Homework Assignment 6 [30 points]

STAT430 Unsupervised Learning - Fall 2021

Due: Friday, October 8 on Compass at 11:59pm CST.
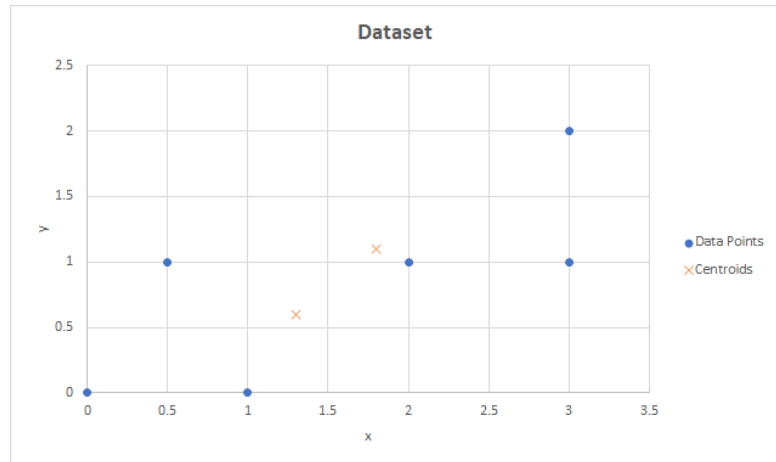
Problem	Points
1	0.5
2.1	0.25
2.2	2
2.3	1.5
2.4	1
3.1	1
3.2	3
4	0.5
5.1	0.75
5.2	0.75
5.3	0.75
5.4	0.75
5.5	1
6.1	1.5
6.2	2
6.3	0.5
6.4	1
6.5	1.5
6.6	0.75
6.7	0.5
6.8	1
6.9	0.75
6.1	1
6.11	1
6.12	1.5
6.13	0.5
7	2.5

Questions #1-#6: Answer the questions in the jupyter notebook.

Question #7:

We would like to cluster the dataset below using Fuzzy c-Means using $c = 2$ clusters and $p = 3$. The *current* centroids for the two cluster are (1.3, 0.6) and (1.8, 1.1). In the second table below, we have provided the squared distance that each object is to each of the *current* centroids. Determine what the *new* centroids will be in the next iteration of the algorithm. Show your work.

	Dataset	
	x	y
Object 1	0	0
Object 2	1	0
Object 3	0.5	1
Object 4	3	1
Object 5	3	2
Object 6	2	1

Dataset

	Additional Information	
	Squared Distance to Centroid 1 (1.3, 0.6)	Squared Distance to Centroid 12 (1.8, 1.1)
Object 1	2.05	4.45
Object 2	0.45	1.85
Object 3	0.8	1.7
Object 4	3.05	1.45
Object 5	4.85	2.25
Object 6	0.65	0.05