

Minimum Distance Algorithm

Example.

$$\begin{aligned} X1 &= (0 \ 0) \\ X2 &= (3 \ 8) \\ X3 &= (2 \ 2) \\ X4 &= (1 \ 1) \\ X5 &= (5 \ 3) \\ X6 &= (4 \ 8) \\ X7 &= (6 \ 3) \\ X8 &= (5 \ 4) \\ X9 &= (6 \ 4) \\ X10 &= (7 \ 5) \end{aligned}$$

SoL.

$$1) \ X1=Z1=(0 \ 0) \quad T=5$$

$$d_{21} = \sqrt{(3-0)^2 + (8-0)^2} = 8.5$$

$$\therefore d_{21} > T \quad \therefore X2 = Z2$$

$$2) \ z1=(0 \ 0) \quad z2=(3 \ 8) \quad T=5$$

$$d_{31} = \sqrt{(2-0)^2 + (2-0)^2} = 2.8$$

$$d_{32} = \sqrt{(2-3)^2 + (2-8)^2} = 6.1$$

$$\therefore d_{31} < 5 \quad \therefore X3 \in Z1$$

$$3) \ z1=(0 \ 0) \quad z2=(3 \ 8) \quad T=5$$

$$d_{41} = \sqrt{(1-0)^2 + (1-0)^2} = 1.4$$

$$d_{42} = \sqrt{(1-3)^2 + (1-8)^2} = 7.3$$

$$\therefore d_{41} < 5 \quad \therefore X4 \in Z1$$

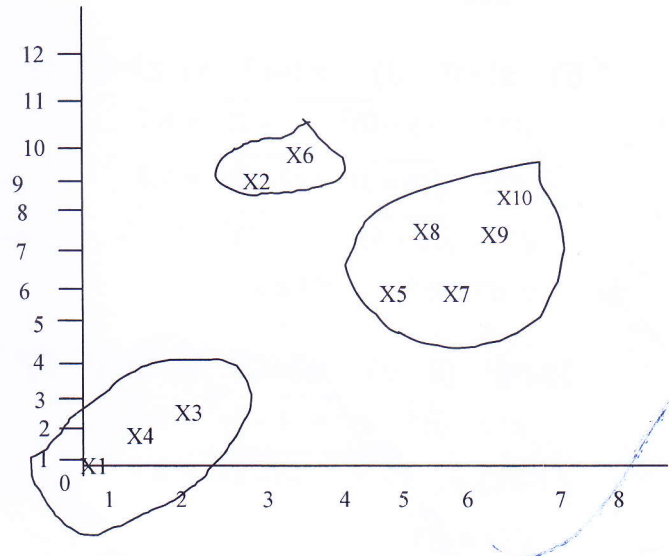
$$4) \ z1=(0 \ 0) \quad z2=(3 \ 8) \quad T=5$$

$$d_{51} = \sqrt{(5-0)^2 + (3-0)^2} = 5.8$$

$$d_{52} = \sqrt{(5-3)^2 + (3-8)^2} = 5.4$$

$$\therefore d_{51} \ \& \ d_{52} > 5 \quad \therefore X5 = Z3$$

$$5) \ z1=(0 \ 0) \quad z2=(3 \ 8) \quad z3=(5 \ 3) \quad T=5$$



$$d61 = \sqrt{(4-0)^2 + (8-0)^2} = 8.9$$

$$d62 = \sqrt{(4-3)^2 + (8-8)^2} = 1$$

$$d63 = \sqrt{(4-5)^2 + (8-3)^2} = 5.1$$

$$\therefore d62 < 5 \quad \therefore X6 \in Z2$$

$$6) \quad z1=(0 \ 0) \quad z2=(3 \ 8) \quad z3=(5 \ 3) \quad T=5$$

$$d71 = \sqrt{(6-0)^2 + (3-0)^2} = 6.7$$

$$d72 = \sqrt{(6-3)^2 + (3-8)^2} = 5.8$$

$$d73 = \sqrt{(6-5)^2 + (3-3)^2} = 1$$

$$\therefore d73 < 5 \quad \therefore X7 \in Z3$$

$$7) \quad z1=(0 \ 0) \quad z2=(3 \ 8) \quad z3=(5 \ 3) \quad T=5$$

$$d81 = \sqrt{(5-0)^2 + (4-0)^2} = 6.4$$

$$d82 = \sqrt{(5-3)^2 + (4-8)^2} = 4.5$$

$$d83 = \sqrt{(5-5)^2 + (4-3)^2} = 1$$

$$\therefore d83 < 5 \quad \therefore X8 \in Z3$$

$$8) \quad z1=(0 \ 0) \quad z2=(3 \ 8) \quad z3=(5 \ 3) \quad T=5$$

$$d91 = \sqrt{(6-0)^2 + (4-0)^2} = 7.2$$

$$d92 = \sqrt{(6-3)^2 + (4-8)^2} = 5$$

$$d93 = \sqrt{(6-5)^2 + (4-3)^2} = 1.4$$

$$\therefore d93 < 5 \quad \therefore X9 \in Z3$$

$$9) \quad z1=(0 \ 0) \quad z2=(3 \ 8) \quad z3=(5 \ 3) \quad T=5$$

$$d101 = \sqrt{(7-0)^2 + (5-0)^2} = 8.6$$

$$d102 = \sqrt{(7-3)^2 + (5-8)^2} = 5$$

$$d103 = \sqrt{(7-5)^2 + (5-3)^2} = 2.8$$

$$\therefore d103 < 5 \quad \therefore X10 \in Z3$$

$$\text{set1} = \{ x1, x3, x4 \}$$

$$\text{set2} = \{ x2, x6 \}$$

$$\text{set3} = \{ x5, x7, x8, x9, x10 \}$$