

## 1059 - Numeric Parity

### 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  $21 = 10101$  has three 1s in its binary representation so it has parity  $3 \pmod{2}$ , or 1. In this problem you have to calculate the parity of an integer  $1 \leq I \leq 2147483647 (2^{31}-1)$ . Then, let start to work...

### Input specification

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 specification

For each integer **I** in the input you should print one line in the form "*The parity of B is P (mod 2).*" where **B** is the binary representation of **I**.

### Sample input

```
1
2
10
21
0
```

### Sample output

```
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).
```

### Hint(s)

Source

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Added by

ejaltuna

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