Problem A – Another Problem About Maximum in Range

Given a sequence of integers $a_1, a_2, \ldots, a_N$, find:

$$\left(\sum_{i=1}^{N}\sum_{j=i}^{N} \max(a_i, a_{i+1}, \cdots, a_j) \times \gcd(i,j)^2\right) \pmod{10^9+7}$$

where gcd is the greatest common divisor function.

Input

The first line of input contains an integer N $\left(1 \le N \le 5 \times 10^5\right)$, indicating the size of the sequence.

The second line contains N positive integers, a_i $\left(1 \le a_i \le 10^9\right)$, separated by spaces, representing the sequence of numbers.

Output

On a single line print the answer to the problem.

Sample input 1	Sample output 1
3 1 2 3	44

Notes

In the example, we have the sequence 1, 2, 3 with the following ranges:

1. $[1,1],[2,2],[3,3]$ whose maxima are $\max(a[1,1]) = 1$, $\max(a[2,2]) = 2$, $\max(a[3,3]) = 3$
2. $[1,2],[2,3]$ whose maxima are $\max(a[1,2]) = 2$, $\max(a[2,3]) = 3$
3. $[1,3]$ whose maximum is $\max(a[1,3]) = 3$

Thus, the sum is developed as

$$\begin{aligned}&\max(a[1,1]) \cdot \gcd(1,1)^2 + \max(a[2,2]) \cdot \gcd(2,2)^2 +\\ &\max(a[3,3]) \cdot \gcd(3,3)^2 + \max(a[1,2]) \cdot \gcd(1,2)^2 +\\ &\max(a[2,3]) \cdot \gcd(2,3)^2 + \max(a[1,3]) \cdot \gcd(1,3)^2\end{aligned}$$

Replacing the values, we get

$$\begin{aligned}&1 \cdot \gcd(1,1)^2 + 2 \cdot \gcd(2,2)^2 + 3 \cdot \gcd(3,3)^2 +\\ &2 \cdot \gcd(1,2)^2 + 3 \cdot \gcd(2,3)^2 + 3 \cdot \gcd(1,3)^2.\end{aligned}$$

and then

$$\begin{aligned}&1 \cdot 1^2 + 2 \cdot 2^2 + 3 \cdot 3^2 + 2 \cdot 1^2 + 3 \cdot 1^2 +\\ &3 \cdot 1^2 = 1 + 8 + 27 + 2 + 3 + 3 = 44.\end{aligned}$$

Finally, taking this result modulo $10^9 + 7$, we still get 44 since $44 < 10^9 + 7$.