Problem F

Parity

Time limit: 1 second
Memory limit: 1024 megabytes

Problem Description

We define the parity of an integer n as the sum of the bits in binary representation computed modulo two. As an example, the number $21 = 10101_2$ has three 1s in its binary representation so it has parity 3(mod2), or 1.

In this problem you have to calculate the parity of an integer $1 \leq I \leq 2147483647$.

Input Format

Each line of the input has an integer I and the end of the input is indicated by a line where $I = 0$ that should not be processed.

Output Format

For each integer I in the inputt you should print a line 'The parity of B is P (mod 2).', where B is the binary representation of I.

Sample Input 1

```
1
2
10
21
0
```

Sample Output 1

```
The parity of 1 is 1 (mod 2).
The parity of 10 is 1 (mod 2).
The parity of 1010 is 2 (mod 2).
The parity of 10101 is 3 (mod 2).
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