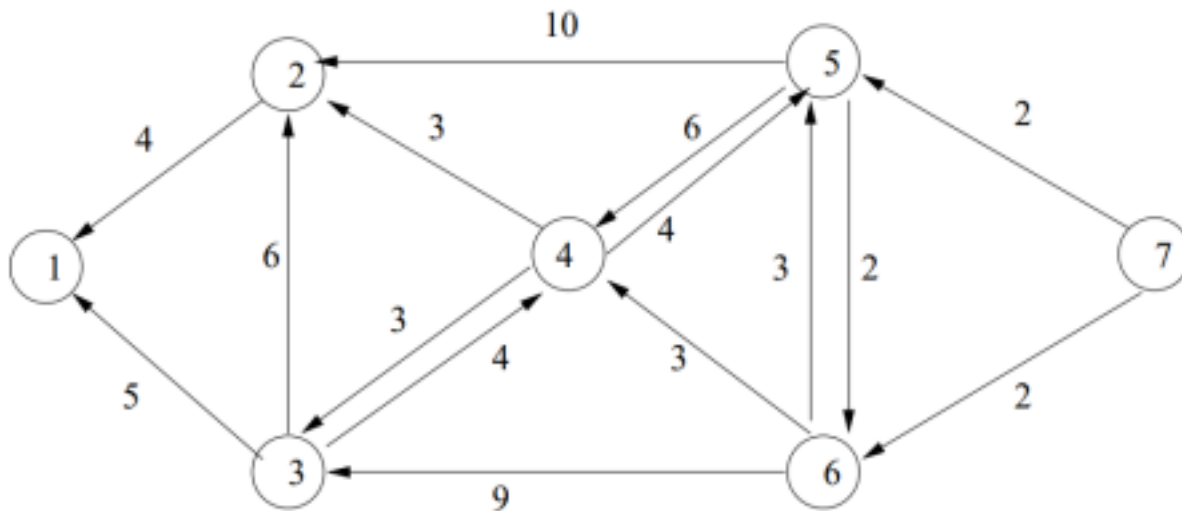


### INSTRUCTIONS

1. ALL Four PROBLEMS are COMPULSORY
2. Carefully read all assignment problems.
3. Write only a single main function. You can call the required functions from the main function. Print the list of elements wherever necessary.
4. Name the file as follows: **S2021xxxxx A11.c**
5. DO NOT zip. Upload a single .c file directly to your submission in the common Google classroom.
6. **Don't share or copy the codes. If malpractice is found, you will be awarded Zero.**



### Problem: 1

For the above given Graph G1, use DijkStra's algorithm to find the shortest path from vertex 7 to all other vertices using an adjacency list, **print a shortest path from the source to each other vertex as below.**

**“Shortest path to 4: 7 6 4: cost = 5”**

## Problem: 2

For the given input description of Graph G1 below, write Bellman-ford algorithm to find the **shortest path from the source vertex 1 to remaining vertices**. **Read the note given carefully and write the program to read input of the graph (in the format like below) and process, print the output as mentioned in Problem 1.**

Input:

```
10
3 6 4 9 0 7 8
8 5 3 7 3 4 -2
5 10 2 8 1 4 1
2 6 -3 1 3 7 1
1 10 -1 2 2 4 -2
10 9 -3 1 3 7 2 5 1
7 3 0 10 1 2 1 8 2
9 6 6 3 4 10 7
4 8 5 1 9 5 6
6 2 4 3 0 9 0
```

Note:

- The first line of the description contains  $n$ , the number of vertices of  $G$ . The names of the vertices are the integers from 1 to  $n$ .
- Each remaining line of the input is the description of the graph; is a list of integers separated by spaces, and represents the list of out neighbors of one vertex.
- The first number in the line is the name of the vertex.
- After that, there is a sequence of pairs, consisting of an out vertex name and its associated weight.
- For example, the third line of the input description,  
3 6 4 9 0 7 8  
indicates that there is an edge from 3 to 6 of weight 4, an edge from 3 to 9 of weight 0, an edge from 3 to 7 of weight 8.