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1. K-means and K-medoids

Extension Note: Homework 5 due date has been extended by 1 day to **August 17 23:59UTC** .

Assume we have a 2D dataset consisting of $(0, -6)$, $(4, 4)$, $(0, 0)$, $(-5, 2)$. We wish to do k-means and k-medoids clustering with $k = 2$. We initialize the cluster centers with $(-5, 2)$, $(0, -6)$.

For this small dataset, in choosing between two equally valid exemplars for a cluster in k-medoids, choose them with priority in the order given above (i.e. all other things being equal, you would choose $(0, -6)$ as a center over $(-5, 2)$).

For the following scenarios, give the clusters and cluster centers after the algorithm converges. Enter the coordinate of each cluster center as a square-bracketed list (e.g. `[0, 0]`); enter each cluster's members in a similar format, separated by semicolons (e.g. `[1, 2]; [3, 4]`).

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Cluster 1 Center: [4, 4] ✔ **Answer:** [4, 4] **

Cluster 1 Members: [4, 4]; [-5, 2] ✔ **Answer:** [4, 4]; [-5, 2] **

Cluster 2 Center: [0, -6] ✔ **Answer:** [0, -6] **

Cluster 2 Members: [0, -6]; [0, 0] ✔ **Answer:** [0, -6]; [0, 0] **

Solution:

- First we will (arbitrarily) assign $(-5, 2)$ to cluster 1, and $(0, -6)$ to cluster 2 **(**note that your solution may have these assignments flipped!)**
- Then, we update the clusters to be $[\mathbf{(4,4)}, (-5, 2)]$ and $[\mathbf{(0,-6)}, (0, 0)]$.
- At this point we have converged.

You have used 1 of 3 attempts

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Clustering 2

4.0/4 points (graded)

K-medoids algorithm with l_2 norm.

Cluster 1 Center: [0, 0] ✔ **Answer:** [0, 0] **

Cluster 1 Members: [4, 4]; [0, 0]; [-5, 2] ✔ **Answer:** [4, 4]; [-5, 2]; [0, 0] **

Cluster 2 Center: [0, -6] ✔ **Answer:** [0, -6] **

Cluster 2 Members: [0, -6] ✔ **Answer:** [0, -6] **

Solution:

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- At this point, we will have converged.

Submit You have used 1 of 3 attempts

Answers are displayed within the problem

Clustering 3

4.0/4 points (graded)

K-means algorithm with l_1 norm

Cluster 1 Center: [-0.5, 3] ✔ **Answer:** [-0.5, 3] **

Cluster 1 Members: [4, 4];[-5, 2] ✔ **Answer:** [4, 4]; [-5, 2] **

Cluster 2 Center: [0., -3] ✔ **Answer:** [0, -3] **

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Solution:

- First we will assign $(-5, 2)$ to cluster 1, and $(0, -6)$ to cluster 2. **(**note that your solution may have these assignments flipped!)**
- Then, we update the clusters to be $[(4, 4), (-5, 2)]$ with center $(-0.5, 3)$.
- We update $[(0, -6), (0, 0)]$ with center $(0, -3)$.
- At this point, we will have converged.

Submit You have used 1 of 3 attempts

Answers are displayed within the problem

Discussion

Topic: Unit 4 Unsupervised Learning (2 weeks) :Homework 5 / 1. K-means and K-medoids

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Clustering 3

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Manhattan distance Whenever we're asked to use l1 norm, or manhattan distance, shall we always assume to sum the coordinates but never take the sqrt() ?	1
Clustering 1 I'd like to discuss Clustering 1 before moving to the final exam. Initially I input (-5,2) as the center of the first cluster. Then I got correct cluster me...	3
[Staff] How to update cluster center in K-medoids Hi Staff, Could you please explain how the cluster center has to be update in K-medoids?. I can't find an example in internet, just "PAM Algortihm...	3
Closed again before deadline? [STAFF] Hey there We got an update email saying that lectures 14-16 would be open until 11:59 UTC today, but now they closed earlier again? Could we g...	4
L1 norm and L2 norm? I am a bit confused about clustering questions. In the lecture we talked about the different similarity functions, but we never talked about l1 or l2...	4
My certificate is officially mine! I'm a little sad that I rushed to get it with homework problems (because they're worth more than lecture exercises) instead of finishing the last tw...	11
[staff] Lecture 13-16 Extension not reflected Hi, I received e-mail from you that the deadline of unit 4 has been be extended for 1 day including Lecture 13-16. But the deadline for lecture 13-...	3
Extension for this homework by 1 day please!!! could you give us an extension by 1 day for this homework, please?	58
Grader 1 and 3 bug? My answers in Q1 and Q3 of class members are green, but both centers are red. Is it possible? In Q2 everything is green.	12
KMeans/KMedoid with L1/L2 distance on a dataset	

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