F. SUPPOWER

Time limited: 5 seconds

Problem description

Given a sequence of n integers $x_1, x_2, ..., x_n$. We define two functions f, g as follow:

$f(x_i) = x_i$

$f(x_i, x_{i+1}) = x_i \char`^ x_{i+1}$

$f(x_i, x_{i+1}, ..., x_j) = x_i \char`^ f(x_{i+1}, x_{i+2}, ..., x_j)$

$g(i, j) = f(x_i, x_{i+1}, ..., x_j)$

Calculate sum of g(i, j) over all pair (i, j) such that $1 <= i <= j <= n$ modulo $10\char`^9 + 7$.

Input

The first line contains an integer n.

The second line contains n space-separated integers $x_1, x_2, ..., x_n$.

Output

Print answer in a single line.

Constraints

$1 <= n <= 10000$.

$1 <= x_i <= 10\char`^9$.

Example

Input:

5

1 5 9 2 2

Output:

409983298