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# STUDENT REPORT

## DETAILS

**Name**

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**Roll Number**

23D21A05H4

## 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: $p^a$ x $q^b$ x $r^c$ x .... x $z^f$ ,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=$2^1$ x $3^1$

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

**Source Code:**

```
def prime_factors(num):
    factors = {}
    for i in range(2,int(num**0.5)+1):
        while num % i == 0:
            factors[i] = factors.get(i,0) + 1
            num //= i
    if num > 1:
        factors[num] = 1
    return factors
def calculate_sum(n,arr,num):
    if not arr:
        return -1
    factors = prime_factors(num)
    total_sum = 0
    for prime,power in factors.items():
        if prime < n :
            total_sum += power * arr[prime]
        else:
            return 0
    return total_sum
n= int(input())
arr = list(map(int,input().split()))
num = int(input())
print(calculate_sum(n,arr,num))
```

## RESULT

5 / 5 Test Cases Passed | 100 %