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 (mod 2), or 1. In this problem you have to calculate the parity of an integer **1 <= I <= 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	UCI Local Contest 2010
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Time limit (ms)	1000
Test limit (ms)	1000
Memory limit (kb)	131072
Output limit (mb)	64
Size limit (bytes)	100000
Enabled languages	C C# C++ Java Pascal Perl PHP Python Ruby Text