Google Code Jam '10 Qualification Round Problem B - Snapper Chain

Time limit: 30.0s **Memory limit:** 1G

The *Snapper* is a clever little device that, on one side, plugs its input plug into an output socket, and, on the other side, exposes an output socket for plugging in a light or other device.

When a *Snapper* is in the ON state and is receiving power from its input plug, then the device connected to its output socket is receiving power as well. When you snap your fingers -- making a clicking sound -- any *Snapper* receiving power at the time of the snap toggles between the ON and OFF states.

In hopes of destroying the universe by means of a singularity, I have purchased N *Snapper* devices and chained them together by plugging the first one into a power socket, the second one into the first one, and so on. The light is plugged into the Nth *Snapper*.

Initially, all the *Snapper*s are in the OFF state, so only the first one is receiving power from the socket, and the light is off. I snap my fingers once, which toggles the first *Snapper* into the ON state and gives power to the second one. I snap my fingers again, which toggles both *Snapper*s and then promptly cuts power off from the second one, leaving it in the ON state, but with no power. I snap my fingers the third time, which toggles the first *Snapper* again and gives power to the second one. Now both *Snapper*s are in the ON state, and if my light is plugged into the second *Snapper* it will be *on*.

I keep doing this for hours. Will the light be *on* or *off* after I have snapped my fingers K times? The light is *on* if and only if it's receiving power from the *Snapper* it's plugged into.

Input Specification

The first line of the input gives the number of test cases, T. T lines follow. Each one contains two integers, N and K.

Output Specification

For each test case, output one line containing `Case #x: y`, where x is the case number (starting from 1) and y is either "ON" or "OFF", indicating the state of the light bulb.

Limits

Time limit: 30 seconds per test set.

Memory limit: 1GB.

$1 \leq T \leq 10\,000$.

Small dataset

$1 \leq N \leq 10$;

$0 \leq K \leq 100$;

Large dataset

$1 \leq N \leq 30$;

$0 \leq K \leq 10^8$;

Sample Input

```
4
1 0
1 1
4 0
4 47
```

Sample Output

```
Case #1: OFF
Case #2: ON
Case #3: OFF
Case #4: ON
```