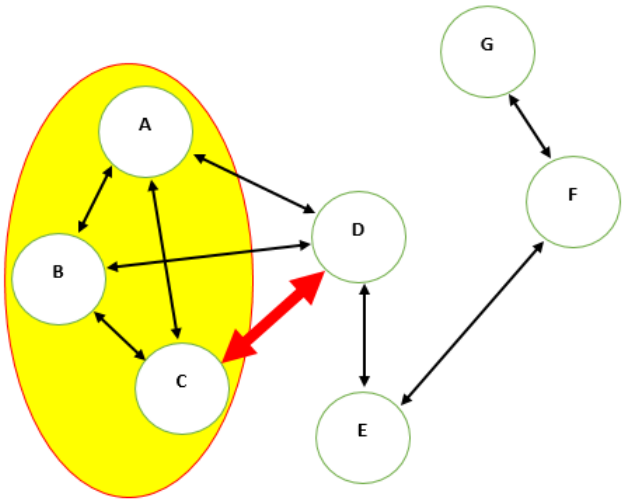
The Clique Problem

Reference: https://en.wikipedia.org/wiki/Clique_problem

This program is used in calculating the maximum clique in a group. (A clique is a subset of people who all know each other)

One of its major application is in **Social Networking** for discovering and suggesting mutual friendship.

Sample Illustration:



A, B and C all know each other (Clique). A and B also know D which signifies a high probability of C knowing D.

This program uses brute force algorithm on the adjacency matrix of the graph.

Problem Sample:

Using file.txt as sample input

8	Number of Vertices (Number of persons)
11	Number of Edges (Number of connections)
1 bob 2 tom 3 george 4 john 5 mary 6 sally 7 jane 8 allice	List of persons in the entire graph
1 2 2 3 3 4 4 5 2 6 2 7 3 6 3 7 6 7 6 8 7 8	**Connection breakdown** **(i.e 1 2 means 1 knows 2 or simply bob knows tom** **2 3 means 2 knows 3 or simply tom knows george)**

Output:

```
run:
Vertices: 8
Edges: 11

Minimum Degree: 1
Maximum Degree: 4
Average Degree: 2.75


Average shortest path length: 1.96
Longest shortest path length: 4

Maximum clique size: 4
Maximum clique members:
         2 tom
         3 george
         6 sally
         7 jane
BUILD SUCCESSFUL (total time: 0 seconds)
```