Rating

Input file:	`standard input`
Output file:	`standard output`
Time limit:	4 seconds
Memory limit:	256 megabytes

After visting Edward the elephant's world-renowned restaurant, Leroy is very impressed and wants to give him a good rating on Yummy Eats for Lions rating Place (YELP).

However, ratings are given in a very odd way on YELP. Leroy will be given N positive integers ($1 \leq N \leq 1500$), and starts out with a rating R of 0.

Leroy will then repeat the following operation until **only one number** is left:

Choose any two numbers a and b from the numbers available and one of the expressions ($a^b \mod 10^9+7$) or ($b^a \mod 10^9+7$)

Add the result of the expression to r.

Finally, delete either a or b (ie: you can never use that number in an operation again).

Please help Leroy choose the set of $n-1$ operations such that the final rating r is maximized.

Output $r \mod 10^9+7$.

Input

The first line will contain an integer n. The next line will contain n space separated integers, the numbers that Leroy is given.

Output

Please output the final maximized $r \mod 10^9+7$. Note that you should maximize r, not $r \mod 10^9+7$.

Examples

standard input	standard output
3 1 2 3	12
10 1 10 2 9 3 7 4 6 5 4	354864278

Note

For the first test case, the rating can be maximized by adding 3^2, removing 2, then adding 3^1. This yields a total rating of $9 + 3 = 12$.