B. Number game

Description

Lanran has an interesting number game. First, given an integer $m(0 \leq m \leq 10^9)$, Lanran should choose an initial non-negative number x which is less than or equal to m. Then he will do n given bitwise operations to this number, which includes AND, OR, and XOR and get a final number y. Now he wants to know what is the maximum value of y he can get. Note that, y can be larger than x.

Input format

The first line contains 2 integers $n, m(1 \leq n \leq 10^5, 0 \leq m \leq 10^9)$.

The next n lines contains one operation(only includes AND, OR, XOR) and one non-negative integer $t(0 \leq t \leq 10^9)$.

Output format

Output one integer, indicating the maximum final number Lanran can get.

Samples

Sample input

```
3 10
AND 5
OR 6
XOR 7
```

Sample output

```
1
```

Limitations & Hints

Limit

1 second for each test case. The memory limit is 256MB.

For 60% of the test cases, $n \leq 100, 0 \leq m, t \leq 10^5$.

For 100% of the test cases, $n \leq 10^5, 0 \leq m, t \leq 10^9$.

Hint

If Lanran choose initial number $x = 4$,

4 AND 5 = 4

4 OR 6 = 6

6 XOR 7 = 1

and he will get $y = 1$.