E. Expected Crossover

Rami and *Yessine* were planning to meet at the city of *Sfax*. Unfortunately, they both forgot their phones, so they lost contact of each other. So,each one of them will follow a **random** direction **at the same time and independently from each other** until meeting at the same location.

Sfax is a directed graph with n nodes $0, \dots, n-1$ and m edges. An edge $i \rightarrow j$ represents a potential direction that a person can follow if he is currently at the node i. Also, that edge $i \rightarrow j$ has a probability $p_{i,j}$ of being selected, which does not depend on the person.

Furthermore, the edge $i \rightarrow i$ represents that a person will stay on the edge i. If a person is on the node i; he has a probability $p_{i,i}$ that he will stay on that node.

Rami starts at the node s and *Yessine* starts at node t.

What is the expected length of the walk both persons will follow until meeting each other.

Note that the length of a walk is the number of followed edges.

Input

- A line containing 4 integers n, m, s, t :
  - n : the number of nodes
  - m : the number of edges
  - s : starting node of *Rami*
  - t starting node of *Yessine*
- The next m lines contains each 3 integers u_i, v_i, p_{u_i,v_i}. with:
  - $u_i \rightarrow v_i$: denotes an edge of the graph
  - p_{u_i,v_i} : is the probability of selecting this edge if the person is at node u_i

Output

The expected length of the walk of *Rami* and *Yessine* until they meet each other.

If the expected length is infinity; output `inf`

Constraints

- $1 \leq n \leq 25$
- $1 \leq m \leq n^2$
- $0 \leq s, q \leq n-1$
- $0 \leq u_i, v_i \leq n-1$
- $0 \leq p_{u_i,v_i} \leq 1$

It is guaranteed that:

$$\forall i \in \{0, \ldots, n-1\}, \quad \sum_{j=0}^{n-1} p_{i,j} = 1$$

It is also guaranteed that:

$$\forall i, j \in \{0, \ldots, n-1\}, \quad p_{i,j} = 0 \text{ or } p_{i,j} \geq 0.04$$

Sample

3 6 0 2 **0 1 0.5** **0 2 0.5** **1 2 0.5** **1 0 0.5** **2 1 0.5** **2 0 0.5**	**4**
5 5 0 4 0 1 1 1 2 1 4 3 1 3 2 1 2 2 1	2
3 4 0 2 0 1 0.5 0 2 0.5 2 2 1 1 1 1	inf