D. Multipliers

Ayrat has number n, represented as it's prime factorization p_i of size m, i.e. $n = p_1 \cdot p_2 \cdot \ldots \cdot p_m$. Ayrat got secret information that that the product of all divisors of n taken modulo $10^9 + 7$ is the password to the secret data base. Now he wants to calculate this value.

Input

The first line of the input contains a single integer m ($1 \le m \le 200\,000$) — the number of primes in factorization of n.

The second line contains m primes numbers p_i ($2 \le p_i \le 200\,000$).

Output

Print one integer — the product of all divisors of n modulo $10^9 + 7$.

Examples

input
2
2 3

output
36

input
3
2 3 2

output
1728

Note

In the first sample $n = 2 \cdot 3 = 6$. The divisors of 6 are 1, 2, 3 and 6, their product is equal to $1 \cdot 2 \cdot 3 \cdot 6 = 36$.

In the second sample $2 \cdot 3 \cdot 2 = 12$. The divisors of 12 are 1, 2, 3, 4, 6 and 12. $1 \cdot 2 \cdot 3 \cdot 4 \cdot 6 \cdot 12 = 1728$.