Problem 2

we can take advantage of the power of eigenvectors and eigenvalues to cluster/group the data based on their relationships of each other(in this case, the relationship is represent in matrix fr. We can further change the matrix fr to other representation. For instance, each (i, j) in the matrix can now represents the similarity between i, j. Then, the variety measurement of similarity lead to more interesting applications. There are lots of interesting algorithm similar to this problem such as K-means clustering and spectral neighborhood algorithm.