ENGR 421 / Homework 6: Spectral Clustering

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In homework 6, we are given 300 2-dimensional data points. We are asked to implement spectral clustering algorithm with 5 eigenvectors that corresponds to 5 smallest eigenvalues.

First, I calculated B and D matrices and draw a line between the connected points. The corresponding plot:

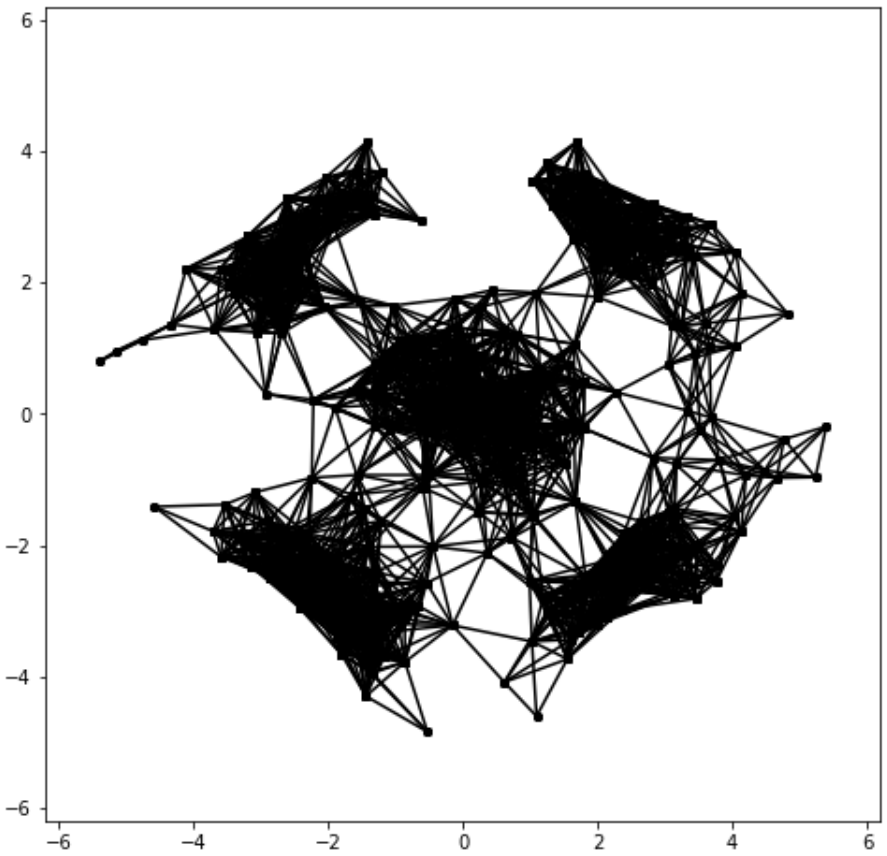

Figure 1: Connected points

I used the $L_{symmetric}$ formula to obtain the L matrix and then found the first 5 eigenvectors of L matrix and put them in Z matrix. Then, I run k-means clustering on Z matrix to find 5 clusters. In the initialization of k-means clustering, initial centroids were 85th, 129th, 167th, 187th, and 270th rows of Z matrix. At the end of the algorithm, I had the following clusters:

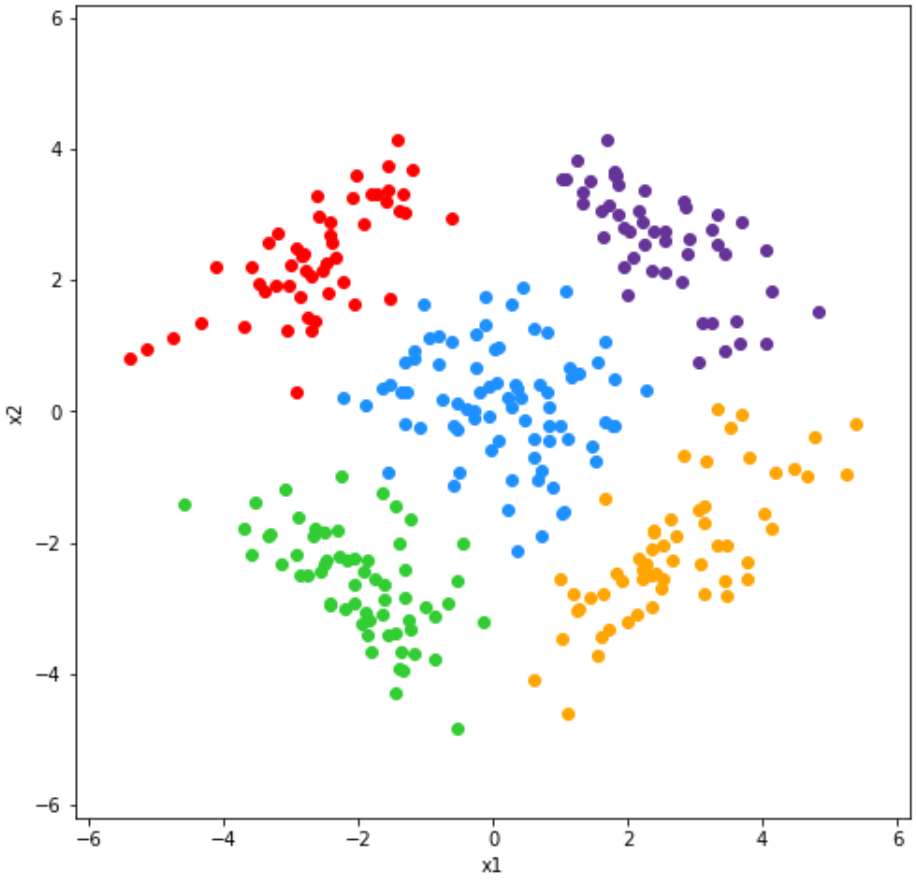

Figure 2: Final plot