1. Write a method to generate random weighted undirected graphs. The user must input the following data items:
   a. Number of vertices
   b. Number of edges
   c. The maximum weight for each edge (assume weights are integers, and the minimum weight is 1)
   d. Whether to use an adjacency list or an adjacency matrix representation

Make sure that your program does not generate repeated edges or self-edges.

2. Write methods to implement the following algorithms, allowing both adjacency list and adjacency matrix representations, using randomly generated graphs
   a. Determining if an undirected graph has a cycle
   b. Counting the connected components of an undirected graph
   c. Kruskal’s minimum spanning tree algorithm
   d. Dijkstra’s shortest paths algorithm.

Implement your own union/find data structure and operations.

3. As usual, write a report describing your results.