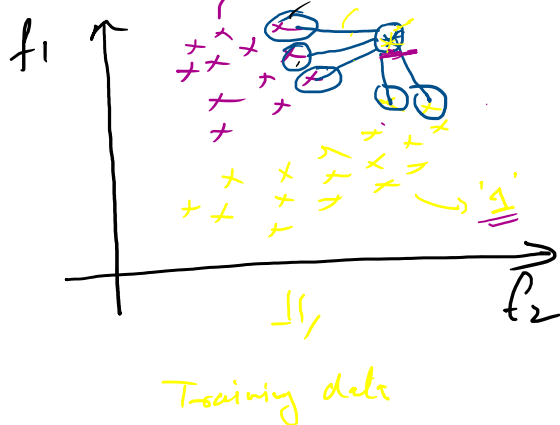


K nearest Neighbours (KNN)

- ① Classification
- ② Regression

① Classification:



$K=5$

$\left\{ \begin{array}{l} 0's \rightarrow 3 \\ 1's \rightarrow 2 \end{array} \right\}$

{ Binary category }

f_1	f_2	y	\hat{y}
-	-	0	1
		1	<u>1</u>
		1	<u>0</u>
		0	<u>0</u>
		1	1

- ① we have to initiate the K value, $K > 0$
 $K = 1, 2, 3, \dots$

$K=5$

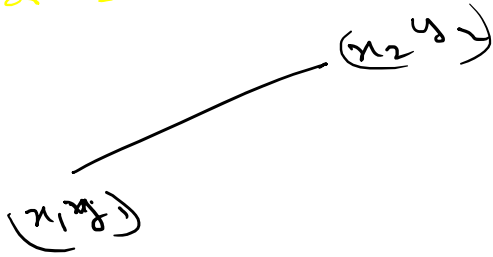
- ② Find the K nearest neighbours from the test data
- ③ from those $K=5$ how many neighbours belongs to 0 category & 1 category

Distance Metrics

- (1) Euclidean Distance
- (2) Manhattan Distance

① Euclidean Distance

For 2D

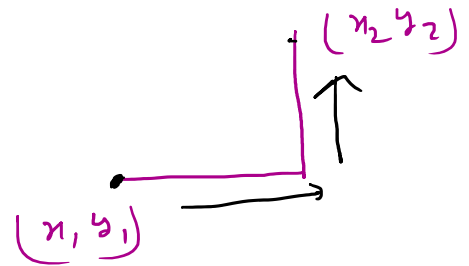
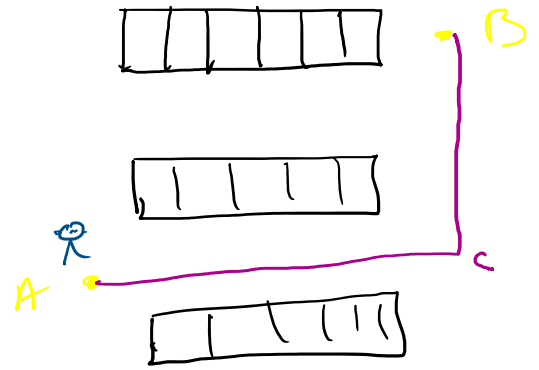


$$D = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

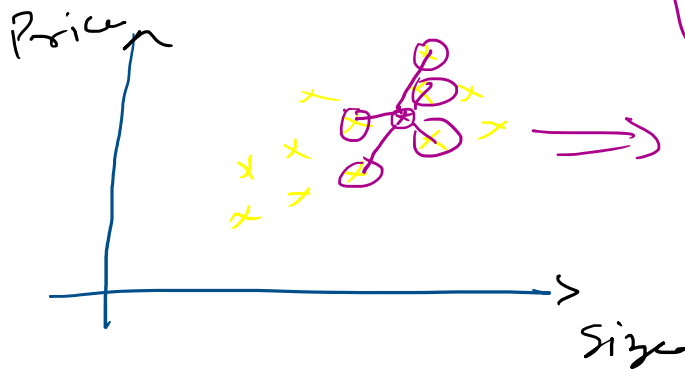
For 3D

$$D = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2}$$

② Manhattan Distance



② Regression



regression parameter tuning
 $K=5$

o/p Avg or median