Report
Assignment 1

Name - Parul Bansal
Roll No - B14116

Question 1

- In this problem we used Priority Queue data structure to find a stable set of engagements . Here we used Gale-Shapley algorithm for stable matching among men and women.
- Time Complexity of this algorithm is O(n^2logn).
- The code takes input from 'a1.in' input file where preference of men and women are given by the user. The first line contains number of men or women. From second line there is a matrix of n*n which represents the preference of men. And then there is another matrix of n*n representing the preference of women .
- In this algorithm, the sequence of partners to which w is engaged gets better and better in terms of her preference lists.
- In this algorithm, the sequence of women to whom m proposes gets worse and worse in terms of his preference lists.

Question 2

- In this problem, we can use DFS to detect whether a given undirected graph contains a cycle or not .
- Time complexity of this algorithm is O(m+n) where m is number of edges and n is number of vertices of graph.

- The code takes input from 'a2.in' input file where first line represents number of vertices (n) and edges (m) in the graph. For next m lines, there is a pair of vertices that are adjacent to each other.

Question 3

- In this problem, we can use BFS to find whether hero can reach captive or not. If hero is able to reach captive, we have to find the minimum number of jumps he should do .

- BFS helps in computing the shortest paths from source node to other nodes .

- Time complexity of this algorithm is O(m+n) where m is number of edges and n is number of vertices of graph.

- The code takes input from 'a3.in' input file represent in the same way as described in the question .