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STUDENT REPORT

DETAILS

Name

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Roll Number

TEMPBTech-ECE035

EXPERIMENT

Title

SUM OF NUMBERS AT PRIME FACTORS

Description

Prime factors of a positive integer are the prime numbers that divide that integer exactly.

Given an array arr of n integers and a positive integer num.

Let's suppose prime factorization of num is: $p^a \times q^b \times r^c \times .... \times z^f$,where p,q,r...z are prime numbers.

Sum of numbers in array arr at indices of prime factors of number num is: a x arr[p] + b x arr[q] + c x arr[r] +..... + f x arr[z].

You are given an array arr of size n and a positive integer num. You are required to calculate the sum of numbers in arr as mentioned above, and print the same.

Note:

- If arr is empty, print -1.
- If prime factor of num not found as indices, print 0.

Input Format:

The input consists of three lines:

- The first line contains an integer, i.e. n.
- The second line contains an array arr of length of n.
- The third line contains an integer num

The input will be read from the STDIN by the candidates.

Output Format:

Print the sum that was mentioned in the problem statement.

Example:

Input:

6

11 21 32 45 1 23

6

Output:

77

Explanation:

$6=2^1 \times 3^1$

sum=1*arr[2]+1*arr[3]=1*32+1*45=77

Source Code:

```
def prime_factors(n):

    factors = {}

    # Check for number of 2s
    while n % 2 == 0:
        if 2 in factors:
            factors[2] += 1
        else:
            factors[2] = 1
        n //= 2

    # Check for odd factors from 3 to sqrt(n)
    for i in range(3, int(n**0.5) + 1, 2):
        while n % i == 0:
            if i in factors:
                factors[i] += 1
            else:
                factors[i] = 1
            n //= i

    # If n is a prime number greater than 2
    if n > 2:
        factors[n] = 1

    return factors

def calculate_sum(arr, num):
    if len(arr) == 0:
        return -1  # Handle empty array case

    factors = prime_factors(num)
    total_sum = 0

    for prime in factors.keys():
        if prime < len(arr):  # Ensure the index is valid
            total_sum += factors[prime] * arr[prime]

    return total_sum if total_sum > 0 else 0  # Return 0 if no valid indices

# Input reading
n = int(input().strip())  # Read the size of the array
arr = list(map(int, input().strip().split()))  # Read the array
num = int(input().strip())  # Read the number

# Calculate and print the result
result = calculate_sum(arr, num)
print(result)
```

RESULT

4 / 5 Test Cases Passed | 80 %