Date:

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Section C.

id	X_2	Y_2
1	1	~~1.5~~ 1
2	1.5	2
3	3	4
4	5	7
5	3.5	5
6	4.5	5
7	3.5	4.5

from initial iteration:

$$C_1 = (1.83, 2.33) \qquad C_2 = (4.1, 5.37)$$
$$x_1 \quad\; y_2 \qquad\qquad\quad x_1 \quad\; x_2$$

so

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

Iteration 2:

id	ED with C_1	ED with C_2	(group) min (C_1, C_2)
1	1.567	5.36	$C_1 \to 1.567$
2	0.466	4.256	$C_1 \to 0.466$
3	2.039	1.75	$C_2 \to 1.75$
4	5.01	1.86	$C_2 \to 1.86$
5	3.149	0.704	$C_2 \to 0.704$
6	3.77	0.544	$C_2 \to 0.544$
7	2.76	1.01	$C_2 \to 1.01$

now,

$$C_1 = \left(\frac{1 + 1.5}{2}, \frac{1 + 2}{2} \right) = (1.25, 1.5)$$

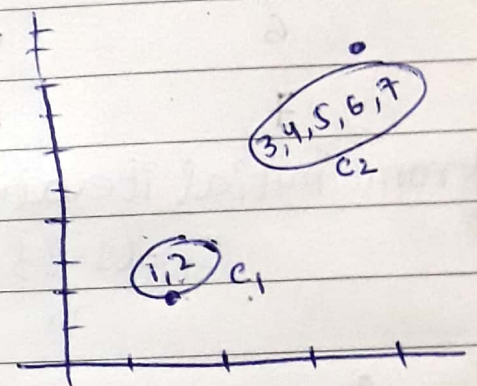$$C_2 = \left(\frac{3 + 5 + 3.5 + 4.5 + 3.5}{5}, \frac{4 + 7 + 5 + 5 + 4.5}{5} \right)$$

$$= (3.9, 5.1)$$

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Iteration 3:

id	ED with C₁	ED with C₂	group
1	0.56	5.02	$C_1 \rightarrow 0.56$
2	0.56	3.92	$C_1 \rightarrow 0.56$
3	3.05	1.42	$C_2 \rightarrow 1.42$
4	6.66	2.20	$C_2 \rightarrow 2.20$
5	4.16	0.41	$C_2 \rightarrow 0.41$
6	4.78	0.61	$C_2 \rightarrow 0.61$
7	3.75	0.72	$C_2 \rightarrow 0.72$

$$C_1 = \left(\frac{1+1.5}{2} , \frac{1+2}{2} \right) = (1.25, 1.5)$$

$$C_2 = \left(\frac{3+5+3.5+4.5+3.5}{5} , \frac{4+7+5+5+4.5}{5} \right) = (3.9, 5.1)$$

∴ The centroid values in this iteration are ~~prev~~ same as previous iteration so we'll stop here.