D - The Simple Game

Editorial (/contests/abc427/tasks/abc427_d/editorial)

Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 425 points

Problem Statement

There is a directed graph with N vertices and M edges. The vertices are numbered from 1 to N, and the i-th edge is a directed edge from vertex U_i to vertex V_i. Here, the out-degree of each vertex is at least 1.

Also, each vertex has a character written on it, and the character written on vertex i is S_i. Here, S_i refers to the i-th character of S.

Alice and Bob play the following game on this graph using one piece:

- Initially, the piece is placed on vertex 1, and they alternately perform the following operation K times each, with Alice going first and Bob going second.
  - Let u be the vertex where the piece is currently placed. Choose a vertex v such that there is an edge from vertex u to vertex v, and move the piece to vertex v.
- Let v be the vertex where the piece is finally placed. If $S_v =$ A, Alice wins; if $S_v =$ B, Bob wins.

Find the winner of the game when both players play optimally.

In each input, you are given T test cases. Solve each of them.

Constraints

- $1 \leq T$
- $2 \leq N, M \leq 2 \times 10^5$
- $1 \leq K \leq 10$
- S is a string of length N consisting of A and B.
- $1 \leq U_i, V_i \leq N$
- $(U_i, V_i) \neq (U_j, V_j)$ if $i \neq j$.
- The out-degree of each vertex is at least 1.
- The sum of N over all test cases in a single input is at most 2×10^5.
- The sum of M over all test cases in a single input is at most 2×10^5.

Input

The input is given from Standard Input in the following format:

$$
\begin{aligned}
&T \\
&\mathrm{case}_1 \\
&\mathrm{case}_2 \\
&\dots \\
&\mathrm{case}_T
\end{aligned}
$$

Here, case_i represents the i-th test case, and each test case is given in the following format:

$$
\begin{aligned}
&N \quad M \quad K \\
&S \\
&U_1 \quad V_1 \\
&U_2 \quad V_2 \\
&\vdots \\
&U_M \quad V_M
\end{aligned}
$$

Output

Print T lines. The i-th line should contain `Alice` if Alice wins when both players play optimally in the i-th test case, and `Bob` if Bob wins.

Sample Input 1 Copy

Copy

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```
3
4 6 2
AABB
1 2
2 3
3 1
3 3
3 4
4 2
4 6 2
ABAB
1 2
2 3
3 1
3 3
3 4
4 2
5 8 3
ABABB
1 2
2 2
2 3
3 1
3 4
4 4
4 5
5 3
```

Sample Output 1 Copy

Copy

```
Alice
Bob
Bob
```

We will explain an example of how the game proceeds in the first test case. Here, both players do not necessarily play optimally.

- Initially, the piece is placed on vertex 1.
- Alice moves the piece to vertex 2.
- Bob moves the piece to vertex 3.
- Alice moves the piece to vertex 3.
- Bob moves the piece to vertex 1.

At this point, $S_1 =$ A, so Alice wins.

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