Clements Computer Science Competition
November 2015
Hands-On Programming Set
Advanced

I. General Notes

1. Do the problems in any order. They do not have to be done in order from 1 to 12.

2. All problems have a value of 60 points.

3. There is no extraneous input. All input is exactly as specified in the problem. Unless specified by the problem, integer inputs will not have leading zeros. Unless otherwise specified, your program should read to the end of file.

4. Your program should not print extraneous output. Follow the form exactly as given in the problem.

5. A penalty of 5 points will be assessed each time that an incorrect solution is submitted. This penalty will only be assessed if a solution is ultimately judged as correct.

II. Point Values and Names of Problems

Number	Name
Problem 1	Wake Up!
Problem 2	Customer Scheduling
Problem 3	Joe's Agenda
Problem 4	Shopping List
Problem 5	Voltage and Power
Problem 6	Flipping Lights
Problem 7	Gates
Problem 8	Electricity Flow
Problem 9	Fixing Appliances
Problem 10	Pay in Cash
Problem 11	The Way Back Home
Problem 12	Key Probability

6. Flipping Lights

Program Name: Lights.java **Input File: lights.dat**

Joe is working a job where he has to test a lot of light switches. Given an initial position of a row of light bulbs and instructions on how to flip the switches, help show Joe how the row should look after he's done.

Input

The first line will contain a single integer `n` that indicates the number of data sets that follow. Each data set will start with a string representing the row of light bulbs, 1 being on and 0 off, and a single integer `m` representing the number of actions to be performed on the row of lights. There are 6 possible actions:

- `FLIP A B` – flips all of the lights to their inverse from `A` inclusive to `B` exclusive
- `FLIP ALL` – flips all of the lights to their inverse
- `ON A B` – turns on all lights from `A` inclusive to `B` exclusive
- `ON ALL` – turns on all lights
- `OFF A B` – turns off all lights from `A` inclusive to `B` exclusive
- `OFF ALL` – turns off all lights

Any range `A` to `B` is 0-indexed.

Output

Output what the string of lights should look like after all of the actions have been performed.

Example Input File

```
2
1010101010 4
FLIP ALL
ON 0 2
ON 8 10
OFF 4 6
000000 2
ON 0 3
FLIP ALL
```

Example Output to Screen

```
1101000111
000111
```