**K-distance:**

k-distance(xi) is the distance to the kth  Neighbor of xi from xi.

Nk=5(xi) = Neighborhood of xi = Set of all the k or 5 nearest neighbors.

Therefore for below example Nk=5(xi) = { x1, x2, x3, x4, x5 }.

Note: all are present on the basis of smallest distance or nearest to xi.

Therefore what is N(xi) for k=3. Pick 3 nearest neighbors of xi and include them in set, therefore:

Nk=3(xi) = { x1, x2, x3 }.

Note: What If all points lie on the circumference of the circle, then they have equal distance from xi, so how to classify as x1, x2mm.

We can choose any one of the all points. since all points are at equal distance

