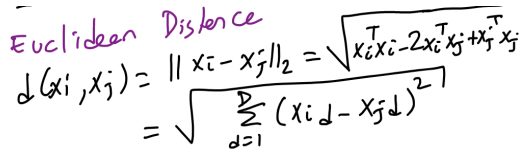
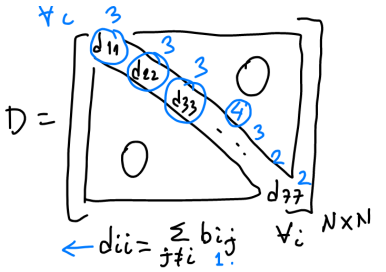
Engr 421 – HW #6 Report

Firstly, I defined three functions for updating the centroids, memberships, and plotting the current state. These functions are taken from the lab.



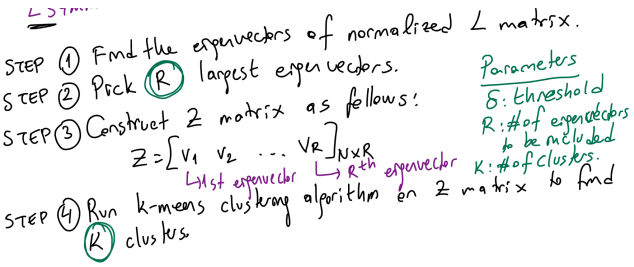
I constructed the B matrix by using the Euclidean distance formula above. Then, I plot the connectivity matrix to show connected data points.

I calculated D and L matrices using the following formulas.



$$\mathbf{L}_{symmetric} = \mathbf{I} - \mathbf{D}^{-1/2}\mathbf{B}\mathbf{D}^{-1/2}$$

I applied following steps where R = 5 smallest eigenvectors and K = 5. Using these eigenvectors, I constructed Z matrix. I initalized the centroids as the 85, 129, 167, 187, and 270th rows of Z matrix.



Lastly, I run k-means clustering algorithm on Z matrix and plot the clustering result. Formulas above are taken from the lecture notes.