## 1336 - Sigma Function

Sigma function is an interesting function in Number Theory. It is denoted by the Greek letter Sigma  $(\sigma)$ . This function actually denotes the sum of all divisors of a number. For example  $\sigma(24) = 1+2+3+4+6+8+12+24=60$ . Sigma of small numbers is easy to find but for large numbers it is very difficult to find in a straight forward way. But mathematicians have discovered a formula to find sigma. If the prime power decomposition of an integer is

$$n = p_1^{e_1} * p_2^{e_2} * \cdots * p_k^{e_k}$$

Then we can write,

$$\sigma(n) = \frac{p_1^{e_1+1}-1}{p_1-1} * \frac{p_2^{e_2+1}-1}{p_2-1} * \cdots * \frac{p_k^{e_k+1}-1}{p_k-1}$$

For some n the value of  $\sigma(n)$  is odd and for others it is even. Given a value n, you will have to find how many integers from 1 to n have even value of  $\sigma$ .

## Input

Input starts with an integer T ( $\leq 100$ ), denoting the number of test cases.

Each case starts with a line containing an integer  $n (1 \le n \le 10^{12})$ .

## Output

For each case, print the case number and the result.

Sample Input	Output for Sample Input
	Case 1: 1
3	Case 2: 5
10	Case 3: 83
100	Case 4: 947
1000	