

Euler Totient Function

[English](#)

[Vietnamese](#)

In number theory, the totient ϕ of a positive integer n is defined to be the number of positive integers less than or equal to n that are coprime to n .

Given an integer n ($1 \leq n \leq 10^6$). Compute the value of the totient ϕ .

Input

First line contains an integer T , the number of test cases. ($T \leq 20000$)

T following lines, each contains an integer n .

Output

T lines, one for the result of each test case.

Example

Input:

```
5
1
2
3
4
5
```

Output:

```
1
1
2
2
4
```