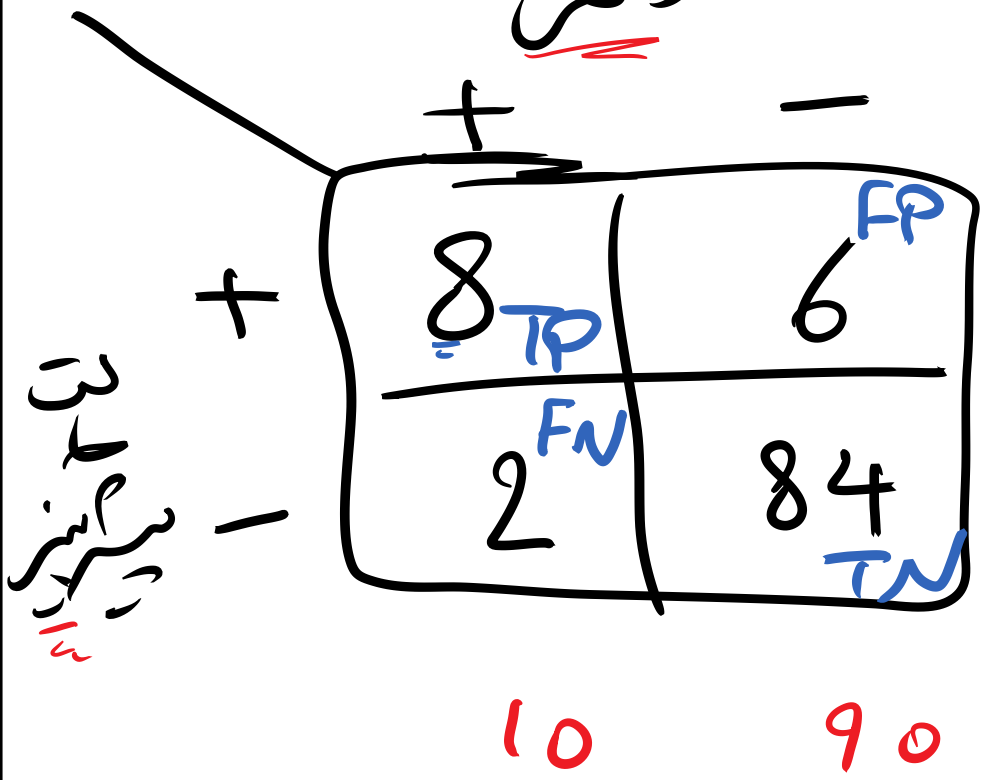
Confusion Matrix



$$Acc = \frac{TP+TN}{N}$$

دقت 92٪ خطا 8٪

$$Precision = \frac{TP}{TP+FP} = \frac{8}{14}$$

$$Sensitivity, Recall = \frac{TP}{TP+FN} = \frac{8}{10}$$

$$F\text{-score} = 2\frac{Precision \times Recall}{Precision + Recall}$$

Test

4 classes

	1	2	3	4
1	50	1	0	1
2	2	48	6	0
3	0	9	51	0
4	2	1	0	55

Precision

Recall

$$ACC = \frac{50+48+51+55}{n}$$

$$Precision_1 = \frac{50}{50+1+0+1} = \frac{50}{52}$$

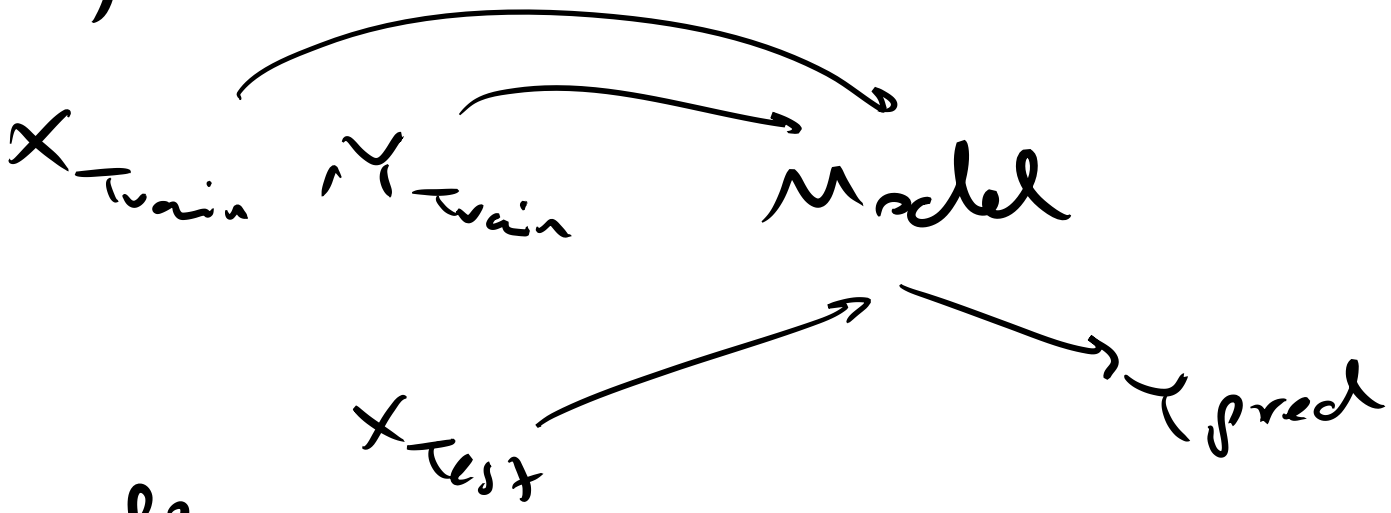
$$Precision_3 = \frac{51}{51+9} = \frac{51}{60}$$

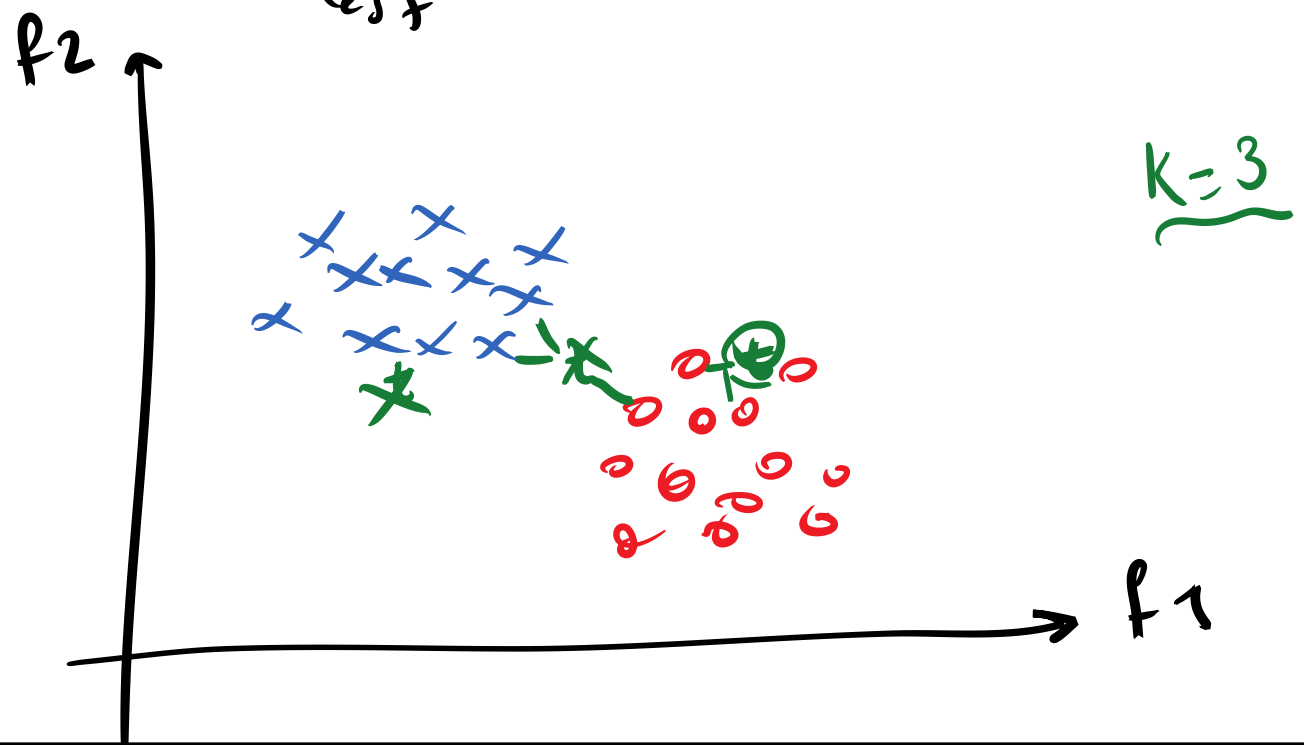
$$Recall_2 = \frac{48}{1+48+9+1} = \frac{48}{59}$$

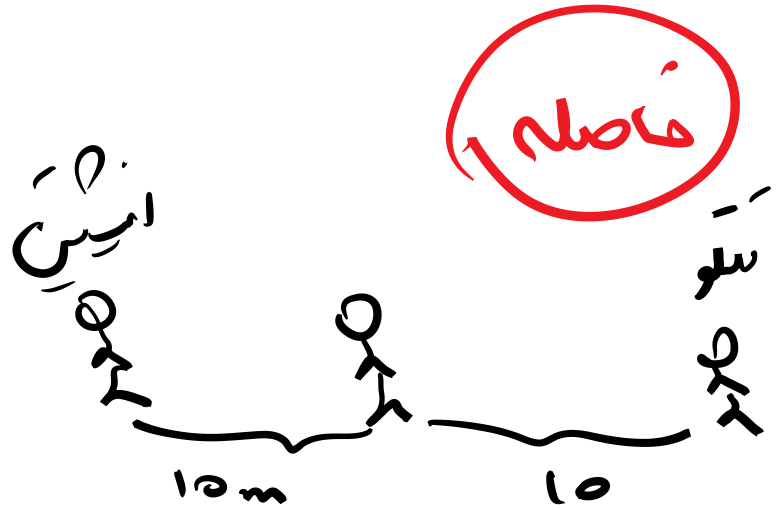
$$Recall_4 = \frac{55}{56}$$

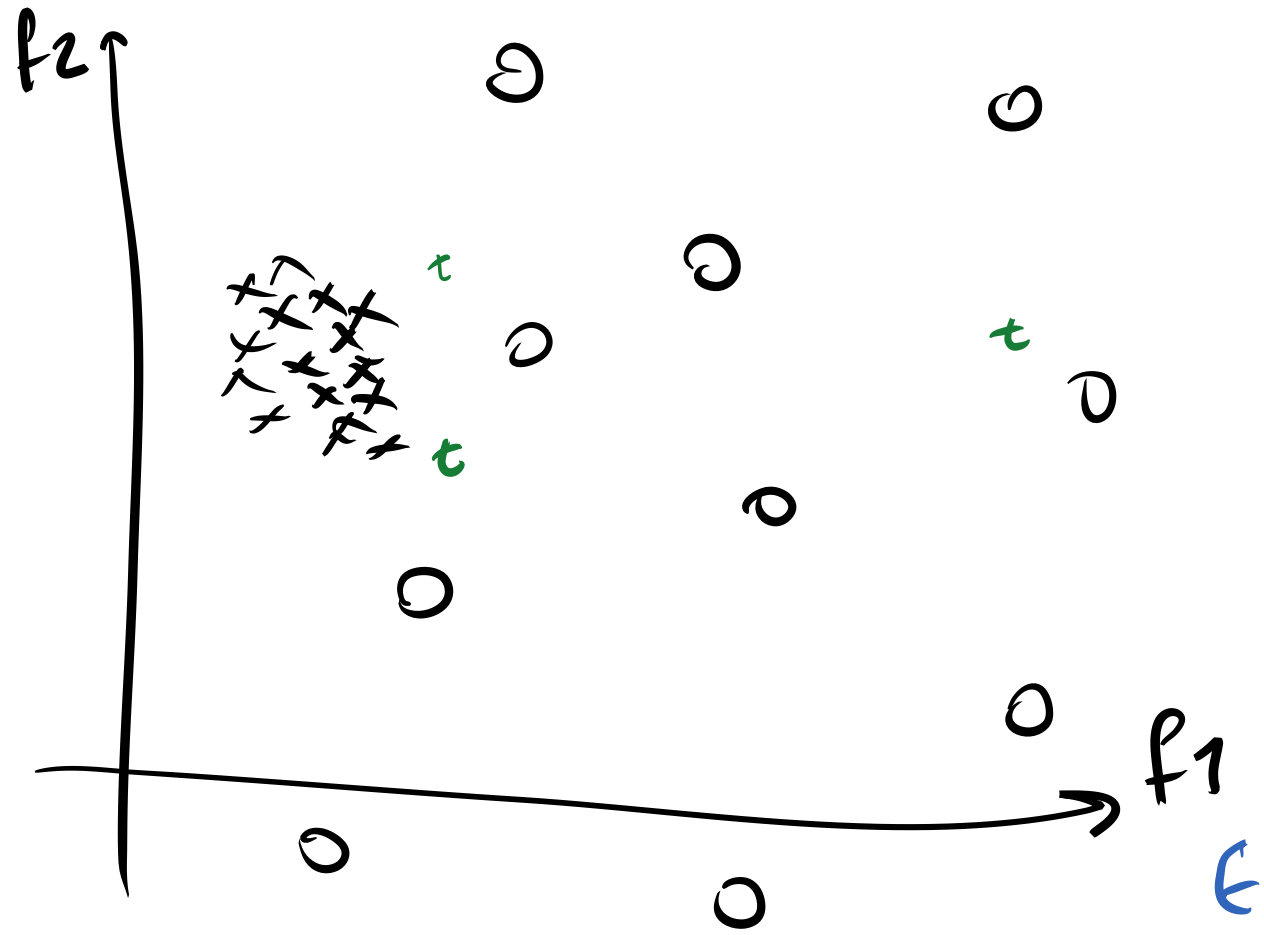
fscore

7) KNN









f1 f2 f1 f2

امثلة (2, 5) (3, 8)

$$\sqrt{(2-3)^2+(5-8)^2}$$

2x1

P_1 P_2

fx1 fx1

$$\sqrt{(P_1-P_2)^T(P_1-P_2)}$$

Euclidian Distance

1x1 fx1

$$Mahalanobis\_Distance_{(P_1,P_2)} = \sqrt{(P_1 - P_2)^T \Sigma^{-1} (P_1 - P_2)}$$

$(P_1 - P_2)$: $1 \times f$ — Σ^{-1}: $f \times f$ — $(P_1 - P_2)$: $f \times 1$

ماتریس کوواریانس Σ

$$\Sigma = \begin{bmatrix} Var(x_1) & Cov_{1,2} & Cov_{1,3} \\ Cov_{2,1} & Var(x_2) & Cov_{2,3} \\ Cov_{3,1} & Cov_{3,2} & Var(x_3) \end{bmatrix}_{3 \times 3}$$

$$Cov(x,y) = \frac{1}{n} \sum (x_i - \mu_x)(y_i - \mu_y)$$

$$\sigma^2 = Var(x) = \frac{1}{n} \sum (x_i - \mu)^2$$

$N(\mu, \sigma)$ $N(\mu, \Sigma)$