Practice Exercise #21: Turning Knobs

http://www.comp.nus.edu.sg/~cs1020/4_misc/practice.html

Objectives:

- Using **ArrayList** class.
- Designing your own class.

Task Statement

A four-way knob has 4 positions: "up", "right", "down" and "left. The knob can only turn in the clockwise direction. For example, if the current position is "right", it takes 3 stops to reach position "up".

Moreover, the knob is used to control a device and the latter has two states: "on" or "off". For every stop we take to turn the knob, the device would toggle its state. For example, if the knob's original position is "right" and its attached device's state is "on", then turning the knob to "down" position would turn off the device, and turning the knob to "left" position would turn on the device again.

You are to write a program that reads in information about some knobs. Each knob has its device's state, its current position and its target position. You are to find out for each knob the final state of its device, and the total number of stops you need to make to turn all the knobs to their target positions.

If the current position and target position of a knob are identical, you must turn the knob one complete round, that is, 4 stops. You should never turn a knob more than one complete round.

Input

The first line of the input contains a positive integer **N** ($1 \leq \mathbf{N} \leq 10$) which indicates the number of knobs. In the subsequent **N** lines, each line contains information about a knob. If the line begins with the word "on" it means that the initial state of the attached device is on; if the word "on" is absent, it means the device is off. The rest of the line contains the current position and target position of the knob.

(The above symbol **N** is used to ease explanation. In your program, you should give more descriptive variable names and follow Java naming convention.)

Output

The output contains **N**+1 lines. The first **N** lines contain the final states of the respective devices, and the last line contains the total number of stops made to turn all the knobs.

Skeleton Programs

The skeleton programs **Knob.java** and **TurnKnobs.java** are given. The former is the service class, while the latter is the client class.

Note that you are to use **ArrayList** to store data about the knobs. This is the objective of this exercise.

Sample Input #1

```
2
on right up
up down
```

Sample Output #1

```
off
off
Total stop(s) = 5
```

Sample Input #2

```
3
down right
on left left
left right
```

Sample Output #2

```
on
on
off
Total stop(s) = 9
```