The Program contains two files namely start.m & clusterify.m

**Start.m –** Specify number of nodes in the graph and the number of clusters to be formed.

It is used to call clusterify with the two parameters being the adjacency matrix of the graph and the number of clusters.

**Clusterify.m –** Makes clusters out of the graph using one of the given techniques.

**To run the program:**

1. **Give proper values to**
2. **N- number of vertices in the graph**
3. **K- number of clusters in the graph**
4. **Build the adjacency matrix (currently a random matrix is created)**
5. **Run the file start.m**

**Runtime:**

**If the graph contains n nodes then**

1. **Computing the laplacian matrix takes O(n) time.**
2. **Finding eigenvectors takes O(n3)**
3. **K means algorithm takes O(tnk2)**

**Total runtime being O(n3)**

**Q2. The majority of the time of the algorithm goes into finding eigenvectors for the matrix. However, for sparse graphs better ways to find eigenvectors exist. One of the algorithm being Lanczos algorithm which computes eigen vectors in O(n2) time.**