Problem

Graph Game

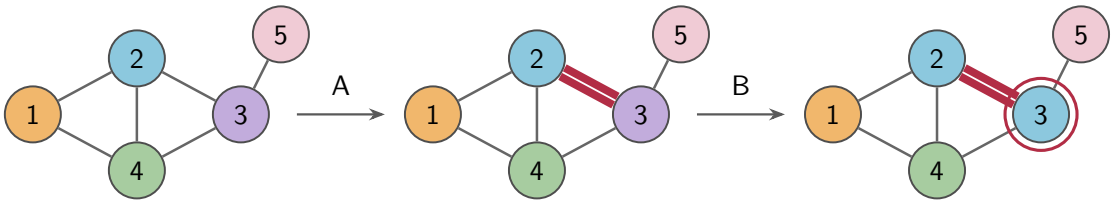
Time limit: 3 seconds

This is an interactive problem.

Little Cyan Fish has a simple undirected graph with n vertices labeled from 1 to n and m edges labeled from 1 to m. Initially, the color of vertex i is i.

Two players, A and B, play a game consisting of m rounds. In each round, the players take the following actions in order:

- Player A chooses an edge (u, v) that has not been chosen in any previous round.
- Player B chooses one endpoint of this edge and changes its color to the current color of the other endpoint.



After all m rounds, Player B wins if all vertices have the same color. Otherwise, Player A wins.

Little Cyan Fish wants you to determine which player can guarantee a win regardless of the other player's moves. Then play as that player against him and win the game.

Input

There are multiple test cases. The first line of the input contains a single integer T ($1 \le T \le 10^4$), indicating the number of test cases.

For each test case, the first line contains two integers n and m ($2 \le n \le 10^5$, $1 \le m \le 10^5$), indicating the number of vertices and the number of edges, respectively.

The next m lines describe the edges. The i-th of these lines contains two integers u_i and v_i ($1 \le u_i, v_i \le n$, $u_i \ne v_i$), meaning that edge i connects vertices u_i and v_i.

It is guaranteed that the graph has no self-loops or multiple edges. The graph may be disconnected.

It is guaranteed that the sum of n over all test cases does not exceed 10^5, and the sum of m over all test cases does not exceed 10^5.

After reading a graph, complete the interaction for that test case before reading the next graph.

Interaction Protocol

To choose your role, output a line containing `A` or `B`. Output `A` if Player A can guarantee a win, or `B` if Player B can guarantee a win. Little Cyan Fish will play as the other player.

Then play exactly m rounds as follows.

- If you play as A, output a line containing a single integer e ($1 \le e \le m$), the index of an edge that has not been chosen in any previous round. As a response, you will get a single integer x on a line. Vertex x is an endpoint of edge e, and its color changes to the current color of the other endpoint.

- If you play as B, read a single integer e ($1 \leq e \leq m$) on a line, the index of an edge that has not been chosen in any previous round. Output a line containing a single integer x, an endpoint of edge e. The color of vertex x changes to the current color of the other endpoint.

After all m rounds, read a single integer. This integer is `1` if you chose the correct role and won the game. After receiving `1`, continue with the next test case. After the last test case, your program should terminate.

The interactor will send `-1` if you choose an incorrect role, make an invalid move, or lose a game. If you receive `-1` at any point, your program should terminate immediately.

After outputting your role or a move, do not forget to output a newline character and flush the output stream.

Testing Tool: A testing tool is provided to help contestants develop and test their solutions. You can download this tool from the attachments. Run the tool with the `-h` option to display usage instructions. The testing tool covers only some of the test scenarios and features supported by the official interactor.

Sample Interaction 1

Read	Write
2	
3 2	
2 3	
1 2	
	B
1	
	3
2	
	1
1	
4 3	
1 2	
2 3	
3 4	
	A
	1
2	
	3
4	
	2
3	
1	

The two games in the sample are shown below. In each step, A selects the highlighted edge and B recolors the circled vertex. Dashed edges were chosen earlier.

