Totient function

In number theory **φ(n)** is defined to be the number of positive integers less than or equal to n that are coprime to n.

Input

The first line of the standard input contains one integer **t** (t<101) which is the number of test cases.

In each of the next **t** lines there is one integer **n** ($n<2*10^9$).

Output

For each test, print **φ(n).**

Example

Input:
3
1
6
100
Output:
1
2
40