Maximum Flow: Simplified Version

Time Limit: 2 seconds

Problem Description

A flow network is a directed graph $G = (V, E)$ where each edge $e \in E$ has a capacity $c(e) > 0$. A flow f from source s to sink t is a function $E \to \mathbb{R}^+ \cup \{0\}$ such that:

- $f(e) \leq c(e)$ for $e \in E$.
- $f(e) = 0$ for $e \notin E$.
- $\sum_{u \in V} f(u, v) = \sum_{u' \in V} f(v, u')$ for $v \in V \backslash \{s, t\}$.

Given a flow network, write a program to compute the maximum flow f^* from s to t, i.e., $|f^*| = \sum_{v \in V} f^*(s, v)$ is maximized. You may assume there is only one edge between any pair of distinct vertices.

Technical Specifications

1. The number of test cases is no more than 20.
2. Basic: $n \leq 20$, $m \leq 50$.
3. Hard: $n \leq 50$, $m \leq 200$.
4. For $(u, v) \in E$, $1 \leq c(u, v) \leq 10^6$, and c_i's are integral.

Input Format

The first line of the input file contains an integer indicating the number of test cases. The first line of each test case contains 4 integers n, m, s, t where $V = \{0, \ldots, n-1\}$, $|E| = m$, s is the source and t is the sink. The i-th of the following m lines contains three integers u_i, v_i, c_i representing that the i-th edge is from u_i to v_i and $c(u_i, v_i) = c_i$.

Output Format

For each test case, output $|f^*|$.

Sample Input

```
2
4 5 0 3
0 1 100000
0 2 100000
1 2 1
1 3 100000
2 3 100000
6 9 0 5
0 1 16
0 2 13
2 1 4
1 3 12
3 2 9
2 4 14
4 3 7
3 5 20
4 5 4
```

Sample Output

```
200000
23
```