Problem A. Flower

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

There are N flowers in the flower shop. Uyom is so rich that he can buy all of them. But he can only buy one flower in one day.

Each flower has two positive integers a_i, b_i, which means the initial fragrance value of i-th flower is a_i, and if Uyom buys it on the t-th day, he will get $a_i + t \times b_i$ fragrance value. Uyom will buy the first flower at 0-th day and buy the last flower at $(n-1)$-th day. You should help him to decide the order of purchasing N flowers to achieve the maximum sum of fragrance value.

Print the maximum sum of fragrance value.

Input

The first line contains one integer N ($1 \le N \le 2 \times 10^5$), denoting the number of flowers.

The second line contains n integers a_i ($1 \le a_i \le 10^3$).

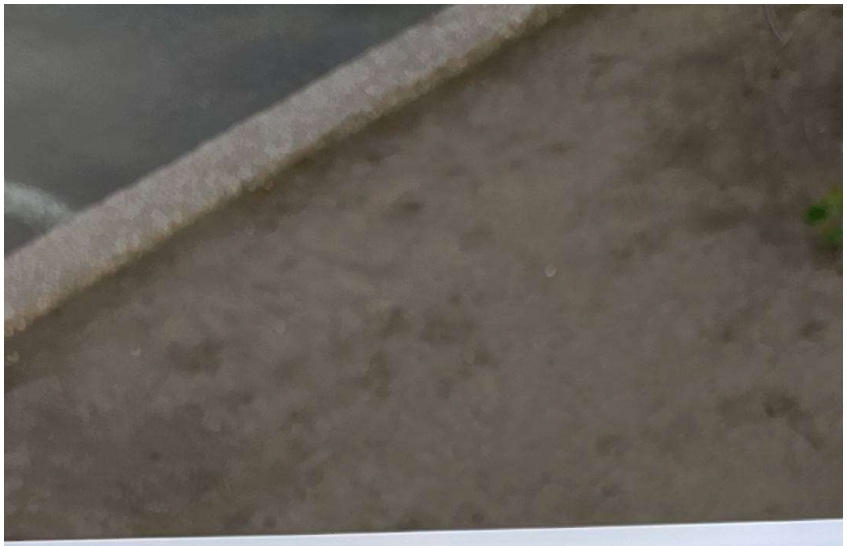
The third line contains n integers b_i ($1 \le b_i \le 10^3$).

Output

Print one integer – the maximum sum of fragrance value.

Example

standard input	standard output
5 4 6 6 6 1 10 4 8 9 6	82



Problem B. Elysia

Input file:	standard input
Output file:	standard output
Time limit:	1 second
Memory limit:	256 megabytes

Little Y is organizing a party.

There are n people at the party, numbered from 1 to n, and there are also n flowers, numbered from 1 to n. Initially, the flower i is held by the i-th person.

As part of the opening ceremony, they will perform several exchange operations. An exchange operation is defined as follows: choose two distinct numbers i and j, then swap the flowers held by the i-th and j-th person. Little Y discovered that after K operations, each person was holding the original flower they had at the beginning, and for any two distinct numbers i and j, the i-th and j-th person have exchanged their flowers at least once.

Little Y wants to know the minimum value of K such that there exists a sequence of exchange operations that satisfies the above conditions.

Input

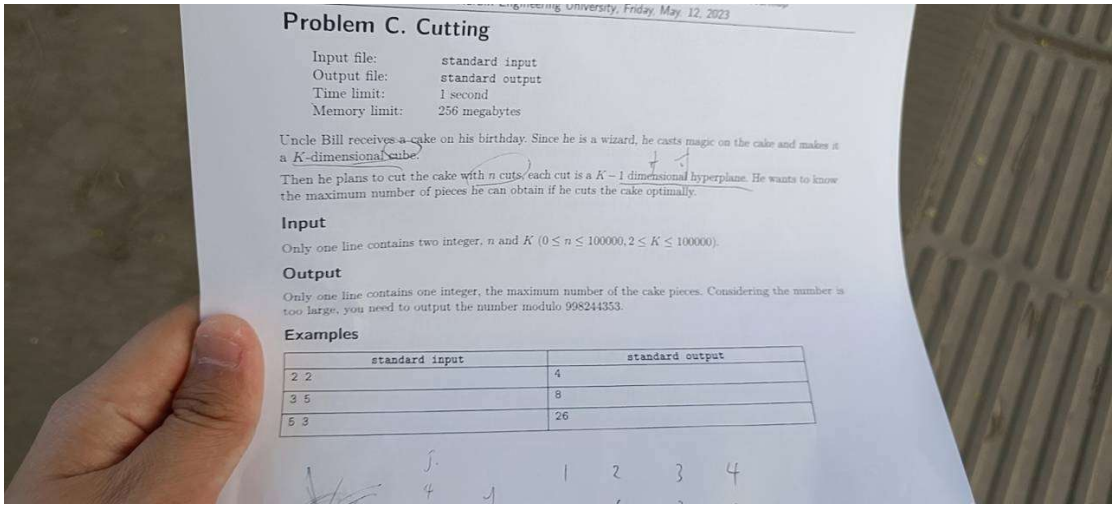
Only one line contains one integer n ($1 < n \le 1000000$), denoting the number of people attending the party.

Output

Output only one number K, denoting the minimum number of exchange operations.

Examples

standard input	standard output
2	2
3	4



...University, Friday, May 12, 2023

Problem C. Cutting

Input file:	standard input
Output file:	standard output
Time limit:	1 second
Memory limit:	256 megabytes

Uncle Bill receives a cake on his birthday. Since he is a wizard, he casts magic on the cake and makes it a K-dimensional cube.

Then he plans to cut the cake with n cuts, each cut is a $K-1$ dimensional hyperplane. He wants to know the maximum number of pieces he can obtain if he cuts the cake optimally.

Input

Only one line contains two integer, n and K ($0 \le n \le 100000, 2 \le K \le 100000$).

Output

Only one line contains one integer, the maximum number of the cake pieces. Considering the number is too large, you need to output the number modulo 998244353.

Examples

standard input	standard output
2 2	4
3 5	8
5 3	26

Problem D. Color counting

Input file:	standard input
Output file:	standard output
Time limit:	1 second
Memory limit:	512 megabytes

Fop_zz has a sequence of N cards and every card has a number a_i. And he likes to count how many cards in a section with a same number. Sometimes, he will swap two adjacent cards or add a card to the end of the sequence.

In one turn, he may ask you the number of card with number x in a given interval. Formally, you should count the number of $i \in [l, r], a_i = x$. Or he may swap the the order of two adjacent card. Formally, you are given an integer x and you should swap a_x and a_{x+1}. If he wants to add a card to the end of sequence, he will give you the number on the new card.

You should tell him the answer of all the counting request.

Input

The first line contains two integer $N, M (1 \le N, M \le 3 \times 10^5)$ representing the initial number of cards and the number of turns.

The second line contains N integers representing the number $a_i (1 \le a_i \le 3 \times 10^5)$ of the N cards.

The following M lines contains one of three type request:

- *cnt* l, r, x - counting the number of i that $i \in [l, r], a_i = x, 1 \le x \le 3 \times 10^5, 1 \le l, r \le$ *current number of card*
- *swp* x - swap a_x and $a_{x+1}, 1 \le x <$ *current number of card*
- *add* x - add a card with number x to the end of the current sequence, $1 \le x \le 3 \times 10^5$.

Output

For every *cnt* request, output a line contains a single integer to represent your answer.

It is guaranteed there is at least one *cnt* request.

Example

standard input	standard output
5 10 2 6 2 2 2 swp 2 cnt 1 2 6 swp 4 cnt 2 4 2 swp 3 cnt 3 5 2 swp 4 add 22 cnt 1 6 6 cnt 3 6 22	0 2 2 1 1