Question 1: Dr. Dhruv is a superb professor of Mathematics. He is so lenient that he doesn't even take attendance. But his students are not so cooperative. Frustrating of all aspects is that students have stopped attending classes of Dr. Dhruv. Dr. Dhruv is really disappointed and he has decided to start taking attendance. There are A students in his class. Ordinary professors take a roll call as [1, 2, 3, ..., A] but Dr. Dhruv is no ordinary man. He has come up with a different method of taking roll call. His method is as follows:

He has a list B of K random integers which means that he will call out only K students. He will first treat the numbers [1, 2, 3, .., A] as strings ["1", "2", "3", .., "A"]. Then he will sort this vector of strings in lexicographic order (see example below). Now, Dr. Dhruv will call the numbers which are at B[i]-th (0 <= i < K) position in the sorted order (see example below).

Simply putting, if the sorted order is S, then he will call students in the order { S[B[0] - 1], S[B[1] - 1], ..., S[B[K-1] - 1] }. You need to output the numbers in the sequence that Dr. Dhruv will call.

Note: Dr. Dhruv needs this task to finish quickly and hence expected time complexity O(K*log(A))
Constraints:
1 <= K <= 1000 and K <= A
1 <= B[i] <= A (Elements of B may not be distinct, i.e, he can call a student multiple times)
1 <= A <= 10^9   (Yes, Dr. Dhruv can teach 10^9 students at a time)
Example:
Input:
A = 12, B = [2, 5]

Output:
ans = [10, 2]

Sorted list S: ["1", "10", "11", "12", "2", "3", "4", "5", ..., "9"]
ans = [2nd number, 5th number] = [10, 2]

Question 2: Batman is about to take off from Gotham's airport which has m runways(numbered from 1 to m) of length n units.
As always, the Joker has come up with an insane game to have fun with Batman.

The rules of the game are as follows::

- Batman's plane can take off only after running for n-units distance in the runways.
- Batman can start on any runway and end on any runway.
- Batman can switch his plane from runway i to j only if i and j are coprime.
- If the batman fails to switch his plane to a coprime runway, after running for 1 unit distance on a single runway, the Joker will bomb the plane.

The Joker does not want to kill the batman, because what will he do without him. So he asks for your help to find out number of ways in which Batman can take off his plane without getting bombed.

As the answer can be very large, output answer modulo (1000000007)

Input Format

First argument given is an Integer A, Length of the runway.
Second argument given is an Integer B, Number of different runways available

Output Format
Return a single integer X, the number of ways Batman can take off his plane without getting bombed.
As X can be very large, return X MOD 10^9+7

Constraints
1 <= A <= 1000000000
0 <= B <= 10

For Example
Input 1:
   A = 1
   B = 3
Output 1:
   3

Input 2:
   A = 2
   B = 3
Output 1:
   7

Explanation:
   For test 1:
      3 Ways Starting at 1, 2, 3

   For test 2:
      1st way: starting and covering whole distance at runway 1. i.e 1 -> 1
            (1 and 1 are co-prime so Batman can continue on runway 1 without getting bombed)
      2nd way: starting and covering distance of 1 at runway 1 and covering remaining distance at runway 2. i.e 1 -> 2
      3rd way: starting and covering distance of 1 at runway 1 and covering remaining distance at runway 3. i.e 1 -> 3
      similarly there are 4 more ways i.e 2 -> 1, 2 -> 3, 3 -> 1, 3 -> 2

      we can't go from 2 -> 2 and 3 -> 3 as per given rules.