Question

A and B want to break into a top-secret research laboratory. Unfortunately, the entrance is equipped with an elaborate security system: The system asks a question (which is "for simplicity" encoded as an integer q ($1 \leq q \leq N$)) that must be answered with either "yes" or "no". If the answer is correct, the system opens the door; otherwise the alarm goes off. Both A and B know that the system's question q is always equal to either x or y ($x \neq y$), where the correct answer to x is "yes" and the correct answer to y is "no".

When A and B are planning the details of their coup, they cannot remember the values x and y, however. Therefore, B is sent to the entrance to just try, while A is positioned in some distance to guarantee their escape.

But suddenly, just as the question appears, A remembers both x and y and the correct answers. But from the distance A cannot give explicit instructions to B. He can only shout one integer h ($1 \leq h$) over to B. Therefore, A tries to encode in h all information that B needs to correctly answer the question.

Please help A and B in this situation and write a program that can play the part of both A and B. Your program should,

1) for given values N, x, y, help A and tell him which number h to shout over to B; and
2) for given values N, q, h, help B and tell him what answer to choose.

Your program will be tested as follows: At first, it will be told to help A and generate numbers h for several test cases; then, it will be told to help B and given as test cases the numbers h it generated before. That is, your submission will be run exactly twice per testcase.

Input

The first input line contains a single integer, either 1 (in the first run) or 2 (in the second run).

If it is 1, then the program has to help A. The rest of the input mainly consists of T test cases: The second line contains the integers N and T (N is the same for all test cases in one input). The i-th of the following T lines describes test case i and contains two integers x and y ($1 \leq x, y \leq N$, $x \neq y$).

If it is 2, then the program has to help B. The rest of the input mainly consists of T test cases: The second line contains the integers N and T (N is the same for all test cases in one input). The i-th of the following T lines contains two integers q and h ($1 \leq q \leq N$, $1 \leq h$); h is the number that the program has output for test case i in the first run.

Output

If the program has to help A, the output shall consist of T lines, where the ith line contains the integer h ($1 \leq h$) that A should shout over to B for test case i. For any two test cases with the same input values x and y, your program must output the same value h.

If the program has to help B, the output shall consist of T lines, where the ith line contains either the string `yes` or the string `no`: i.e., the correct answer to the question for test case i. For any two test cases with the same input values q and h, your program must output the same answer string.

Testing

For testing, you can use the supplied `manager.sh` utility:

Create an "input file" (e.g., `input.txt`): The first line must contain the numbers N and T. Each of the following T lines consist of the numbers x, y and q for the corresponding test case.

Then (after compiling as usually), you can run your solution using the command

```
./manager.sh ./yoursolution input.txt
```

This will create files `for1.txt` and `from1.txt` (the input and output files for your program helping A) and `for2.txt` and `from2.txt` (the input and output files for your program helping B). Moreover, it will tell you whether your solution correctly solved the input you specified.

Constraints

In all test cases $1 \leq N \leq 920$ and $1 \leq T \leq 2\,000\,000$.

Scoring

Your score depends on the largest number h that A shouts over to B, over all test input files:

Largest h	Points
≥ 21	0 (reported as incorrect output)
20	27
19	30
18	33
17	37
16	42
15	50
14	60
13	75
≤ 12	100

Also, all your program's outputs in the second runs for all input files must be correct; otherwise, your program will score 0 points.

Sample

input.txt	for1.txt	from1.txt	for2.txt	from2.txt
5 6 1 2 1 4 5 4 1 2 2 3 5 3 4 5 5 5 2 2	1 5 6 1 2 4 5 1 2 3 5 4 5 5 2	12 2 12 4 2 1	2 5 6 1 12 4 2 2 12 3 4 5 2 2 1	yes yes no yes no no

Note that many other outputs `from1.txt` would be valid but only this output `from2.txt` is correct.

Limits

Time limit: 7 s
Memory limit: 256 MB

Note that the used time and memory reported by the contest system is the maximum of the used time and memory of both runs of your submission.

Feedback

There is full feedback given for this task, i.e. the public score shown equals your real score and you are shown the verdicts for all the testcases.