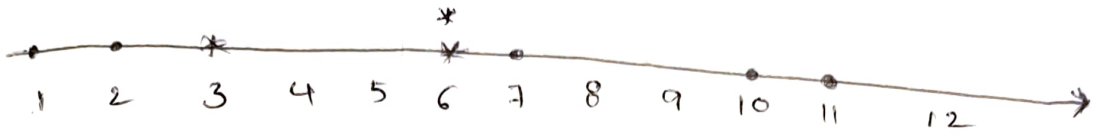
Question 10 :-



Splitting the data set into 2 equal halfs

One is training data set

Other is testing data set

Training data :- [1, 2, 3, 6]

Training Labels :- [dot, dot, cross, cross]

Testing data :- [6, 7, 10, 11]

Testing Labels :- [cross, dot, dot, dot]

Predicted (x x x x)

1 → dot

dot(•)

(2,3,6) = ~~cross~~

2 → dot

(1,3,6) = dot(•)

3 → cross

(1,2,6) = cross(x)

6 → cross

(1, 2, 3) = cross(x)

1, 2, 3, 6 → cross(x)

Since k=3 In KNN we need to consider three Nearest points to determine the Output.

Training data : [1, 2, 3, 6], basing on this

For 6 the Nearest 3 neighbours are ~~(7,3,6)~~ (6, 3, 2) :

[cross, cross, ~~dot~~ cross)

For 7 the Nearest 3 neighbours are (x)

Since the model has all x (cross). it predicts all as cross

like that

10 will be predicted as cross (x)

11 will be predicted as cross (x)

Confusion matrix :-

(6, 7, 10, 11)

Act : (+, -, -, -)

pred : (+, +, +, +)

	Total	Predicted condition. Positive •	Negative x
Actual condition	positive (3) •	TP 0	FN 3
	class(x) Negative (1)	FP 0	TN 1

$P = TP + FN = 0 + 3 = 3$

$N = FP + TN = 0 + 1 = 1$

Accuracy :-

$$ACC = \frac{TP + TN}{P + N} = \frac{0 + 1}{3 + 1} \Rightarrow 1/4$$

$\Rightarrow 25\%$

Sensitivity :-

(or)

True positive rate (TPR) :-

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

$\Rightarrow 0\%$

Specificity :-

(or)

True Negative rate (TNR) :-

$$TNR = \frac{TN}{N} = \frac{TN}{TN + FP} = \frac{1}{1 + 0} = 1$$

$\Rightarrow 100\%$