

Maximum Flow

The Problem

Given a network which has a single source vertex with no in edges and a single destination (sink) vertex with no out edges, compute the maximum flow capacity for the network.

The Input

The first line contains the number of test cases T ($T \leq 250$).

The first line of each test case contains 4 integers – N , E , S and D . N is the number of vertices in the network, $2 \leq N \leq 1000$. E is the number of directed edges in the network, $1 \leq E \leq 10,000$. S is the source vertex of the network, $0 \leq S < N$. D is the sink vertex of the network, $0 \leq D < N$. There is a further constraint that $S \neq D$.

The next E lines contain three integers – V_i , V_j , C – where V_i is the source vertex of the directed edge, V_j is the destination vertex of the directed edge and C is the capacity of the directed edge. $1 \leq C \leq 10,000$.

The Output

For each test case, output the message “Test x: Maximum flow = y”, where x is the test case number and y is the maximum flow capacity for the given network. Test case numbers start at 1.

Sample Input

```
1
7 8 0 6
0 1 3
0 2 1
1 3 3
2 3 5
2 4 4
3 6 2
4 5 2
5 6 3
```

Sample Output

```
Test 1: Maximum flow = 3
```