GCD Goodness

Sankalp's obsession for GCD is increasing day by day. Now he came up with this GCD question.

The *goodness* of array is defined as the product of sum of all the elements of the array and GCD of all the elements of the array.

In other words *goodness* of array *temp* of size k is equal to (temp[1]+temp[2]+...+temp[k])*gcd(temp[1],temp[2],...,temp[k]).

In this task you will be given an array and you have to find the sum of *goodness* of all non-empty subsequences of the given array.

Since the answer can be very large output it modulo 1 000 000 007 (1e9+7).

Definition of : Subsequence

Input

First line of the input is the number of elements in the given array.

Next line contains space separated array elements.

Output

Output the sum of *goodness* all the non-empty subsequences of the given array modulo 1e9+7.

Constraints

1 ≤ n ≤ 1 000 000

1 ≤ arr[i] ≤ 1 000 000

Example

Input:

4

2 4 6 9

Output:
350

Explanation

There will be 15 non-empty subsequences of the given array given as [2],[4],[6],[9],[2,4],[2,6], [2,9],... *too lazy to write them all* :P

Required ans = 2*2 + 4*4 + 6*6 + 9*9 + 6*2 + 8*2 + 11*1 + ... = 350.

Let me know in the comments if it doesn't match :P