



Summing Pieces

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Problem

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Consider an array, A , of length n . We can split A into contiguous segments called *pieces* and store them as another array, B . For example, if $A = [1, 2, 3]$, we have the following arrays of pieces:

- $B = [(1), (2), (3)]$ contains three 1-element pieces.
- $B = [(1, 2), (3)]$ contains two pieces, one having 2 elements and the other having 1 element.
- $B = [(1), (2, 3)]$ contains two pieces, one having 1 element and the other having 2 elements.
- $B = [(1, 2, 3)]$ contains one 3-element piece.

We consider the *value* of a piece in some array B to be $(\text{sum of all numbers in the piece}) \times (\text{length of piece})$, and we consider the *total value* of some array B to be the sum of the values for all pieces in that B . For example, the total value of $B = [(1, 2, 4), (5, 1), (2)]$ is $(1 + 2 + 4) \times 3 + (5 + 1) \times 2 + (2) \times 1 = 35$.

Given A , find the total values for all possible B 's, sum them together, and print this sum modulo $(10^9 + 7)$ on a new line.

Input Format

The first line contains a single integer, n , denoting the size of array A .

The second line contains n space-separated integers describing the respective values in A (i.e., a_0, a_1, \dots, a_{n-1}).

Constraints

- $1 \leq n \leq 10^6$
- $1 \leq a_i \leq 10^9$

Output Format

Print a single integer denoting the sum of the total values for all piece arrays (B 's) of A , modulo $(10^9 + 7)$.

Sample Input 0

```
3
1 3 6
```

Sample Output 0

```
73
```

Explanation 0

Given $A = [1, 3, 6]$, our piece arrays are:

- $B = [(1), (3), (6)]$, and *total value* $= (1) \times 1 + (3) \times 1 + (6) \times 1 = 10$.
- $B = [(1, 3), (6)]$, and *total value* $= (1 + 3) \times 2 + (6) \times 1 = 14$.

- $B = [(1), (3, 6)]$, and $total\ value = (1) \times 1 + (3 + 6) \times 2 = 19$.
- $B = [(1, 3, 6)]$, and $total\ value = (1 + 3 + 6) \times 3 = 30$.

When we sum all the total values, we get $10 + 14 + 19 + 30 = 73$. Thus, we print the result of $73 \bmod (10^9 + 7) = 73$ on a new line.

Sample Input 1

```
5
4 2 9 10 1
```

Sample Output 1

```
971
```

[f](#) [t](#) [in](#)

Submissions: [776](#)



Max Score: 40

Difficulty: Medium

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Current Buffer (saved locally, editable)  

Java 7



```
1 import java.io.*;
2 import java.util.*;
3 import java.text.*;
4 import java.math.*;
5 import java.util.regex.*;
6
7 public class Solution {
8     public static void main(String args[] ) throws Exception {
9         /* Enter your code here. Read input from STDIN. Print output to STDOUT */
10    }
11 }
12
```

Line: 1 Col: 1

 [Upload Code as File](#) ☐ Test against custom input

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