

My Document

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Given an array a_1, a_2, \dots, a_n such that $a_i = i$ for all i . For an integer $k \geq 2$, the operation $Swap(k)$ is defined as:

Let d be the largest divisor of k which is not equal to k . Swap the elements a_d and a_k .

Suppose you perform $Swap(i)$ for all $2 \leq i \leq n$ in order. Find the position of 1 in the resulting array. In other words, find such j that $a_j = 1$ after performing these operations.

Input

Each test case contains multiple test cases. The first line contains the number of test cases t ($1 \leq t \leq 10^4$). The description of the test cases follows.

The only line of each test case contains one integer n ($1 \leq n \leq 10^9$) — the length of the array a .

Output

For each test case, output the position of 1 in the resulting array.

Example

input

4

1

4

5

120240229

output

1

4

4

67108864

Note

In the first test case, the array is $[1]$ and there are no operations performed.

In the second test case, a changes as follows:

Initially, a is $[1, 2, 3, 4]$.

After performing $Swap(2)$, a changes to $[2, 1, 3, 4]$.

After performing $Swap(3)$, a changes to $[3, 1, 2, 4]$.

After performing $Swap(4)$, a changes to $[3, 4, 1, 2]$ (that is, the element 1 lies on index 4). Thus, the answer is 4.