1.

Magic Trick

Bob the magician is performing a stage show. He has a pile of N cards much that each card has numbers from 1 to N and each card has a unique number on it

Bob wants to take out the take out the cards in increasing order which means 123... N as a part of his performance However, a cand can be taken out only from the top of the pile.

Three types of operations can be performed by Bob.

- Take a card from the bottom of the pile an move it to the top the cost for this operation is equal to the number written on the card being moved
- Take a card from the top of the pile and move to the bottom the cost for this operation is equal to the number written on the card being moved,
- Take out the required card from the top of the pile: This operation is free of cost

You are given the value of N and also an array AR which shows the order of cards in the pile from top to bottom.

Find the minimum cost Bob has to play in order to complete the performance . Since this cost can be large return the result Modulo 10^9/7.

NOTE: The array AR is always a permutation of numbers from 1 to N.

Input Format

The first line contains an integer N, denoting the number of cards. Each line i of the N subsequent lines(where 0<=i <N) containes an integer describing AR[i], which is the order of the cards from top to bottom.

Example:

Sample Input	Sample Output
3 3 2 1	3
…….	
5	15

3

5

1

4

2

2.

Game Winner

Kaito has defined two functions shown below:

1. **Minimum_divisor_of(X)** = The minimum integer u such that **X MOD u** =0 and u>1.

2. **Maximum_divisor_of(X)** = The maximum integer u such that **X MOD u**=0 and u<X.

Kaito and Khaled are playing a game using these functions. They have an array A of N integers and they take alternating turns doing operations on it. At each turn the player chooses an index i and an integer x such that **Minimum_divisor_of(Ai) <= x<=Maximum_divisor_of(Ai)** and subtracts x from Ai . The player who can't make a move loses. i.e. a player loses when there is no x satisfing the condition for any Ai.

You are given T games. Your task is to genrate a binary integer Z where the ith bit=1 if Kaito wins the ith game and the ith bit=0 if Kaito looses the game.Your final task is to return the decimal representation of Z.

Note: It is guaranteed that Kaito always plays the first turn in each game.

Input Format: The first line contains an integer T, denoting the number of rows in A.

The next line contains an integer N denoting the number of columns in A.

Each line i of the T subsequent lines(where 0<= i <T) contains N space seprated integers each describing the row A[i].

Example:

Sample Input	**Sample output**
1 3 4 4 4	1

……..

3 5

1

6

9

4

……..

3 1

2

6 9

3 7

4 4

=> Another Question

You are given two strings X and Y which are bascially numbers . you can replace any digit from Y string to X to make the X greater . The Strings X and Y can be of larger values.

3.

You are given a big number X which consists of N digits. You are also given a subsequence of digits Y of length M.
You can replace the digits in X with any digit i in Y(1<=i<=M) or leave it as it is.
What is the maximum Number that can be formed from X in the above manner?
Note: Since the number can be large output it modulo 10^9+7.
Input Format: The first line contains an integer N , denoting the length of big number X.
The next line contains a String X , denoting the big number.
The next line contains an Integer M , denoting the length of Y.
The next line contains a String Y, denoting the big number.
Example:

Sample Input Sample output

3 223

123

3

222

……

4 1124

1024

3

010

……

3 987

987

7

1234567

4.

You are the professor of a class of N students. All of these students have a unique roll number. The roll numbers of these students are given in an array called AR.

It is given that two students are friends, if the absolute difference of their roll numbers is exactly K.

You want to choose a non-empty subset of these students to do an assignment. However, you want to make sure that no two students that you choose are friends with one another so that no one cheats.

As a curious professor you are interested in finding the number of distinct ways to select non-empty subsets of students Since this value can be extremely large return it modulo 10^9 +7.

Note:

- It is necessary to select at least 1 student while forming a non-emply subsets

Input Format

The first line contains an integer, N, Number of students in the class the next line contains an integer, K. Each line i of the N subsequent lines (where 0 si < N) contains an integer describing

Constraints

1 <= N <= 10^5

1<= K <= 5000

1<= AR[] <= 10^9

5.

You are given the task to find the strongest number from a set of N different numbers.

The following rules can be used to identify the strongest number.

. The strongest number is the one which has the greatest integer as its n' root. This means that the mth root of a number A is a real number x that gives A, wheni raised to integer power m*.

• If two numbers have the same nth root (where n is maximum), the number with

higher value is chosen as the strongest number.

Input Format

The first line contains an integer, N, denoting the number of elements in arr. Each line i of the N subsequent lines (where 0 si < N) contains an integer describing arri.

Constraints 2 <= N <= 10^6

2 <= arr[i]<= 10^4

6.

Binary numbers only contain 0's and 1's. A binary number is said to be special if:

. It does not have any leading "0".

. It does not contain P consecutive "0".

Your task is to find the total number of special binary numbers of length N.

Since the answer can be very large, print the answer to modulo 10^9+7.

Input Format

The first line contains an integer, N, denoting the length of binary number The next line contains an integer, P. denoting the consecutive length limit of Ors in the number