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**36th Annual High School Programming Contest**

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##### April 12, 2024

###### Green Problem #3: Is this elementary math, cryptography, or computer security?

Background Information:

Computer security, sometimes called cybersecurity, deals with the protection of computer systems. Protecting systems from damage, theft, and information leaks is critical to organizations and individuals.

Cryptography, an area of mathematics, is used to help secure computer systems. Integer factorization, which children begin to learn in 3rd grade, is the basis for security schemes.

Recall from early grade school mathematics that the only factor of 1 is 1. Also, the factors of 12 are 1, 2, 3, 4, 6, and 12. So 12 has six factors.

When learning about factoring a large integer N, students frequently conjecture that any factor greater than half of N must be paired with a factor less than half of N. This can halve the amount of work for finding all factors of N. In fact, a more significant reduction in work is possible by realizing that any factor greater than the $\sqrt{N}$ can be paired with a factor less than the $\sqrt{N}$.

Write a program that computes the number of positive integer factors of N where N is a positive integer less than or equal to 1,000,000. Note that for this problem % can be used (in both Python and Java) to compute the remainder when doing division.

Example-1: If N = 38, then N % 5 = 3. Example-2: If N = 48, then N % 12 = 0.

###### Programming Problem:

Input:  Positive integer N ≤ 1,000,000

Output: The number of positive integer factors of N.

Example 1: Input: Example 2: Input: Example 3: Input:

 1 36 7666

 Output: Output: Output:

 1 9 4