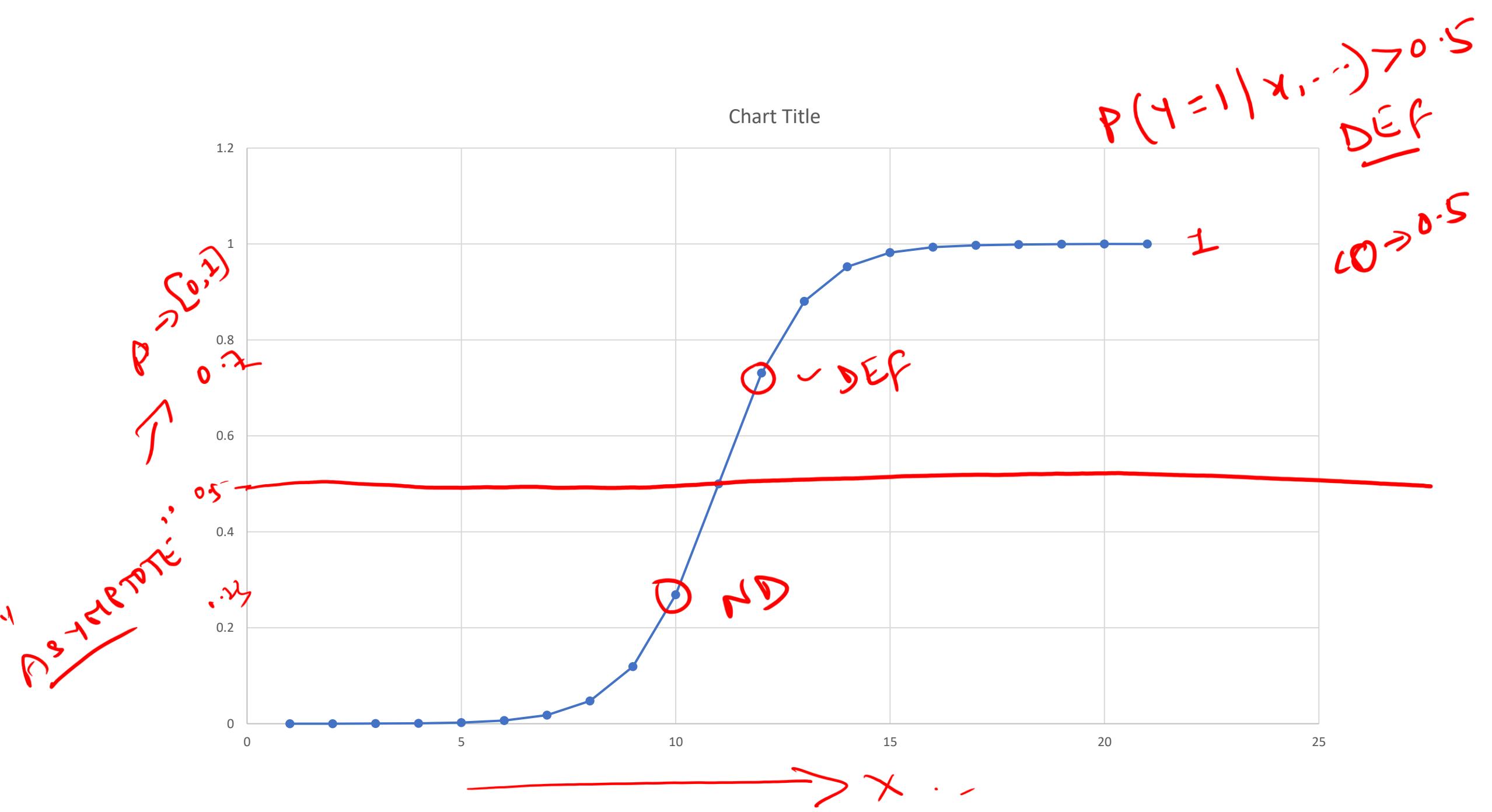
$$\ln\left(\frac{P}{1-P}\right) = \beta x \qquad \longrightarrow \qquad \beta x = \beta_0 + \beta_1 x_1 + \cdots \beta_k x_k$$

$$\frac{P}{1-P} = e^{\beta x}$$

$$P = e^{\beta x}(1-P)$$

$$P = e^{\beta x} + P \cdot e^{\beta x}$$
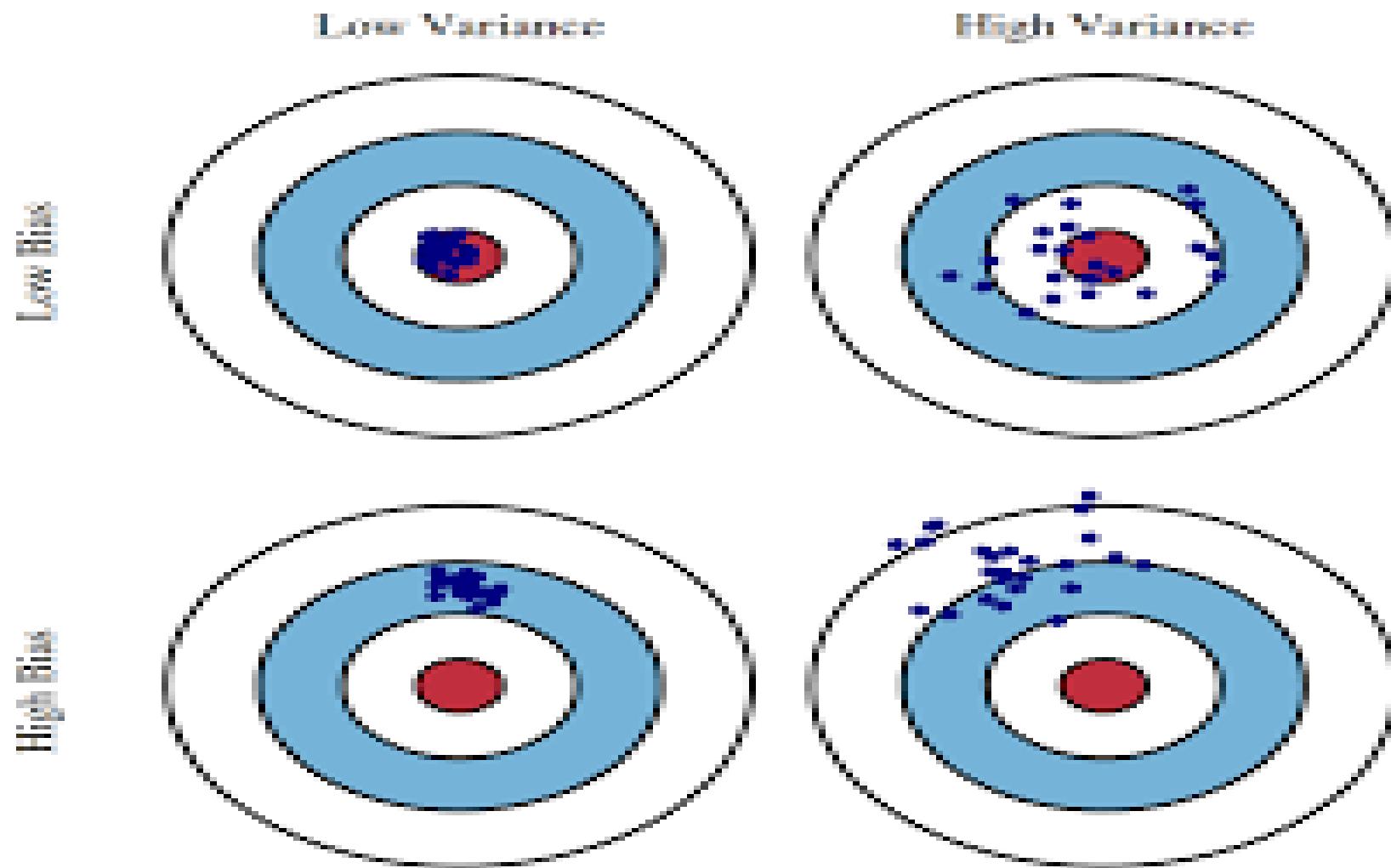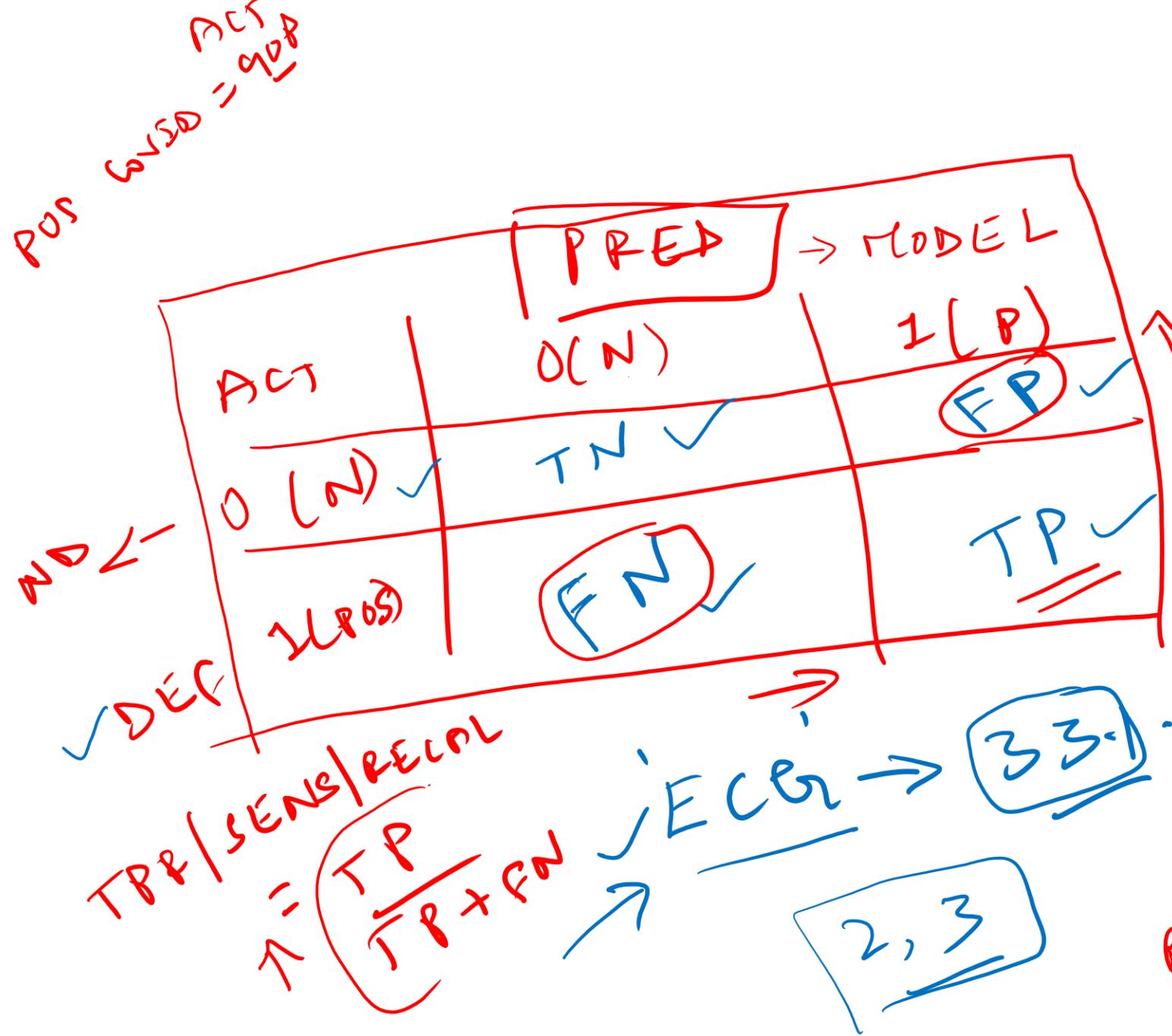
$$P + P e^{\beta x} = e^{\beta x}$$

$$P(1 + e^{\beta x}) = e^{\beta x}$$

$$P = \frac{e^{\beta x}}{1 + e^{\beta x}}$$

Chart Title

$P(Y=1 \mid x, \cdots) > 0.5$

DEF

$<0 \Rightarrow 0.5$

1

~ DEF

ND

$P \rightarrow [0,1]$

0.7

ASYMPTOTE: 0.5

$\cdot z$

$\rightarrow x \cdots$

$$\text{ODDS} = \boxed{2} \checkmark \checkmark$$

$$P(D \mid \text{MEMI})$$

EMI → INDICTOR π

$\overline{\text{INDIA}}$ VS POK

ACT CONSD = POS

POS CONSD = POS

→ MODEL

PRED

ACT	0 (N)	1 (P)
0 (N)	TN ✓	FP ✓
1 (POS)	FN ✓	TP ✓

ND ←
DEF 1(POS)

0 → ND
1 → DEF

100 − LB
97 → ND
3 → DEF

PRED 100
97 % ✓

TPR / SENS / RECL

$$\uparrow = \frac{TP}{TP + FN} \quad \checkmark ECG \rightarrow \boxed{33.}$$

$\boxed{2, 3}$
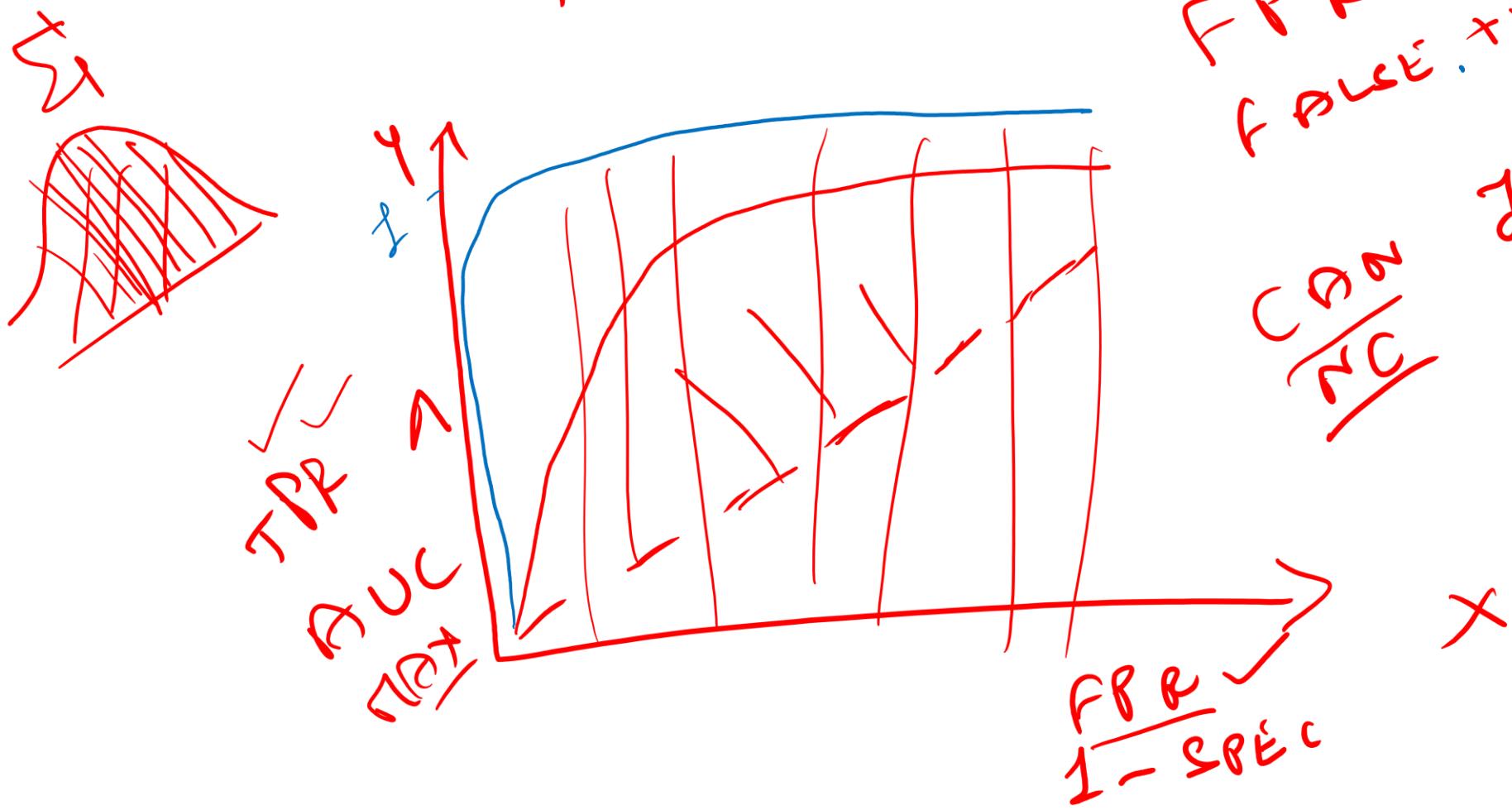
$$PREC = \frac{TP}{TP + FP} \rightarrow \boxed{3} \% \quad X$$

$$FBR = \frac{FP}{FP + TN} = 1 - SPECIFICITY.$$

FPR
FALSE +VE RATE

$J = TPR - \frac{FPR}{\downarrow}$

1-SPEC

$\frac{CON}{NC}$

$FPR = \frac{FP}{(TP+FN)}$

Σ

Y
1

TPR ↑
AUC
max

FPR
1-SPEC

X