

Project Euler #72: Counting fractions



This problem is a programming version of [Problem 72](#) from [projecteuler.net](#)

Consider the fraction, $\frac{n}{d}$, where n and d are positive integers. If $n < d$ and $GCD(n, d) = 1$, it is called a reduced proper fraction.

If we list the set of reduced proper fractions for $d \leq 8$ in ascending order of size, we get:

$$\frac{1}{8}, \frac{1}{7}, \frac{1}{6}, \frac{1}{5}, \frac{1}{4}, \frac{2}{7}, \frac{1}{3}, \frac{3}{8}, \frac{2}{5}, \frac{3}{7}, \frac{1}{2}, \frac{4}{7}, \frac{3}{5}, \frac{5}{8}, \frac{2}{3}, \frac{5}{7}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}, \frac{6}{7}, \frac{7}{8}$$

It can be seen that there are **21** elements in this set.

How many elements would be contained in the set of reduced proper fractions for $d \leq N$?

Input Format

First line contains T , number of test cases. T lines follow
Each line contains 1 integer N

Constraints

$$1 \leq T \leq 100000$$

$$2 \leq N \leq 10^6$$

Output Format

Print the result corresponding to each testcase on a new line.

Sample Input

```
2
8
5
```

Sample Output

```
21
9
```