CT→03 | Section A solve

Ans To The Q. No→ 1

At first we will normalize the table.
let, Low → 0, Medium → 0.5, High → 1

Sample No	Temperature	Humidity	Wind Speed
1	85/85 = 1	0.85/0.85 = 1	0
2	80/85 = 0.94	0.39/0.85 = 0.4	0.5
3	83/85 = 0.97	0.56/0.85 = 0.66	1
4	70/85 = 0.82	0.55/0.85 = 0.65	1
5	68/85 = 0.8	0.58/0.85 = 0.68	1

Iteration 1:

let

c_1 (1, 1, 0) // Center of Cluster 1

c_2 (0.8, 0.68, 1) // Center of Cluster 2

Sample No	Distance From Cluster 1	Distance From Cluster 2
1	$\sqrt{(1-1)^2+(1-1)^2+(0-0)^2}$ $= 0$	$\sqrt{(1-0.8)^2+(1-0.68)^2+(0-1)^2}$ $= 1.06$
2	$\sqrt{(0.94-1)^2+(0.4-1)^2+(0.5-0)^2}$ $= 0.78$	$\sqrt{(0.94-0.8)^2+(0.4-0.68)^2+(0.5-1)^2}$ $= 0.58$
3.	$\sqrt{(0.97-1)^2+(0.66-1)^2+(1-0)^2}$ $= 1.05$	$\sqrt{(0.97-0.8)^2+(0.66-0.68)^2+(1-1)^2}$ $= 0.17$
4	$\sqrt{(0.82-1)^2+(0.65-1)^2+(1-0)^2}$ $= 1.07$	$\sqrt{(0.82-0.8)^2+(0.65-0.68)^2+(1-1)^2}$ $= 0.036$
5.	$\sqrt{(0.8-1)^2+(0.68-1)^2+(1-0)^2}$ $= 1.06$	$\sqrt{(0.8-0.8)^2+(0.68-0.68)^2+(1-1)^2}$ $= 0$

So,

$C_1 = \{1\}$

$C_2 = \{2, 3, 4, 5\}$

Average of $C_1 = (1, 1, 0)$

Average of $C_2 = \left(\frac{0.94+0.97+0.82+0.8}{4}, \frac{0.4+0.66+0.65+0.68}{4}, \frac{0.5+1+1+1}{4}\right)$

$= (0.8, 0.59, 0.875)$

Iteration 2:

Sample No	Distance From Cluster 1	Distance From Cluster 2
1	$\sqrt{(1-1)^2+(1-1)^2+(0-0)^2}$ $=0$	$\sqrt{(1-0.8)^2+(1-0.59)^2+(0-0.875)^2}$ $=0.97$
2	$\sqrt{(0.94-1)^2+(0.4-1)^2+(0.5-0)^2}$ $=0.78$	$\sqrt{(0.94-0.8)^2+(0.4-0.59)^2+(0.5-0.$ $=0.44$
3	$\sqrt{(0.97-1)^2+(0.66-1)^2+(1-0)^2}$ $=1.05$	$\sqrt{(0.97-0.8)^2+(0.66-0.59)^2+(1-0.$ $=0.22$
4	$\sqrt{(0.82-1)^2+(0.65-1)^2+(1-0)^2}$ $=1.07$	$\sqrt{(0.82-0.8)^2+(0.65-0.59)^2+(1-0.87$ $=0.14$
5	$\sqrt{(0.8-1)^2+(0.68-1)^2+(1-0)^2}$ $=1.06$	$\sqrt{(0.8-0.8)^2+(0.68-0.59)^2+(1-0.$ $=0.15$

So,

$C_1 = \{1\}$

$C_2 = \{2, 3, 4, 5\}$

Ans