

# Project Euler #72: Counting fractions

## Problem Statement

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:

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

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  $N$

## Output Format

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

## Constraints

$$1 \leq T \leq 100000$$

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

## Sample Input

```
2
8
5
```

## Sample Output

```
21
9
```