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STUDENT REPORT

DETAILS

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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

Source Code:

```
def prime_factors(n):
    factors = []
    # Check for number of 2s that divide n
    while n % 2 == 0:
        factors.append(2)
        n //= 2
    # n must be odd at this point, so check for odd fa
ctors
    for i in range(3, int(n**0.5) + 1, 2):
        while n % i == 0:
            factors.append(i)
            n //= i
    # This condition is to check if n is a prime numbe
r greater than 2
    if n > 2:
        factors.append(n)
    return factors

def calculate_weighted_sum(arr, num):
    if not arr:  # Check if the array is empty
        return -1

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

    for factor in factors:
        if factor < len(arr):  # Ensure that the index
is valid
            total_sum += arr[factor]
            found = True

    return total_sum if found else 0

# Main program to read input and execute the function
if __name__ == "__main__":
    import sys

    n = int(sys.stdin.readline().strip())  # Read the
size of the array
    arr = list(map(int, sys.stdin.readline().strip().s
plit()))  # Read the array
    num = int(sys.stdin.readline().strip())  # Read th
e integer num

    result = calculate_weighted_sum(arr, num)
    print(result)
```

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

RESULT

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