Mathematicians are a curious breed of people. Especially number theorists. They spend most of their time thinking about different properties of numbers. Albert Meyer, a number theorist, is trying to discover an interesting sequence of positive integers. He suspects the sequence $i_1, i_2, i_3, \ldots$ in which the value of i_n is the number of numbers m, $1 \leq m \leq n$, where $gcd(m, n) \neq 1$ and $gcd(m, n) \neq m$, is very interesting. *gcd* is short for "greatest common divisor". He has turned to you, as you are an expert programmer and the calculations by hand are very tedious, to calculate a few numbers in this sequence.

Input

The input will consist of several positive integers $0 \leq n \leq 2^{31}$. The input will be terminated by EOF.

Output

For each number output the number of numbers m, $1 \leq m \leq n$, where $\gcd(m, n) \neq 1$ and $\gcd(m, n) \neq m$.

Sample Input

```
1
2
6
2147000000
```

Sample Output

```
0
0
1
1340599805
```