



[Unit 4 Unsupervised Learning \(2](#)
[Course](#) > [weeks](#))

> [Homework 5](#) > 1. K-means and K-medoids

Audit Access Expires May 11, 2020

You lose all access to this course, including your progress, on May 11, 2020.

1. K-means and K-medoids

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. $[1, 2]; [3, 4]$).

Clustering 1

4.0/4 points (graded)

K-medoids algorithm with l_1 norm.

Cluster 1 Center:

✓ Answer: $[4, 4]$ **

Cluster 1 Members:

✓ Answer: [4, 4]; [-5, 2] **

Cluster 2 Center:

✓ Answer: [0, -6] **

Cluster 2 Members:

✓ 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 $[(4, 4), (-5, 2)]$ and $[(0, -6), (0, 0)]$.
- At this point we have converged.

You have used 1 of 3 attempts

i Answers are displayed within the problem

Clustering 2

4.0/4 points (graded)

K-medoids algorithm with l_2 norm.Cluster 1 Center:

✓ Answer: [0, 0] **

Cluster 1 Members:

✓

Answer: [4, 4]; [-5, 2]; [0, 0] **

Cluster 2 Center:

✓ Answer: [0, -6] **

Cluster 2 Members:

✓ Answer: [0, -6] **

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 $[(4, 4), (-5, 2), (0, 0)]$ and $[(0, -6)]$.
- At this point, we will have converged.

You have used 2 of 3 attempts

i Answers are displayed within the problem

Clustering 3

4.0/4 points (graded)

K-means algorithm with l_1 normCluster 1 Center:

✓ Answer: [-0.5, 3] **

Cluster 1 Members:

✓ Answer: [4, 4]; [-5, 2] **

Cluster 2 Center:

✓ Answer: [0, -3] **

Cluster 2 Members:

✓ Answer: [0, -6]; [0, 0] **

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 2 of 3 attempts

i Answers are displayed within the problem

Discussion





[Hide Discussion](#)










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

[Add a Post](#)

Show all posts

by recent activity

- | | |
|---|---|
|  missing information | 2 |
| Although you told us how to resolve choosing a center when the sum of distances to points i... | |
|  Problem with last problem (Clustering 3) | 2 |
| One of my clusters contains a single point. My answer to "Cluster X Members" is marked as c... | |
|  [STAFF] EdX technical difficulties, request extension | 2 |
| I have been having technical difficulties with EdX all day. It is impossible for me to watch any l... | |
|  [STAFF] extension - exam deadline micromaster | 4 |
| Dear Staff, can you give us a little extension, please ? The deadline coincide exactly with exam... | |

	[STAFF] Extension for HW by 2 days	5
	I request the staff to extend deadline of this home work by 2 days as this week involved 4 lect...	
	[Curiosity] How did you solve the problems in this page ?	9
	Just for curiosity, how did you solve the problems in this page ? : - by pen and paper only - by...	
	Community TA	
	[STAFF] Error:Could not format HTML for problem. Contact course staff in the discussion forum for assistance.	2
	Hi There, I am getting this error when trying to input the answers. Please help.	
	What is meant by l1 and l2 norms?	4 new_ 8
	I don't remember clustering lectures discussing l1 and l2 norms. What is meant by them?	
	[Resolved] First problem on this page has disappeared for me ("Could not format HTML")	2
	I can't see the first problem on this page anymore; instead I get this message: "Could not for...	
	how to find derivative of l1 norm?	14
	hi I have submitted answer using revised centers as mean of the elements in respective clust...	
	How are we supposed to choose the center in clustering 3?	9
	Clustering 1: the center	5

© All Rights Reserved