Problem E: Euclidean Algorithm

Time limit: 30s, memory limit: 8MB.

You sit an exam and keep wondering how to calculate the greatest common divisor. With utmost effort you manage to recall that $\texttt{gcd}(x, y)$ is the greatest integer $d \geqslant 1$ that divides both x and y. You vaguely remember something along these lines having appeared at one of the lectures. Alas, even if your mind has managed to register any shreds of information during the class, they are now long gone, displaced by the adventures of Gebyte the Witcher as well as the newest episodes of Peaky Byters.

You start with x and y on the blackboard... then you compute some results of subtraction of the previously written numbers...? You try to chase away an unpleasant thought that it is going to end up exactly like the median problem last year... Or was it just one of your nightmares?

Based on your foggy memories from the lecture you came up with the following algorithm. You start with numbers x and y written on the blackboard. In one step you can choose any two numbers a and b that are already written on the blackboard, and write down $c = 2a - b$, conditional upon $c > 0$. The result for the pair (x, y) is the lowest number that can be written on the blackboard after repeating the above procedure some number of times (maybe zero).

After checking a few test cases, your algorithm looked promising. For example, for a pair $(10, 14)$, one of the numbers that you can write down in the first step is 6 (because $2 \cdot 10 - 14 = 6$), while in the next step you can write 2 (because $2 \cdot 6 - 10 = 2$). On the other hand, one can prove that it is impossible to obtain 1, so the algorithm's answer is correct. Unfortunately, for $(10, 16)$ the lowest number you managed to get was 4, while the correct answer is 2. Something is amiss...

For a given n determine the number of pairs (x, y) $(1 \leqslant x < y \leqslant n)$ for which your algorithm returns the correct value of $\texttt{gcd}(x, y)$ [1].

Observe that this task has a low memory limit – 8MB.

Input

The first line of input contains the number of test cases z ($z \geqslant 1$). The descriptions of the test cases follow.

The first and only line of a test case contains one integer n ($n \geqslant 2$) with the meaning explained in the problem statement.

Test cases

Each input file will belong to one of the three groups:

- $z \leqslant 3000$, $n \leqslant 10^6$
- $z = 30$, $n \leqslant 10^9$
- $z = 3$, $n \leqslant 10^{11}$

Output

For each test case, output one integer representing the number of pairs that we are looking for.

[1] In particular, if $\texttt{gcd}(x, y) = x$, then we consider the algorithm to work correctly, because x is already written on the blackboard at the start.

Example

For an example input:	The correct output is:
3 2 5 14	1 9 62