



# STUDENT REPORT

## DETAILS

Name

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Roll Number

KUB23CSE015

## 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:  $p^a \times q^b \times r^c \times \dots \times z^f$ , where p,q,r...z are prime numbers.

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

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:

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

$$\text{sum} = 1 * \text{arr}[2] + 1 * \text{arr}[3] = 1 * 32 + 1 * 45 = 77$$

**Source Code:**

```
def prime_factors(num):
    factors = {}
    d = 2
    while d * d <= num:
        while (num % d) == 0:
            if d in factors:
                factors[d] += 1
            else:
                factors[d] = 1
            num //= d
        d += 1
    if num > 1:
        factors[num] = 1
    return factors

def calculate_weighted_sum(arr, num):
    if len(arr) == 0:
        return -1

    factors = prime_factors(num)
    total_sum = 0
    valid_indices = False

    for prime, count in factors.items():
        if prime < len(arr):
            total_sum += count * arr[prime]
            valid_indices = True

    return total_sum if valid_indices else 0

# Read input
import sys
input = sys.stdin.read
data = input().splitlines()

n = int(data[0])
arr = list(map(int, data[1].split()))
num = int(data[2])

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

**RESULT**

4 / 5 Test Cases Passed | 80 %