7. The K-Means Algorithm: the Big Picture

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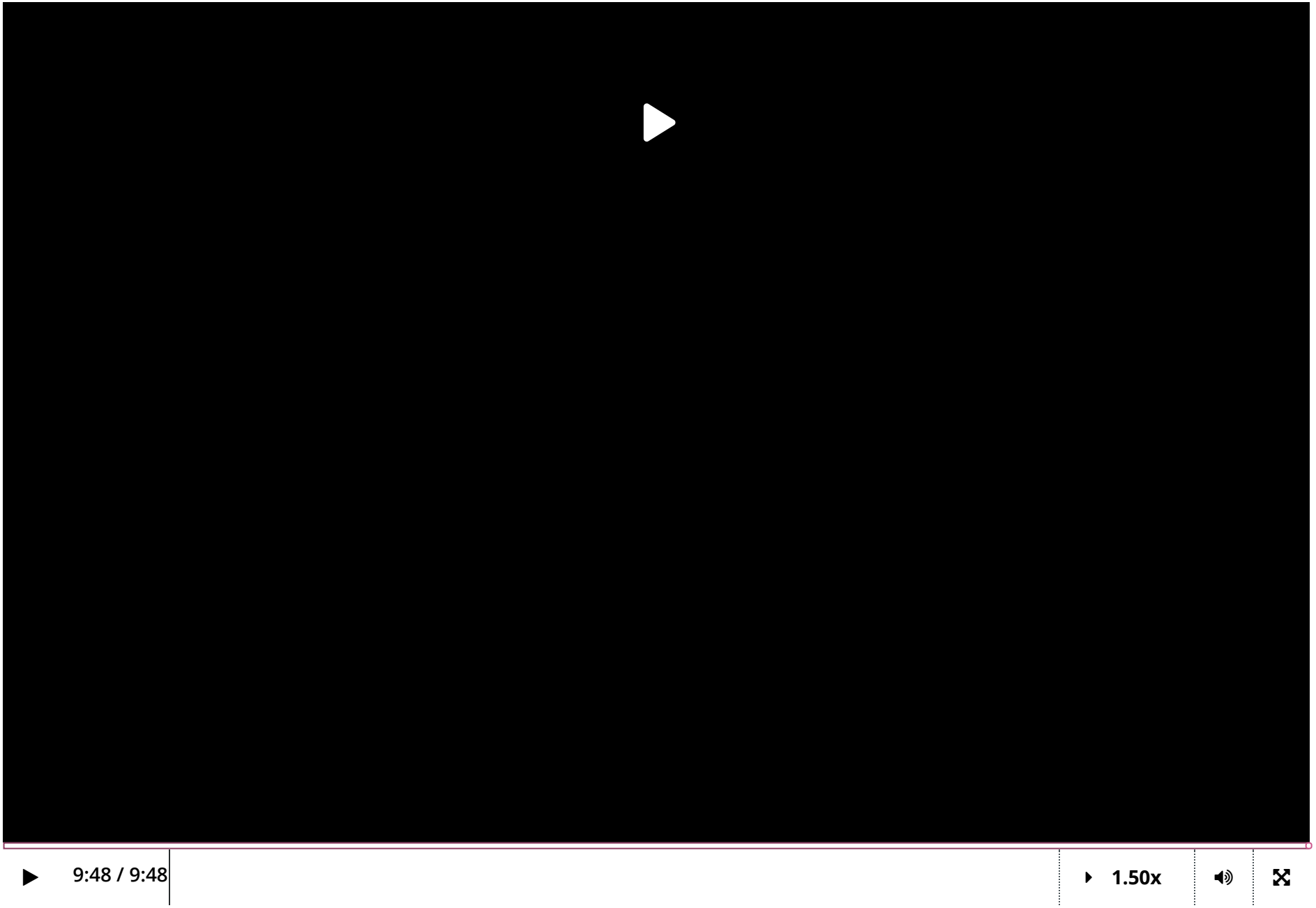
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Video

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The K-Means Algorithm: Step by Step

2/2 points (graded)

In the above lecture, given a set of feature vectors

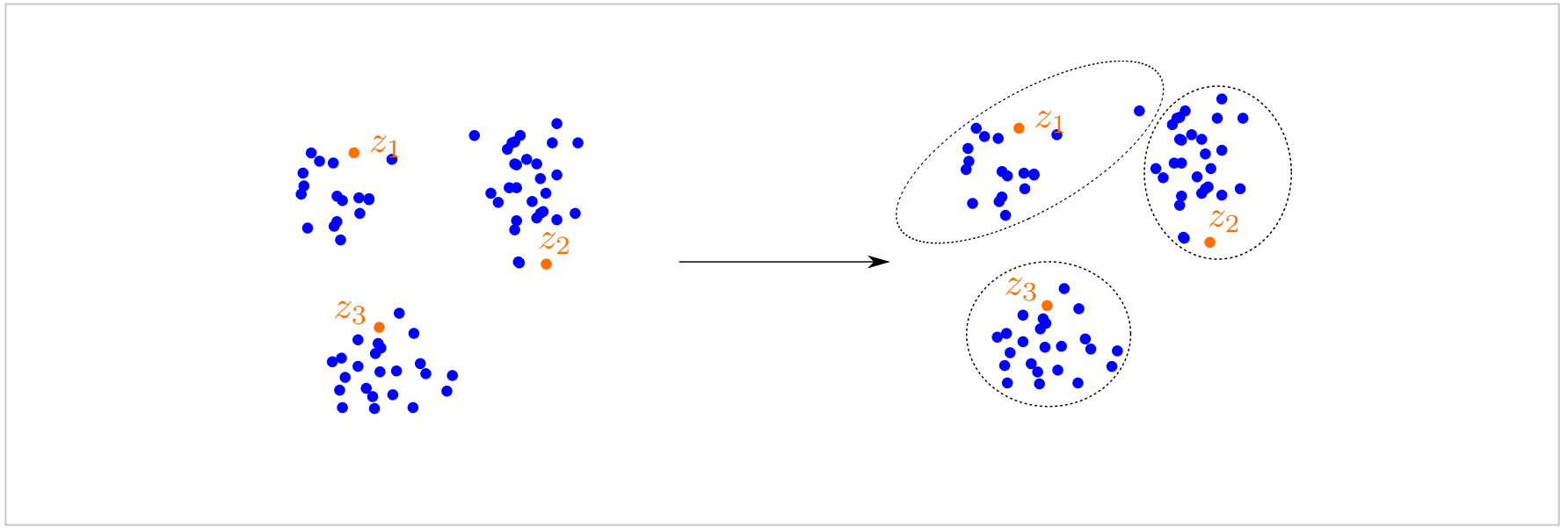
$$S_n = \{x^{(i)} | i = 1, \ldots, n\}$$

and the number of clusters k, we saw that we can use the K-Means algorithm to find reasonably good cluster assignments $C_1, \ldots, C_k$ and the representatives of each of the k clusters $z_1, \ldots, z_k$. The algorithm was given like the following:

1. Randomly select $z_1, \ldots, z_k$
2. Iterate
    1. Given $z_1, \ldots, z_k$, assign each $x^{(i)}$ to the closest z_j. i.e., assign each $x^{(i)}$.
    2. Given $C_1, \ldots, C_k$ find the best representatives $z_1, \ldots, z_k$ such that

$$\text{argmin}_{z_1,\ldots,z_k} \sum_{j=1}^{k} \sum_{i \in C_j} \|x^{(i)} - z_j\|^2$$

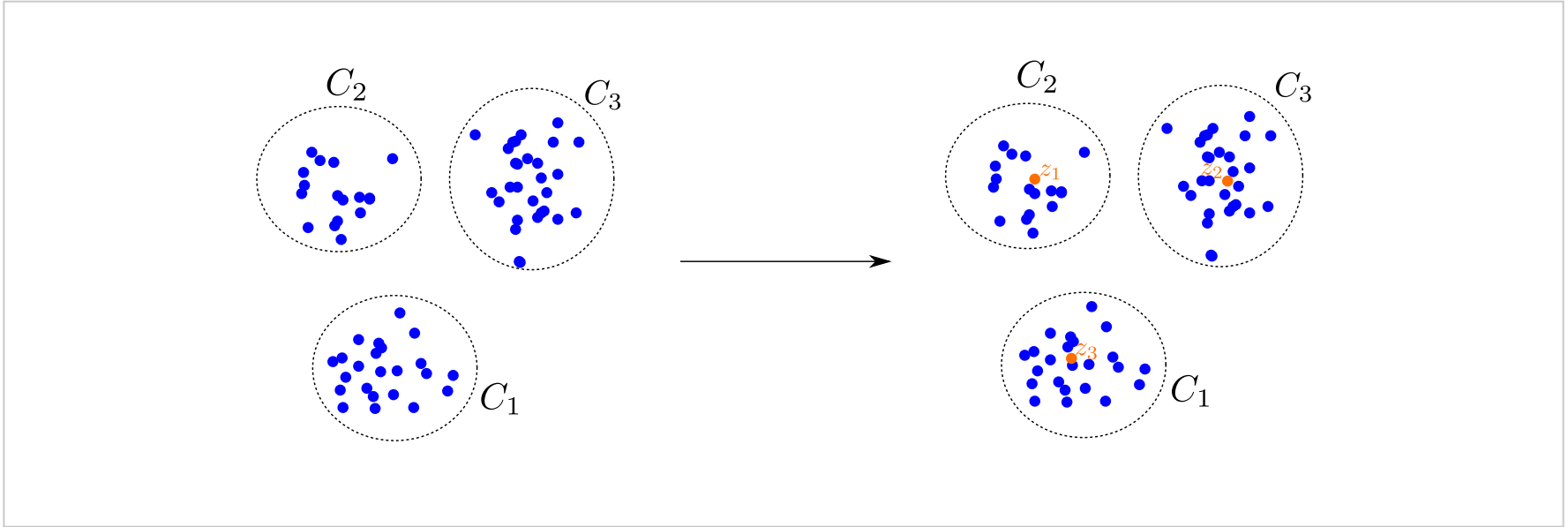
1. The following figure depicts an example of one of the steps of K-means algorithm:



Which is it?

- Step 1
- Step 2.1 ✔
- Step 2.2

The following figure depicts an example of one of the steps of K-means algorithm:



Which step is it?

- Step 2.1
- Step 2.2 ✔

Solution:

Step 2.1 assigns each points to the best cluster, while step 2.2 selects out the representative of each cluster. Note that step 1 is random initialization of cluster assignments.

Submit You have used 1 of 3 attempts

Answers are displayed within the problem

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