

Break & Quiz

Q 1.1: You have seven 2-dimensional points. You run 3-means on it, with initial clusters

$$C_1 = \{(2, 2), (4, 4), (6, 6)\}, C_2 = \{(0, 4), (4, 0)\}, C_3 = \{(5, 5), (9, 9)\}$$

Cluster centroids at the next iteration are?

- A. $C_1: (4,4)$, $C_2: (2,2)$, $C_3: (7,7)$
- B. $C_1: (6,6)$, $C_2: (4,4)$, $C_3: (9,9)$
- C. $C_1: (2,2)$, $C_2: (0,0)$, $C_3: (5,5)$
- D. $C_1: (2,6)$, $C_2: (0,4)$, $C_3: (5,9)$

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Q 1.2: We are running 3-means again. We have 3 centers, C_1 (0,1), C_2 (2,1), C_3 (-1,2). Which cluster assignment is possible for the points (1,1) and (-1,1), respectively? Ties are broken arbitrarily:

(i) C_1, C_1 (ii) C_2, C_3 (iii) C_1, C_3

- A. Only (i)
- B. Only (ii) and (iii)
- C. Only (i) and (iii)
- D. All of them

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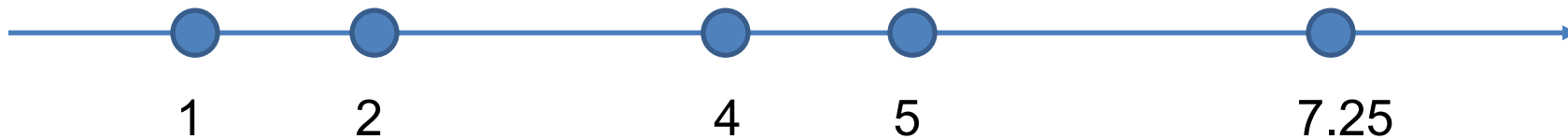
Q 1.3: If we run K-means clustering twice with random starting cluster centers, are we guaranteed to get same clustering results? Does K-means always converge?

- A. Yes, Yes
- B. No, Yes
- C. Yes, No
- D. No, No

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Q 2.1: Let's do hierarchical clustering for two clusters with average linkage on the dataset below. What are the clusters?

- A. $\{1\}, \{2, 4, 5, 7.25\}$
- B. $\{1, 2\}, \{4, 5, 7.25\}$
- C. $\{1, 2, 4\}, \{5, 7.25\}$
- D. $\{1, 2, 4, 5\}, \{7.25\}$



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Q 2.2: If we do hierarchical clustering on n points, the maximum depth of the resulting tree is

- A. 2
- B. $\log n$
- C. $n/2$
- D. $n-1$