Greedy Algorithms - Exercise

1. Given a graph with edges having non-negative weights and a source vertex ‘s’, implement the Dijkstra’s algorithm to find the shortest distance to reach all the other vertices from s.
   Function Prototype: int* dijkstra(int graph[][], int s);

2. Given a graph with edges having non-negative weights, implement the following algorithms to determine the minimum spanning tree:
   a) Prim’s
   b) Kruskal’s

   Function Prototype: int** msp(int graph[][]);

3. In a board game named “business”, at any instant of time, each player and a banker has a certain number of coins in each denomination. When a player wishes to buy a property, he gives an amount greater than or equal to the value of the property. In return, the banker the tenders the remainder to complete the transaction. Given an array of the various denominations, an array of the number of coins available in each denomination, the value of the property and the amount given by the player, implement an algorithm to aid the banker in returning the remainder with the least number of coins by outputting the number of coins in each denomination to be returned by the banker.
   Function Prototype: int* getRemainder(int D[], int N[], int v, int a);

   Sample:

   Input: D[] = {100, 500, 1000, 5000, 10000}, N[] = {5, 10, 2, 4, 3}, v = 5500, a = 10000

   Output: {0, 5, 2, 0, 0}