Collapse

There are N towns along a deep linear valley in JOI Country. Towns are numbered $0, 1, \ldots, N-1$ in order of distance from the sea.

Mr. I, the chair of JOI Country Scientific Committee, is going to maintain bidirectional communication cables between the towns. Currently there are no cables in JOI Country.

Mr. I has a cable construction plan for C days. The plan on the $(i+1)$-th day $(0 \leq i \leq C-1)$ is represented by three integers T_i, X_i, Y_i, which mean:

- If $T_i = 0$, they construct a cable connecting town X_i and town Y_i (it is assured that there does not exist a cable connecting town X_i and town Y_i at the beginning of the $(i+1)$-th day).
- If $T_i = 1$, they remove a cable connecting town X_i and town Y_i (it is assured that there exists a cable connecting town X_i and town Y_i at the beginning of the $(i+1)$-th day).

Cliff collapse often happens in JOI Country. If collapse happens between town x and town $x+1$ $(0 \leq x \leq N-2)$, any cable which connects a town numbered at most x and a town numbered at least $x+1$ becomes unavailable. In JOI Country, when collapse happens, they choose some towns to install base stations. Base stations should be installed in such a way that, from any town, it is possible to reach a base station by following available cables.

Mr. I is concerned with the number of towns to install base stations when collapse happens during the construction period. He has Q questions: the $(j+1)$-th question is represented by two integers W_j, P_j, which mean that he wants to know the minimum number of base stations which should be installed if collapse happens between town P_j and town P_j+1 at the end of the (W_j+1)-th day.

You, as an assistant of Mr. I, are in charge of writing a program to answer Mr. I's questions.

Example

Consider the case where there are 5 towns. In the following, (x, y) denotes a cable connecting town x and town y.

- Assume that when there are 4 cables $(0, 1)$, $(1, 3)$, $(2, 4)$ and $(4, 0)$, collapse happens between town 1 and town 2. Cables $(1, 3)$ and $(4, 0)$ become unavailable, so the available cables are $(0, 1)$ and $(2, 4)$. You can install base stations at towns 0, 2 and 3. The minimum number of base stations needed is 3.
- Assume that when there are 6 cables $(0, 1)$, $(0, 3)$, $(1, 2)$, $(2, 4)$, $(4, 0)$ and $(4, 3)$, collapse happens between town 3 and town 4. Cables $(2, 4)$, $(4, 0)$ and $(4, 3)$ become unavailable, so the available cables are $(0, 1)$, $(0, 3)$ and $(1, 2)$. You can install base stations at towns 0 and 4. The minimum number of base stations needed is 2.

Subtasks

There are 4 subtasks. The score and the constraints for each subtask are as follows:

Subtask	Score	N	C, Q	Additional constraints
1	5	$2 \le N \le 5\,000$	$1 \le C, Q \le 5\,000$	(none)
2	30	$2 \le N \le 100\,000$	$1 \le C, Q \le 100\,000$	All P_j $(0 \le j \le Q-1)$ are equal.
3	30	$2 \le N \le 100\,000$	$1 \le C, Q \le 100\,000$	$T_i = 0$ $(0 \le i \le C-1)$.
4	35	$2 \le N \le 100\,000$	$1 \le C, Q \le 100\,000$	(none)

Implementation details

You should implement the following function `simulateCollapse` to answer Q questions.

- `simulateCollapse(N, T, X, Y, W, P)`
  - `N`: number of towns in JOI Country.
  - `T`, `X`, `Y`: arrays of length C. For $0 \le i \le C-1$, T_i, X_i and Y_i represent the construction plan on the $(i+1)$-th day (T_i is either 0 or 1, $0 \le X_i \le N-1$, $0 \le Y_i \le N-1$, $X_i \ne Y_i$).
  - `W`, `P`: arrays of length Q. For $0 \le j \le Q-1$, W_j and P_j represent $(j+1)$-th question ($0 \le W_j \le C-1$, $0 \le P_j \le N-2$).
  - This function should return an array D of integers of length Q. For $0 \le j \le Q-1$, D_j should be the answer to the $(j+1)$-th question.

Sample grader

The sample grader reads the input in the following format:

- line 1: N C Q
- line $2+i$ $(0 \le i \le C-1)$: T_i X_i Y_i
- line $2+C+j$ $(0 \le j \le Q-1)$: W_j P_j

The sample grader prints the return value of `simulateCollapse` in the following format:

- line $1+j$ $(0 \le j \le Q-1)$: D_j