Name finding

Japanese names usually consist of two or three kanji, which are complicated characters from Chinese. There are very many kanji in use (over 2000!), which is why it's quite rare to see the kanji of ones name. It's even more rare to see all of them at the same time.

Mouse Stofl is a bit disappointed that he doesn't have a Japanese name. He would also like to rejoice when seeing the characters of his name in daily life, but of course that's really common. Instead, he restricts himself to the first letter of the name of the road he's on. He now wants to find out whether he can take a path through the city such that he sees the letters of his names (in that order) as the first letters on the roads he takes. Because he wants to achieve maximum enjoyment, he only wants to travel on such roads, so he wants to take a path that precisely spells out his name.

He has to get from Zurich main station to the location where the first final round takes place.

Input

The first line contain four numbers: n, the number of intersections in the city, m, the number of roads in the city, as well as a and b, the indices of the train station and the contest location in the graph.

The next line contains a string s of length l consisting of characters from a to z, the name that should be formed along the path.

m lines follow, each containing two numbers and a character, a_i and b_i, the intersections connected by this road, as well as $s_i \in \{a, b, \ldots, z\}$, the initial character of the road name.

Output

Output either "POSSIBLE" or "IMPOSSIBLE", indicating whether it's possible to take a path from a to b that spells out the given name.

Limits

There are four test groups worth different amount of points.

In all test groups, we have $1 \leq n \leq m \leq n^2$.

- In Test group 1 (worth 20 points): $n \leq 10$, $l \leq 26$ and the same character doesn't appear twice in the name
- In Test group 2 (worth 30 points): $n \leq 100$, $l \leq 100$
- In Test group 3 (worth 20 points): $n \leq 1000$, $l \leq 1000$, and there are no two roads starting with the same initial character at the same intersection.
- In Test group 4 (worth 30 points): $n \leq 1000$, $l \leq 1000$

Examples

Input	Output
6 6 0 4 acbzzqqq 0 1 a 0 2 b 2 1 c 0 5 d 0 3 z 0 4 q	POSSIBLE

The path 0-1-2-0-3-0-4-0-4 yields the desired sequence.

Input	Output
3 3 1 0 zaba 0 1 z 0 2 a 2 0 b	IMPOSSIBLE