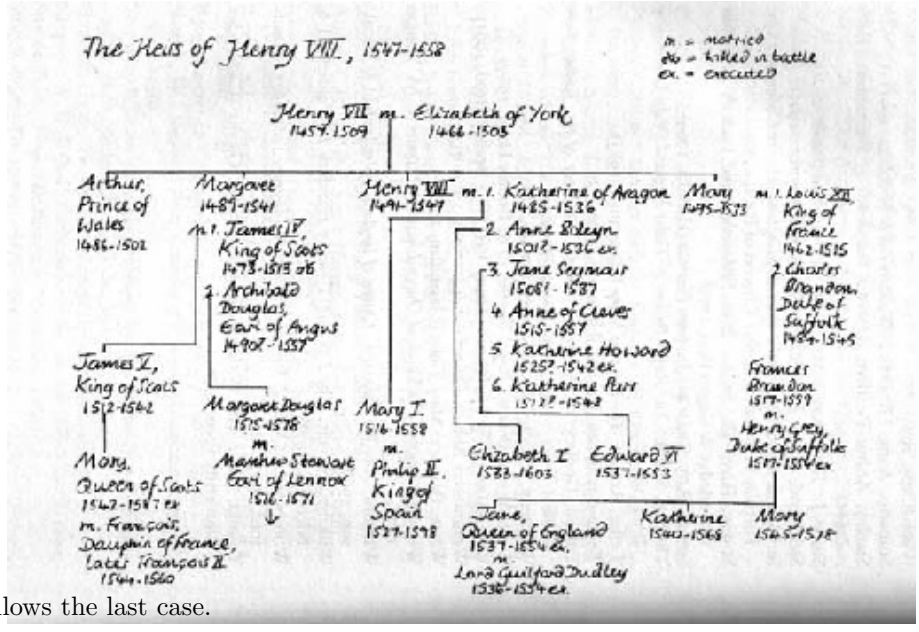
Given n, a positive integer, how many positive integers less than n are relatively prime to n? Two integers a and b are relatively prime if there are no integers $x > 1$, $y > 0$, $z > 0$ such that $a = xy$ and $b = xz$.



Input

There are several test cases. For each test case, standard input contains a line with $n \leq 1,000,000,000$. A line containing '0' follows the last case.

Output

For each test case there should be single line of output answering the question posed above.

Sample Input

```
7
12
0
```

Sample Output

```
6
4
```