Max Transform

HackerRank

Transforming data into some other data is typical of a programming job. This problem is about a particular kind of transformation which we'll call the *max transform*.

Let A be a zero-indexed array of integers. For $0 \leq i \leq j < \text{length}(A)$, let $A_{i \ldots j}$ denote the subarray of A from index i to index j, inclusive.

Let's define the *max transform* of A as the array obtained by the following procedure:

- Let B be a list, initially empty.
- For k from 0 to $\text{length}(A) - 1$:
  - For i from 0 to $\text{length}(A) - k - 1$:
    - Let $j = i + k$.
    - Append $\max(A_{i \ldots j})$ to the end of B.
- Return B.

The returned array is defined as the max transform of A. We denote it by $S(A)$.

Complete the function `solve` that takes an integer array A as input.

Given an array A, find the sum of the elements of $S(S(A))$, i.e., the *max transform* of the *max transform* of A. Since the answer may be very large, only find it modulo $10^9 + 7$.

Input Format

The first line of input contains a single integer n denoting the length of A.

The second line contains n space-separated integers $A_0, A_1, \ldots, A_{n-1}$ denoting the elements of A.

Constraints

- $1 \leq n \leq 2 \cdot 10^5$
- $1 \leq A_i \leq 10^6$

Subtasks

- For 33.33% of the total score, $1 \leq n \leq 4000$

Output Format

Print a single line containing a single integer denoting the answer.

Sample Input 0

```
3
```

```
3 2 1
```

Sample Output 0

```
58
```

Explanation 0

In the sample case, we have:

$$A = [3, 2, 1]$$
$$S(A) = [3, 2, 1, 3, 2, 3]$$
$$S(S(A)) = [3, 2, 1, 3, 2, 3, 3, 2, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3]$$

Therefore, the sum of the elements of $S(S(A))$ is 58.