Congratulations! You passed!

TO PASS 80% or higher

Keep Learning

GRADE 100%

Unsupervised Learning

LATEST SUBMISSION GRADE

100%

1. For which of the following tasks might K-means clustering be a suitable algorithm? Select all that apply. 1 / 1 point

- [ ] Given many emails, you want to determine if they are Spam or Non-Spam emails.
- [ ] Given historical weather records, predict if tomorrow's weather will be sunny or rainy.
- [x] Given a set of news articles from many different news websites, find out what are the main topics covered.

  Correct
  K-means can cluster the articles and then we can inspect them or use other methods to infer what topic each cluster represents

- [x] From the user usage patterns on a website, figure out what different groups of users exist.

  Correct
  We can cluster the users with K-means to find different, distinct groups.

2. Suppose we have three cluster centroids $\mu_1 = \begin{bmatrix} 1 \\ 2 \end{bmatrix}$, $\mu_2 = \begin{bmatrix} -3 \\ 0 \end{bmatrix}$ and $\mu_3 = \begin{bmatrix} 4 \\ 2 \end{bmatrix}$. Furthermore, we have a $x^{(i)} = \begin{bmatrix} -2 \end{bmatrix}$. 1 / 1 point

- [ ] Using the elbow method to choose K.
- [x] Move the cluster centroids, where the centroids μ_k are updated.

  Correct
  The cluster update is the second step of the K-means loop.

- [ ] Feature scaling, to ensure each feature is on a comparable scale to the others.
- [x] The cluster assignment step, where the parameters $c^{(i)}$ are updated.

  Correct
  This is the correst first step of the K-means loop.

  Correct
  This function is the distortion function. Since a lower value for the distortion function implies a better clustering, you should choose the clustering with the smallest value for the distortion function.

5. Which of the following statements are true? Select all that apply. 1 / 1 point

- [x] If we are worried about K-means getting stuck in bad local optima, one way to ameliorate (reduce) this problem is if we try using multiple random initializations.

  Correct
  Since each run of K-means is independent, multiple runs can find different optima, and some should avoid bad local optima.

- [ ] Since K-Means is an unsupervised learning algorithm, it cannot overfit the data, and thus it is always better to have as large a number of clusters as is computationally feasible.
- [x] For some datasets, the "right" or "correct" value of K (the number of clusters) can be ambiguous, and hard even for a human expert looking carefully at the data to decide.

  Correct
  In many datasets, different choices of K will give different clusterings which appear quite reasonable. With no labels on the data, we cannot say one is better than the other.

- [ ] The standard way of initializing K-means is setting $\mu_1 = \cdots = \mu_k$ to be equal to a vector of zeros.