Sum vs XOR

Given an integer, n, find each x such that:

- $0 \leq x \leq n$
- $n + x = n \oplus x$

where $\oplus$ denotes the bitwise XOR operator. Then print an integer denoting the total number of x's satisfying the criteria above.

Input Format

A single integer, n.

Constraints

- $0 \leq n \leq 10^{15}$

Subtasks

- $0 \leq n \leq 100$ for 60% of the maximum score.

Output Format

Print the total number of integer x's satisfying both of the conditions specified above.

Sample Input 0

```
5
```

Sample Output 0

```
2
```

Explanation 0

For $n = 5$, the x values 0 and 2 satisfy the conditions:

- $5 + 0 = 5 \oplus 0 = 5$
- $5 + 2 = 5 \oplus 2 = 7$

Thus, we print 2 as our answer.

Sample Input 1

```
10
```

Sample Output 1

```
4
```

Explanation 1

For $n = 10$, the x values 0, 1, 4, and 5 satisfy the conditions:

- $10 + 0 = 10 \oplus 0 = 10$
- $10 + 1 = 10 \oplus 1 = 11$

- $10 + 4 = 10 \oplus 4 = 14$
- $10 + 5 = 10 \oplus 5 = 15$

Thus, we print 4 as our answer.