DWITE '07 R5 #3 - Parity bit

DWITE Online Computer Programming Contest, February 2008, Problem 3

A parity bit is a binary digit that is added to ensure that the number of bits with value of 1 in a given set of bits is always even or odd. Parity bits are used as a simple validation code, for example to test that all the data has arrived correctly in a transmission. For this question we'll be using **even parity bit** – that is, we want to add a bit (1 or 0) so that the total number of high bits (1) is *even*.

For example, consider integer 13. Binary representation of 13 is `1101`. Number of high bits in `1101` is 3, which is odd. To make it even, the parity bit must also be high, so 1.

The input will contain 5 lines, integers $0 \leq N \leq 128$.

The output will contain 5 lines – a single integer, 1 or 0, representing a bit that needs to be added to form an even parity.

Sample Input

```
0
1
2
3
4
```

Sample Output

```
0
1
1
0
1
```

 Problem Resource: DWITE