

## 1080 – Binary Simulation

Given a binary number, we are about to do some operations on the number. Two types of operations can be here.

**'I i j'** which means invert the bit from **i** to **j** (inclusive)

**'Q i'** answer whether the **i<sup>th</sup>** bit is 0 or 1

The MSB (most significant bit) is the first bit (**i.e. i=1**). The binary number can contain leading zeroes.

### Input

Input starts with an integer **T** ( $\leq 10$ ), denoting the number of test cases.

Each case starts with a line containing a binary integer having length **n** ( $1 \leq n \leq 10^5$ ). The next line will contain an integer **q** ( $1 \leq q \leq 50000$ ) denoting the number of queries. Each query will be either in the form **'I i j'** where **i, j** are integers and  $1 \leq i \leq j \leq n$ . Or the query will be in the form **'Q i'** where **i** is an integer and  $1 \leq i \leq n$ .

### Output

For each case, print the case number in a single line. Then for each query **'Q i'** you have to print 1 or 0 depending on the **i<sup>th</sup>** bit.

| Sample Input  | Output for Sample Input                                      |
|---|--|
| 2<br>0011001100<br>6<br>I 1 10<br>I 2 7<br>Q 2<br>Q 1<br>Q 7<br>Q 5<br>1011110111<br>6<br>I 1 10<br>I 2 7<br>Q 2<br>Q 1<br>Q 7<br>Q 5 | Case 1 :<br>0<br>1<br>1<br>0<br>Case 2 :<br>0<br>0<br>0<br>1 |

### Note

Dataset is huge, use faster i/o methods.