

# LIGHT SWITCHES

You are given a string of synchronized blinking lights with  $N$  bulbs. This string of lights is interesting in that instead of blinking on and off in unison, they follow a very specific pattern. Assume that at time  $t = 0$  all bulbs are off. At each subsequent (integral) time  $t$ , bulbs toggle from on to off or off to on depending on their current configuration. When a bulb will toggle on or off depends on its position from the beginning of the string. If its position is a multiple of time  $t$ , it will toggle. So at time  $t = 1$  all bulbs will toggle on (1, 2, 3, 4, etc.). At time  $t = 2$  only even numbered bulbs (2, 4, 6, 8, etc.) will toggle again. At time  $t = 3$  every third bulb (3, 6, 9, 12, etc.) toggles. This continues up to time  $t = N$ , at which point all bulbs are reset to off and the blinking pattern restarts at time  $t = N + 1$ . (Thus time  $t = N + 1$  is viewed as equivalent to time  $t = 1$ : all bulbs are toggled on.)

Quality Control is having a hard time verifying that the bulbs are turning on and off at the appropriate times. Your team has been asked to write a verification program that can be given the number of bulbs  $N$  on the strand, a particular time  $t$ , and bulb position  $b$ , then determines if that bulb is on or off at time  $t + \epsilon$ . In other words, if the bulb is on at time  $t + \epsilon$ , then the bulb either toggled on at time  $t$  or was already on at time  $t$ .

The following limits hold for  $n$ ,  $t$ , and  $b$ :

$$3 \leq N < 2^{54}$$

$$1 \leq t, b < 2^{54}$$

$$b \leq N$$

[The judge's largest test case involves 17-digit numbers that start 123, so they are indeed  $< 2^{54}$ .]

## Input

Input to your program will be multiple lines each containing the number of bulbs,  $N$ , the time since they were turned on,  $t$ , and the bulb number we are interested in,  $b$ , separated by spaces. Read until at end of file, there is no end of data indicator.

## Output

Indicate if the specified bulb is on or off at the end of the requested time. Follow this format exactly: "Case", a space, the case number, a colon and one space, and the answer which is either "On" or "Off". Do not print any trailing spaces.

## Examples

Nº	stdin	stdout
1	55 10 24	Case 1: Off
	55 68 24	Case 2: On
	20 70 5	Case 3: Off

