Unsupervised Learning

Quiz, 5 questions

1 point	
	ich of the following tasks might K-means clustering be a suitable nm? Select all that apply.
	Given historical weather records, predict if tomorrow's weathe will be sunny or rainy.
	From the user usage patterns on a website, figure out what different groups of users exist.
	Given many emails, you want to determine if they are Spam or Non-Spam emails.
	Given a set of news articles from many different news websites, find out what are the main topics covered.

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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 training example $x^{(i)}=\begin{bmatrix} -2\\1 \end{bmatrix}$. After a

cluster assignment step, what will $c^{(i)}$ be?

- $c^{(i)} = 1$
- $c^{(i)}$ is not assigned
- $c^{(i)} = 2$
- $c^{(i)} = 3$

1 point

3.

K-means is an iterative algorithm, and two of the following steps are repeatedly carried out in its inner-loop. Which two?

Feature scaling, to ensure each feature is on a comparable
scale to the others

- The cluster assignment step, where the parameters $c^{(i)}$ are updated.
- Move the cluster centroids, where the centroids μ_k are updated.
- Using the elbow method to choose K.

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4.

Suppose you have an unlabeled dataset $\{x^{(1)},...,x^{(m)}\}$. You run K-means with 50 different random

initializations, and obtain 50 different clusterings of the

data. What is the recommended way for choosing which one of

these 50 clusterings to use?

0	Compute the distortion function $J(c^{(1)},,c^{(m)},\mu_1,,\mu_k)$, and pick the one that minimizes this.
\bigcirc	Use the elbow method.
0	Plot the data and the cluster centroids, and pick the clustering that gives the most "coherent" cluster centroids.
\bigcirc	Manually examine the clusterings, and pick the best one.

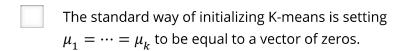
1 point

5.

Which of the following statements are true? Select all that apply.

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.

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.



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.

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