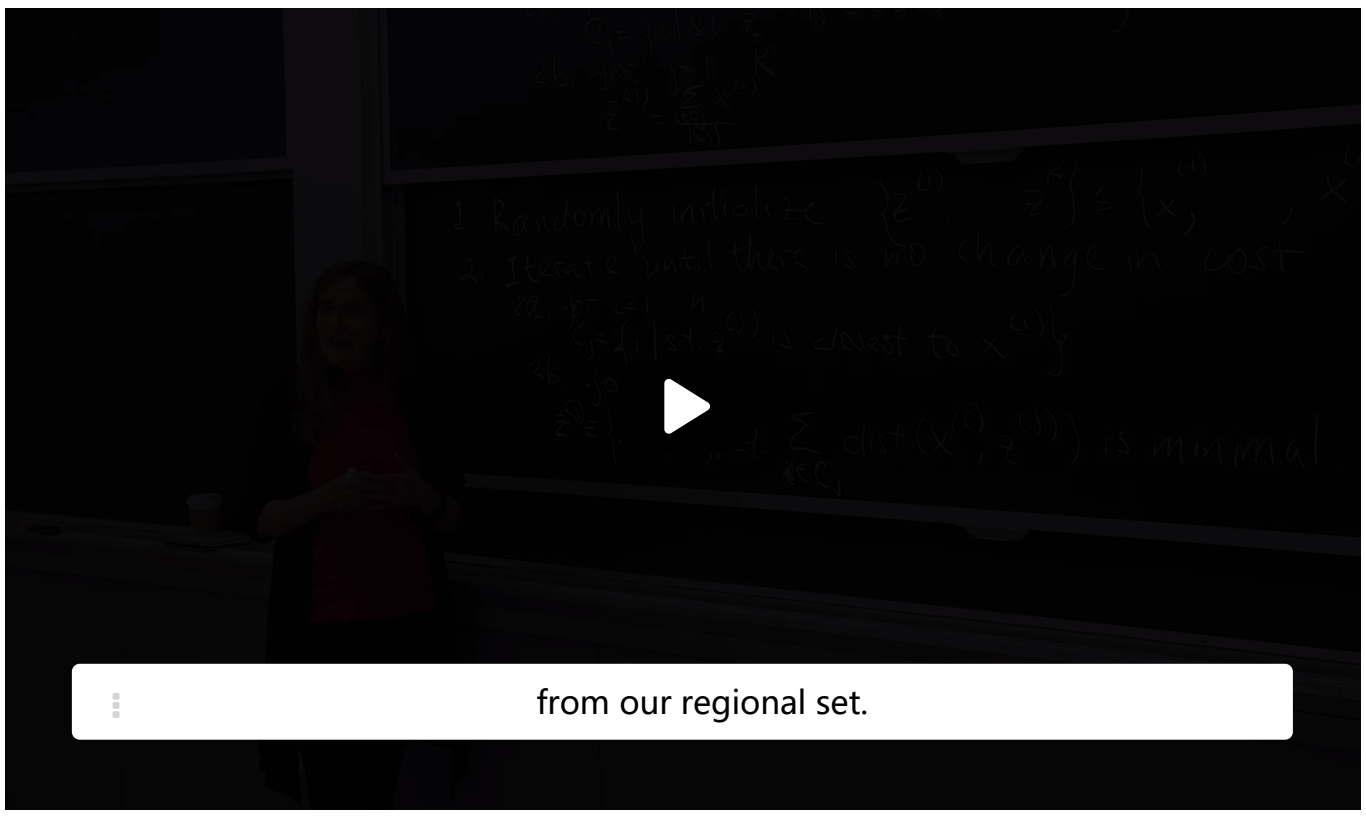
3. Introduction to the K-Medoids Algorithm
Introduction to the K-Medoids Algorithm



6:32 / 6:32 1.0x

because we explicitly are going to compute
the distances between these points and the rest.
So doing this algorithm, we for sure
can solve the two problems which were limiting
for us in the case of K-means.
We can work with any distance functions
as you can compute it.
And we also are guaranteed to get points
from our regional set.

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K-Medoids Algorithm as a Variation of K-Means

1/1 point (graded)
As explained in the lecture video, the K-Medoids algorithm is a variation of the K-Means algorithm that addresses some of the K-Means algorithm's limitations. The K-Medoids algorithm is given by

1. Randomly select $\{z_1, \ldots, z_K\} \subseteq \{x_1, \ldots, x_n\}$
2. Iterate
    1. Given $z_1, \ldots, z_K$, assign each $x^{(i)}$ to the closest z_j, so that

$$\text{Cost}\,(z_1, \ldots z_K) = \sum_{i=1}^{n} \min_{j=1,\ldots,k} \text{dist}\,(x^{(i)}, z_j)$$

    2. Given $C_j \in \{C_1, \ldots, C_K\}$ find the best representative $z_j \in \{x_1, \ldots, x_n\}$ such that

$$\sum_{x^{(i)} \in C_j} \text{dist}\,(x^{(i)}, z_j)$$

    is minimal.

Which part of the K-Medoids algorithm is **different** from its equivalent counterpart in the K-Means algorithm?

Part 2.1

Part 2.2 ✔

Solution:

As mentioned in the lecture, the k-medoids algorithm is another version of the k-means algorithm with line 2.2 changed so that

1. It is guaranteed that the K representatives $z_1, \ldots, z_K \in \{x_1, \ldots, x_n\}$
2. Line 2.2 finds cost-minimizing representatives $z_1, \ldots, z_K$ with any kind of cost measure

Submit You have used 1 of 1 attempt

Answers are displayed within the problem

Fact Check on the K-Medoids Algorithm

1/1 point (graded)
Which of the following is true about the K-Medoids algorithm? Choose all those apply.

- [x] It is always guaranteed that the K representatives $z_1, \ldots, z_K \in \{x_1, \ldots, x_n\}$ ✔
- [x] Line 2.2 of the algorithm(Given $C_j \in \{C_1, \ldots, C_K\}$ find the best representative $z_j \in \{x_1, \ldots, x_n\}$ such that...) finds the cost-minimizing representatives $z_1, \ldots z_K$ for any distance measure ✔

✔

Solution:

The K-Medoids algorithm is designed so that the two limitations of the K-Means algorithm are resolved.

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Answers are displayed within the problem

Discussion

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