A. Integer Sequence Dividing

time limit per test
1 second
memory limit per test
256 megabytes
input
standard input
output
standard output

You are given an integer sequence $1,2,\ldots,n$. You have to divide it into two sets A and B in such a way that each element belongs to **exactly one** set and $|sum(A)-sum(B)|$ is minimum possible.

The value $|x|$ is the absolute value of x and $sum(S)$ is the sum of elements of the set S.

Input

The first line of the input contains one integer n ($1 \le n \le 2 \cdot 10^9$).

Output

Print one integer — the minimum possible value of $|sum(A)-sum(B)|$ if you divide the initial sequence $1,2,\ldots,n$ into two sets A and B.

Examples

input

Copy

```
3
```

output

Copy

```
0
```

input

Copy

```
5
```

output

Copy

```
1
```

input

Copy

```
6
```

output

Copy

```
1
```

Note

Some (not all) possible answers to examples:

In the first example you can divide the initial sequence into sets $A=\{1,2\}$ and $B=\{3\}$ so the answer is 0.

In the second example you can divide the initial sequence into sets $A=\{1,3,4\}$ and $B=\{2,5\}$ so the answer is 1.
In the third example you can divide the initial sequence into sets $A=\{1,4,5\}$ and $B=\{2,3,6\}$ so the answer is 1.