Changing Bits

Let A and B be two N bit numbers (MSB to the left). You are given initial values for A and B, and you have to write a program which processes three kinds of queries:

- set_a idx x: Set A[idx] to x, where 0 <= idx < N, where A[idx] is idx'th least significant bit of A.
- set_b idx x: Set B[idx] to x, where 0 <= idx < N, where B[idx] is idx'th least significant bit of B.
- get_c idx: Print C[idx], where C=A+B, and 0<=idx

Input Format

First line of input contains two integers N and Q consecutively (1 <= N <= 100000, 1<= Q <= 500000). Second line is an N-bit binary number which denotes initial value of A, and the third line is an N-bit binary number denoting initial value of B. Q lines follow, each containing a query as described above.

Output Format

For each query of the type get_c, output a single digit 0 or 1. Output must be placed in a single line.

Sample Input 0

```
5 5
00000
11111
set_a 0 1
get_c 5
get_c 1
set_b 2 0
get_c 5
```

Sample Output 0

```
100
```

Explanation 0

- set_a 0 1 sets 00000 to 00001
- C = A + B = 00001 + 11111 = 100000, so get_c[5] = 1
- from the above computation get_c[1] = 0
- set_b 2 0 sets 11111 to 11011
- C = A + B = 00001 + 11011 = 011100, so get_c[5] = 0

The output is hence concatenation of 1, 0 and 0 = 100