LAB 7, Due: 31-March

1. Applications of BFS

   - Design an efficient algorithm to test whether a graph contains a C_3. Similarly, test for C_4.

   - Write an algorithm to list all C_3 and C_4 in a graph.

   - Give an undirected edge weighted graph, using BFS as a black box, design an algorithm to find shortest paths from a fixed vertex (source) to all other vertices.

2. Applications of DFS

   - Write an efficient algorithm $(\theta(n))$ to list all articulation points and bridges in an undirected graph.

   - Can we use DFS to list all biconnected components. If so, exhibit an approach.

3. Applications of BFS/DFS

   - Given a graph, how do you find a shortest cycle (a cycle with the least number of vertices)

   - A connected graph is 3-connected, if removal of some 3 vertices disconnects the graph into 2 or more connected components. Design an algorithm to test whether a graph is 3-connected or not.