**SET-B**

**CSE221 - Lab Final Exam**

**Duration: 70 Minutes | Total Marks: 20**

Barbie desires to leave Barbie World and enter the real world. Although there are numerous ways to go there and it is a long way away, Barbie wants to get there as soon as she can. There are a number of magical cities she needs to visit on her way to the real world. However, the journey will not be simple. Barbie needs your assistance to locate the quickest route from Barbie World to Real World.

The map showed a directedgraph of magical cities, numbered from ***1*** to ***N***, with ***M*** roads connecting them. Additionally, the time it takes to get from one city to another is also determined. ***Assume that Barbie World is vertex 0 and Real World is vertex 5.***

Now, you have to help Barbie to reach her destination.

1. Take file input.
2. Create a graph using Adjacency List.
3. Find the number of possible paths from Barbie World to Real World.
4. calculate the shortest path and minimum amount of time to reach the ***Real World*** from ***Barbie World***.

**See the input output format for better understanding.**

| **Marks Distribution** | **Allocated Points** |
| --- | --- |
| Taking input from a text file | 2 points |
| Showing the output in a text file | 2 points |
| Making graph and show the adjacency list  *[* ***1*** *mark will be redacted if the output format doesn’t match.]* | 3 + 2 = 5 points |
| Correct Output B | 3 Points |
| Correct Output C | 6 points |
| Correct Output D | 2 Points |

**Input**

The first line contains two integers ***N*** and ***M*** (1 ≤ N ≤ 104, 1 ≤ M ≤ 106), which are the number of places and the number of connections between the places.

Then, ***M*** lines describe the roads on the map. The i-th of them contains three integers ***ui***, ***vi*** and ***Ci***( 1 ≤ ui,vi ≤ 106) which denote the endpoints of the roads and amount of time to travel the road. **Please note that the graph is directed.**

**Output**

You should show four outputs.

**Output A:** Show the **Adjacency List** of the graph.

**Output B:** Print the **number of possible Paths** from Barbie World to Real World

**Output C:** Print the **shortest path** from Barbie World to Real World.It is guaranteed that there exists at least one path from BarbieWorld to RealWorld.

**Output D:** Print the **minimum amount of time** required to travel from Barbie World to Real World.

**Sample Input Output**

| **Sample Input 1** | **Sample Output** |
| --- | --- |
| 8 13  0 3 2  0 4 6  1 0 7  1 3 5  1 5 8  1 6 2  2 4 1  2 5 1  3 1 5  3 5 7  3 7 5  5 7 8  7 5 1 | **Output A:**  0: 3->2 , 4->6  1: 0->7, 3->5, 5->8, 6->2  2: 4->1, 5->1  3: 1->5, 5->7, 7->5  4:  5: 7->8  6:  7: 5->1  **Output B:**  Total 7 paths  **Output C:**  0->3->7->5  **Output D:**  8 Unit Time |