STUDENT REPORT

DETAILS

Name

M CHANDANA

Roll Number

3BR23CS086

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: $p^a \times q^b \times r^c \times \ldots \times z^f$,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:

```python
from collections import defaultdict
def prime_factors(num):
    factors=defaultdict(int)
    while num%2==0:
        factors[2]+=1
        num//=2
        for i in range(3,int(num**0.5)+1,2):
            while num%i==0:
                factors[i]+=1
                num//=i
        if num>2:
            factors[num]+=1
        return factors
def calculate_prime_index_sum(arr,num):
    if not arr:
        return -1
    factors=prime_factors(num)
    total_sum=0
    valid_prime_found=False
    for prime,power in factors.items():
        if prime < len(arr):
            total_sum+=power*arr[prime]
            valid_prime_found=True
    return total_sum if valid_prime_found else 0
n=int(input())
arr=list(map(int,input().split()))
num=int(input())
result=calculate_prime_index_sum(arr,num)
print(result)
```

RESULT

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