Task Magenta

Paula and Marin are playing a game on a tree. Not on a real tree, of course. That would be **dangerous**. Although, who can say that a connected graph with n nodes, marked by integers from 1 to n, and $n - 1$ edges, is completely safe?

Before the game started, Paula colored some edges blue, and Marin colored some edges red. If some edge was colored by both, its final color is magenta. All edges were colored by at least one of them.

Paula's piece starts the game in node a, and Marin's piece in node b. Players alternate moves, and Paula goes first. When it's their turn, the player must move their piece to some adjacent node which doesn't also contain the opponents piece. Also, Paula can't use red edges, and Marin can't use blue edges, while both can use magenta edges. The player who can't make a move loses.

Paula and Marin both play optimally. If they realize that the game can run forever, they will declare a draw. Determine the outcome of the game!

Input

The first line contains an integer n ($2 \leq n \leq 100\ 000$), the number of nodes.

The second line contains integers a and b ($1 \leq a, b \leq n$, $a \neq b$), initial nodes of Paula and Marin.

The next $n - 1$ lines describe the edges. Each line is of the form "x y $color$", where x and y ($1 \leq x, y \leq n$) are the endpoints, and $color$ is `plava` (Croatian for *blue*), `crvena` (Croatian for *red*) or `magenta`.

Output

Output `Paula` if Paula will win, `Marin` if Marin will win, or `Magenta` if it's a draw.

Scoring

Subtask	Points	Constraints
1	30	$2 \leq n \leq 100$
2	30	All colors are `magenta`.
3	50	No additional constraints.

Examples

input	input	input
3 1 3 3 2 magenta 2 1 magenta	5 3 5 1 2 magenta 1 3 magenta 2 4 plava 2 5 crvena	5 1 4 2 1 plava 1 3 crvena 5 2 plava 4 1 magenta
output	**output**	**output**
Paula	Marin	Magenta

Clarification of the first example:

Paula will move to node 2, and then Marin can't make a move.

Clarification of the second example:

Paula must move to node 1, and then Marin will move to node 2. Paula now can't move to node 2, since Marin is there, so she must return to node 3. Marin moves to node 1 and wins.