Microsoft Amazon Adobe.

**Spiral print of 2D matrix.**

**Count Subsequences.**

Given a string, count the number of distinct subsequences of it ( including empty subsequence ). For the uninformed, A subsequence of a string is a new string which is formed from the original string by deleting some of the characters without disturbing the relative positions of the remaining characters. For example, "AGH" is a subsequence of "ABCDEFGH" while "AHG" is not.

2

AAA

ABCDEFG

4

128

**Meadian in a Stream of running integers**

You are given a running data stream of n integers. You read all integers from that running data stream and find effective median of elements read so far in efficient way. All numbers are unique in the datastream. Print only the integer part of the median.

1

6

5 15 1 3 2 8

5 10 5 4 3 4

Iteration 1 :  
Array = {5}  
Median = 5  
  
Iteration 2 :  
Array = {5,15}  
Median = (5+15)/2 = 10  
  
Iteration 3 :  
Array = {1,5,15}  
Median = 5  
  
Iteration 4 :  
Array = {1,3,5,15}  
Median = (3+5)/2 = 4  
  
Iteration 5 :  
Array = {1,2,3,5,15}  
Median = 3  
  
Iteration 6 :  
Array = {1,2,3,5,8,15}  
Median = (3+5)/2 = 4

**Substring containing Subsequence:**

Given strings, s1 and s2, find the minimum (contiguous) substring s of s1, so that s2 is a subsequence of that substring.  
If there is no such window in s1 that contains s2 as a subsequence, return the empty string "". If there are multiple, return the one with the left-most starting index.

aedfg

ef

edf

**Shortest Palindrome**

Given a string s, you are allowed to convert it to a palindrome by adding characters in front of it. Find and return the shortest palindrome you can find by performing this transformation.

aacecaaa

aaacecaaa

**Number of Island in the matrix.**

**Critical Edge:**

Given an undirected connected graph with n vertices numbered from 0 to n-1 and m edges. Print the number of edges whose removal makes the graph disconnected.  
A graph is said to be connected if it is possible to reach any vertex from any other vertex.

4 3

0 1

1 2

2 3

Sample Output

3

The graph is a tree hence by removing any edge,the graph becomes disconnected.

**Dream 11 IPL 2020:**

Mosina and Mohit are very excited in watching IPL match of MI vs CSK. But problem is that Mosina is fan of MI and Mohit is fan of CSK.So Mohit uses his mind and asks Mosina that if she will give answer to his question then Mohit will support MI otherwise Mosina will have to suport CSK for 19 Sep 2020 match. Mohit's question is:-  
As Monu is always interested in making money, so he decided to invest in some kind of precious pearls.But he is confused about when to buy and sell the pearl to get maximum profit. He decided to give this work to you, You have been given some future predictions of N days about the prices of the pearl in the form of an array A where the ith element denotes the price of the ith day. Also, there is a restriction on the number of pearls you can buy or sell. You can sell or buy at most K pearls.And initially you are having zero pearls.  
You have to find the maximum profit that can be made by buying and selling the pearls  
**Note :**You may not engage in multiple transactions at the same time

Sample Input

3 2

2 4 1

Sample Output

2

**IPL Tickets:**

Indian Premier League (IPL) 2020 will be held across all 3 venues in the United Arab Emirates -- Dubai, Abu Dhabi, and Sharjah from September 19 to November 8.  
Indian Premier League tickets are limited so, the Indian Government gives two random numbers a and b to the Dubai Government. Dubai Government wants to give the ticket to all candidates with IDs between a and b ( both inclusive ), However, due to coronavirus pandemic time Government can't give tickets to every candidate, Dubai Government decides to give the ticket to candidates having special ID,  
The property of a special ID is as follows:  
A special ID is not divisible by any number of the form p\*p where (p>1).  
So your task is to find the number of candidates getting the tickets.

Sample Input

1

1 10

Sample Output

7

Explanation

In given test case, 4 8 and 9 are not special.

**Decorate Tree:**

Ram has an apple tree in his garden. Since he is bored in the lockdown so he thought of decorating the tree.  
The nodes of the tree are numbered from 1 to n, where n is the total number of nodes and 1 is the root of the tree. While decorating the tree , Ram will put the light bulb of some color on every leaf node. A node is called happy if all light bulbs in the subtree of that node have different colors.  
Ram is interested in the following question: for each k from 1 to n, what is the minimum number of different colors needed to make the number of happy nodes be greater than or equal to k?  
A node u is called a leaf node if there is no node v such that to reach v from root, we have to travel through u.

Sample Input

3

1 1

Sample Output

1 1 2

Explanation

For k=1 and k=2 we can use only one color: nodes 2 and 3 will be happy. For k=3 we have to put the bulbs of different colors on 2 and 3, to make all the nodes happy.

**Save Dolby:**

Dolby is struck on an island and he wants to go to his home which is on another island. For the sake of this problem, assume an island is a 4-directionally connected group of 1s not connected to any other 1s. You are given a binary matrix with two islands (one where Dolby is currently and other where Dolby's home is), flip the minimum number of 0 in the binary matrix so that Dolby can go to his home ie. both the island become connected.  
The answer to the problem doesn't depend on the island where dolby currently is and you can assume any of the two island to be his current location.

Input Format

The first line contains two integer n (the number of rows in the matrix) and m (the number of columns in the matrix).  
Next n lines conatins m space separated integers ,the elements of the matrix.

Sample Input

2 2

1 0

0 1

Sample Output

1

Explanation

we can make the two islands connected by changing any one of the two zeros.

**Naughty Monkey**

There was this village where one day a man appeared and said that he wanted to buy monkeys. The villagers caught all the monkeys in the neighbourhood and sold them to him for a hundred rupees each. He has bought a monkey. This monkey is naughty. Monkey goes to another village .There are N buildings, numbered 1,2,…,N. For each i (1≤i≤N) the height of building i is h Naughty monkey who is initially on building 1. He will repeat the following action some number of times to reach building N: If the Naughty monkey is currently on building i,he can jump to one of the following: building i+1,i+2,…,i+K. Here, a cost of |hi−hj| is incurred, where j is the building to land on. Find the minimum possible total cost incurred before the Naughty monkey reaches building N.

Sample Input

5 3

10 30 40 50 20

Sample Output

30

**Transform to Favourite:**

Anmol got a string s1 as a present on his 18th birthday. But, he has a favourite string s2. Now, he wants to convert the string s1 to his favourite string s2.He can do the following operation any number of times:  
In one operation, he can convert all occurrences of one character in s1 to any other lowercase English character.  
He doesn't want to waste his energy so he wants you to tell if it is possible to convert s1 to s2 using the above operation any number of time.

Sample Input

aaa

bbb

Sample Output

Yes

**Anmol and Good Subarray:**

Anmol has an array of integers of length n. He considers an array good if, for every non-empty subarray of that array, the sum of elements in the subarray is non-zero.  
For example, array [−1,2,−3] is good, as all subarrays [−1], [−1,2], [−1,2,−3], [2], [2,−3], [−3] have nonzero sums of elements. However, array [−1,2,−1,−3] isn't good, as his subarray [−1,2,−1] has sum of elements equal to 0.  
He wants you to find the number of nonempty good subarrays of the array he has.  
An array c is a subarray of an array b if c can be obtained from b by deletion of several (possibly, zero or all) elements from the beginning and several (possibly, zero or all) elements from the end.

Sample Input

3

1 2 -3

Sample Output

5

**Frequent Updates:**

Given an array with n elements, initially all equal to 0.You are also given m updates where ith update is of the form:  
[start,end,increment] which means to increase all the elements of the array between the start index to end index(both inclusive) with increment.  
Print the final array as space separated integer.

Sample Input

5 3

1 4 1

2 4 1

3 4 1

Sample Output

0 1 2 3 3

**Nobita and Programming classes:**

Nobita has started taking Programming Classes. His teacher has given him a new assignment. Nobita has solved all the questions except for the last one. He needs your help in solving the last question. The question is:  
Given an array of n integers.Convert it to an array with at least k equal numbers in minimum operation.  
In one operation, you can choose any ai and set a[i]=a[i]/2(rounding down) , where a is the array given as input and i is any index of the array.  
Can you help him to solve the problem?

Sample Input

4 4

1 1 1 4

Sample Output

2

Explanation

To get at least 4 equal numbers, we can do 4 -> 2 -> 1.  
Then the array will be [1,1,1,1].  
The number of operation is 2 (4 -> 2 then 2-> 1).

**Evaluation of Postfix String:**

**Transform to favourite string:**

Anmol got a string s1 as a present on his 18th birthday. But, he has a favourite string s2. Now, he wants to convert the string s1 to his favourite string s2.He can do the following operation any number of times:  
In one operation, he can convert all occurrences of one character in s1 to any other lowercase English character.  
He doesn't want to waste his energy so he wants you to tell if it is possible to convert s1 to s2 using the above operation any number of time.

Sample Input

aaa

bbb

Sample Output

Yes

Explanation

We can convert a to b to get s2.

**Hitman Sharma:**

Rohit smashed 16 sixes during his knock of 209 against Australia in Bangalore in 2013. This was Rohit's first double ton and it helped India win a high-scoring series 3-2. Rohit Sharma is now known as a sixer king. While he is the most six-hitter in T20I history (127 sixes), he is also the third-most six-hitter in international cricket history (423 sixes), and fourth-most six-hitter in ODI history (244 sixes). He is also the most six hitters among the Indians in T20 cricket (361 sixes). Rohit Sharma has great hitting power. He only deals with six. fernandez is a fan of Rohit Sharma and is very excited to watch the IPL.Rohit Sharma played N Ipl matches and in every ith match count of sixes is given. Find the maximum count of matches for which the sixes are strictly increasing from the previous match.

Sample Input

1

8

10 9 2 5 3 7 19 18

Sample Output

4

**Fernandez Path:**

To be good at problem solving, Beretta thinks that Graphs are a topic one can definitely not skip. They have a variety of applications in Networks, flows , Routing and so on, even facebook is a good example of graph In Facebook, users are considered to be the vertices and if they are friends then there is an edge running between them. Facebook’s Friend suggestion algorithm uses graph theory. Facebook is an example of undirected graph.  
  
He has prepared some really interesting problems based on the same for talented programmers like you. He really adores his friends, and has chosen one of this close friends Nizel Fernandes as the main character for this task. So, this is how it goes :  
  
You have got a table of size N\*M containing integers. N is total number of row and M is total number of column.  
Initially cell (1, 1) contains one turtle named Nizel Fernandes. Nizel Fernandes wants to get to cell (N, M). Some cells of the table have obstacles(blocked cells). A cell is considered to be containing an obstacle if the value of the cell is a non prime number. That means that Nizel Fernandes can only move through prime number. It is guaranteed that upper left corner (1,1) contains a prime number.  
A prime number (or a prime) is a natural number greater than 1 that is not a product of two smaller natural numbers.  
Nizel Fernandes can go from cell (r, c) to one of three cells (r+ 1, c ), ( r , c + 1 ) and ( r + 1, c + 1 ) only if the required cell doesn't contain an obstacle the value of the cell is a prime number. Help him find the number of ways in which it can go from cell (1, 1) to cell (N, M). In addition, you need to print the lexicographically largest path to reach cell (N,M).  
Note: A cell (r1,c1)is lexicographically larger than another cell (r2,c2) if either (r1>r2) or if r1=r2 and c1>c2.A path A is lexicographically larger than another path B,  
Let, Path B: (1,1)(2,1)(3,1)(3,2)(3,3)  
Path A: (1,1)(2,1)(3,2)(3,3)  
Path A is lexicographically larger than another path B, because the first cell that does not match (i.e. (3,2) in A and (3,1) in B) is lexicographically larger in A than in B.

Sample Input

3 3

2 3 7

5 4 2

3 7 11

Sample Output

4

1 1

2 1

3 2

3 3

Explanation

There are four ways to reach (3,3) from (1,1).

Path 1. (1,1) (1,2) (1,3) (2,3) (3,3)  
Path 2. (1,1) (1,2) (2,3) (3,3)  
Path 3. (1,1) (2,1) (3,1) (3,2) (3,3)  
Path 4. (1,1) (2,1) (3,2) (3,3)

Lexicographical Order -> 4 > 3 > 2 > 1

**Coding blocks Ta:**

Rohan is preparing for his interview for the position of ta at Coding Blocks. He doesn't have much time to prepare, so he will mug up the solution to the problems that he is unable to solve. He came across one problem for which he couldn't find the solution. As he doesn't have much time, so he asked you for the solution and during the time you are solving the problem, he can do some other problem. The problem is:  
Given n dice each with m faces, numbered from 1 to m. Find the number of different ways to get x as the sum of values on all the dice.  
Can you help him?  
As the number can be large print it modulo 10^9+7.

Sample Input

3 6 18

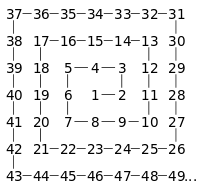
Sample Output

1

Explanation

The only way to get 18 as the sum is when 6 comes in all three dice.

**Isuru Udana and Prime:**

Isuru Udana, of the best competitive programmer of University of Colombo School of Computing. He is currently doing a research Internship in California University. Isuru Udana is busy with his research on prime numbers these days. Once, while roaming in the campus he saw numbers written in a spiral form and he observed that many prime numbers occur on both the diagonals .  
  
He wants to know what percentage of prime numbers is there on both the diagonals to that of all the numbers on the diagonal. Your task is to write a program to help Isuru Udana.

**Note**: Size of matrix is always odd and it is a square matrix.

Sample Input

2

7

3

Sample Output

61.538462

60.000000

**Nikita and Her Boyfriend:**

Nikita is making a colour full Graph as a birthday gift for her boyfriend, a fellow programmer! She has n integers. She wants to draw an undirected connected graph with N edge Each node is shaded in either red or black color. We define nr to be the number of red nodes and nb to be the number of black nodes. No 2 adjacent nodes have the same color.  
  
Last Night before the birthday party, Nikita's mischievous little brother removed the last n-2 number. She is really disappointed because she lost the last n-2 number. She calls you because you are her best friend. You suggest giving an array on the birthday. Nikita has only 2 numbers among these n numbers. These numbers are the first 2 numbers in n number. If she gifts simply these 2 numbers as an array, then her boyfriend will be disappointed. Nikita never wants her boyfriend to be disappointed at a birthday party. You suggest making it a magical array. property of magical:   
The shortest array such that bitwise xor of its elements is the first number and the sum of its elements is the second number . Can you help her to build this array Because you're her best friend.

Sample Input

4 10

Sample Output

2

3 7

Explanation

input : 0 0  
output : 0  
in this case sample the array is empty.

**Friend and Game:**

Two friends were playing a mind game, the game was as follows :  
Both players will get 4-4 chances each, player 1 will always go first, both players takes turn alternatively . They will roll the dice 8 times and note it, if even number comes that means **Increasing** else **Decreasing**, after 8 dice roll will start. so,the game is both players have to build the string with non repeating digit(1-9), whose value is minimum possible and the follows the relation . your task is to print final number.

For example, suppose after 2-2 turns they got relation as **Increasing**, **Decreasing**, **Decreasing**, **Increasing**. In this case final String will contains value from 1 to 5 And will be holding this relation between each consecutive digit, we have to print such minimum possible String. Here the answer will be **"14325"**.(1,4):**Increasing**, (4,3) :**Decreasing**, (3,2):**Decreasing**,(2,5):**Increasing.**

Sample Input

1

25426251

Sample Output

132456987

**Coding block Intern:**

Rohan recently got an internship of problem setter at Coding Blocks. His role at coding blocks includes making the problem for contest on HackerBlocks and writing their editorial. He made an interesting problem on Bst but he is unable to come up with the solution to the problem. As he can't add a problem without editorial, hence he is sad and asked you for help.Can you help him to solve the problem? The problem is:  
Given an array of integers which represents a permutation of integers from 1 to n. A Binary Search Tree is created from the elements of the array by adding elements in the order from the array to an initially empty bst. Find the number of ways to reorder the array in such a way that the bst created from the initial array is same as the bst created from reordered array when elements are added in order to an initailly empty bst.  
Since the number can be large, print it modulo 10^9 + 7.  
**Note:** The inital array is not counted.

Sample Input

3

2 3 1

Sample Output

1

Explanation

The array [2 1 3] will also give the same bst.