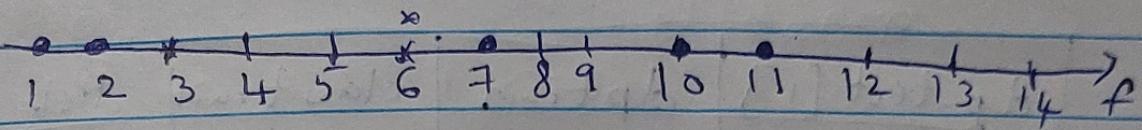


ES 5710 - Assignment 1 (22002)

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Q.No 10 :-



Assume class A = [1, 2, 7, 10, 11]

class B = [3, 6, 8]

splitting data points to Equal sets

$$dp_train = [1, 2, 3, 6]$$

$$class_train = [A, A, B, B]$$

$$dp_test = [6, 7, 10, 11]$$

Data points	class
1	A
2	A
3	B
6	B
7	A
10	A
11	A

$$class_test = [B, A, A, A]$$

RNN where $k=3$ $Euc. Dist = \sqrt{(x-x_j)^2}$

as there is only 1 feature

$$dp_test[0] = 6 \Rightarrow d-test[0] \left| \begin{array}{l} dp_train \\ dist \\ class_train \end{array} \right.$$

$$\text{eg } \sqrt{(6-1)^2}$$

$$\Rightarrow \sqrt{25} = 5$$

6	1	5	A
6	2	4	(A) $\rightarrow k=3$
6	3	3	(B) $\rightarrow k=2$
6	0	0	(B) $\rightarrow k=1$

Majority $\Rightarrow B$ * Prediction = B

dp-test [1] = 7

dp-test [1]	dp-train	class-train	dist	Majority = B *pred = B
7	1	A	6	
7	2	A	5 = 7 k = 3	
7	3	B	4 \Rightarrow k = 2	
7	6	B	1 = 7 k = 1	

dp-test [2] = 10

dp-test [2]	dp-train	class-train	dist	Majority = B *pred = B
10	1	A	9	
10	2	(A)	8 \Rightarrow k = 3	*pred = B
10	3	(B)	7 \Rightarrow k = 2	
10	6	(B)	4 \Rightarrow k = 1	

dp-test [3] = 11

dp-test [3]	dp-train	class-train	dist	Majority = B *pred = B
11	1	A	10 =	
11	2	(A)	9 \Rightarrow k = 3	*pred = B
11	3	(B)	8 \Rightarrow k = 2	
11	6	(B)	5 \Rightarrow k = 1	

$$dp_test = [6, 7, 10, 11]$$

$$class_test = [B, A, A, A] \Rightarrow \text{Actual classification}$$

$$pred_test = [B, B, B, B] \Rightarrow \text{predicted output}$$

Part 2

We should Assume A = Positive

B = Negative

confusion Matrix

		Actual	
		positive	Negative
Pred	P	TP	FP
	N	FN	TN

In this case =)

	P	N	
P	0	3	\Rightarrow Confusion Matrix
N	0	1	

$$\text{Now, Accuracy} = \frac{TN + TP}{TN + TP + FN + FP} = \frac{1 + 3}{1 + 3 + 0 + 0} = \frac{4}{4} = 0.25$$

$$\boxed{\text{Accuracy} = 25\%}$$

$$\text{Sensitivity} = \frac{\text{TP}}{\text{TP} + \text{FN}} = \frac{0}{0} \Rightarrow \text{Worst case Sensitivity is represented by 0}$$

$$\boxed{\text{Sensitivity} = 0\%}$$

$$\text{Specificity} = \frac{\text{TN}}{\text{TN} + \text{FP}} = \frac{1}{4} = 0.25$$

$$\boxed{\text{Specificity} = 25\%}$$