

## 12792 Shuffled Deck

A card pack has an even number  $2n$  of cards  $a_1, a_2, \dots, a_{2n}$ , all distinct ( $a_1 < a_2 < \dots < a_{2n}$ ). The pack is initially sorted, that is, the first card in the pack is  $a_1$ , the second is  $a_2$ , and so on, and the last card in the pack is  $a_{2n}$ .

A handler then performs a shuffling procedure repeatedly. The shuffling consists of two steps:

1. the pack is divided in the middle;
2. the cards in the two halves are then interleaved so that if the original sequence at the beginning of step 1 is  $x_1, x_2, \dots, x_{2n}$ , then at the end of step 2 the sequence of cards becomes  $x_{n+1}, x_1, x_{n+2}, x_2, \dots, x_{2n}, x_n$ .

Given the number of cards in the pack, write a program to determine how many times the shuffling procedure must be executed so that the pack becomes sorted again.

### Input

The input contains several test cases. A test case consists of one line, which contains an even integer  $P$  ( $2 \leq P \leq 2 \times 10^5$ ), where  $P$  is the number of cards in the pack (notice that the value  $P$  corresponds to the value  $2n$  in the description above).

### Output

For each test case in the input your program must produce a single line, containing a single integer, the minimum number of times the shuffling procedure must be executed so that the set becomes sorted again.

### Sample Input

```
4
6
2
100002
```

### Sample Output

```
4
3
2
100002
```