CSI3108-01 2018. 11. 02

Programming HW#4

Max 30 points
Due on Nov. 12(Mon) 2018, by 5pm

In this programming assignment you are given a network to find a maximum flow. You should implement the *Edmond-Karp algorithm* discussed in the class to find a maximum flow in the given network.

[Constraints]

- The number of nodes in a network is at most 1,000.
- The number of edges in a network is at most 10,000.
- The capacity of an edge is not greater than 100.

[Input]

The test cases consist of the following format. In the first line, the number of test cases is given. From the next line, each test case consists of n+1 lines. In the first line, the number of nodes, source node, and destination node are given. In the next n lines, the 2-dimensional array of a network is given row-by-row, one row per line. The elements of array are the capacity of edges. In the array, element of i th row and j th column is the capacity from node i to node j.

[Output]

Print out the value of the maximum flow in the each network of the test cases on a separate line, starting with '#x', where x is the case number.

[Sample Input and Output]

Input

20	← a number of test case
6 0 5	← test case 1, the number of nodes : 6, source node : 0, destination node: 5
0 5 10 0 0 0	
0 0 0 5 5 0	
0 0 0 5 5 0	
0 0 0 0 0 15	
0 0 0 0 0 5	
0 0 0 0 0 0	
6 1 3	← test case 2, the number of nodes : 6, source node : 1, destination node: 3

```
0 0 10 0 0 12
16 0 13 0 0 0
4 0 0 0 14 0
0 0 0 0 0 0
0 0 0 4 0 7
0 0 9 20 0 0
```

Output

```
#1 15
#2 23
```