1. Counting Elements
   Given an integer array arr, count how many elements x there are, such that x + 1 is also in arr. If there are duplicates in arr, count them separately.
   Example
   Input: arr = [1,2,3]
   Output: 2
   Explanation: 1 and 2 are counted cause 2 and 3 are in arr.

   Example 2:
   Input: arr = [1,1,3,3,5,5,7,7]
   Output: 0
   Explanation: No numbers are counted, cause there is no 2, 4, 6, or 8 in arr.

   Constraints:
   - 1 <= arr.length <= 1000
   - 0 <= arr[i] <= 1000

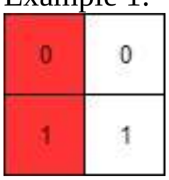
2. Perform String Shifts
   You are given a string s containing lowercase English letters, and a matrix shift, where shift[i] = [directioni, amounti]:
   - directioni can be 0 (for left shift) or 1 (for right shift).
   - amounti is the amount by which string s is to be shifted.
   - A left shift by 1 means remove the first character of s and append it to the end.
   - Similarly, a right shift by 1 means remove the last character of s and add it to the beginning.

   Return the final string after all operations.
   Example 1:
   Input: s = "abc", shift = [[0,1],[1,2]]
   Output: "cab"
   Explanation:
   [0,1] means shift to left by 1. "abc" -> "bca"
   [1,2] means shift to right by 2. "bca" -> "cab"
   Example 2:
   Input: s = "abcdefg", shift = [[1,1],[1,1],[0,2],[1,3]]
   Output: "efgabcd"
   Explanation:
   [1,1] means shift to right by 1. "abcdefg" -> "gabcdef"
   [1,1] means shift to right by 1. "gabcdef" -> "fgabcde"
   [0,2] means shift to left by 2. "fgabcde" -> "abcdefg"
   [1,3] means shift to right by 3. "abcdefg" -> "efgabcd"
   Constraints:
   - 1 <= s.length <= 100
   - s only contains lower case English letters.
   - 1 <= shift.length <= 100
   - shift[i].length == 2

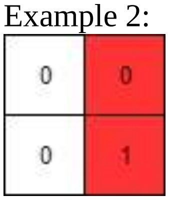
- directioni is either 0 or 1.
- 0 <= amounti <= 100

3. Leftmost Column with at Least a One
   A row-sorted binary matrix means that all elements are 0 or 1 and each row of the matrix is sorted in non-decreasing order.
   Given a row-sorted binary matrix binaryMatrix, return the index (0-indexed) of the leftmost column with a 1 in it. If such an index does not exist, return -1.
   You can't access the Binary Matrix directly. You may only access the matrix using a BinaryMatrix interface:
   - BinaryMatrix.get(row, col) returns the element of the matrix at index (row, col) (0-indexed).
   - BinaryMatrix.dimensions() returns the dimensions of the matrix as a list of 2 elements [rows, cols], which means the matrix is rows x cols.

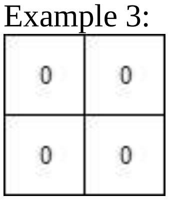
   Submissions making more than 1000 calls to BinaryMatrix.get will be judged Wrong Answer. Also, any solutions that attempt to circumvent the judge will result in disqualification.
   For custom testing purposes, the input will be the entire binary matrix mat. You will not have access to the binary matrix directly.

   Example 1:
   

   Input: mat = [[0,0],[1,1]]
   Output: 0

   Example 2:
   

   Input: mat = [[0,0],[0,1]]
   Output: 1

   Example 3:
   

   Input: mat = [[0,0],[0,0]]
   Output: -1

Constraints:

- rows == mat.length
- cols == mat[i].length
- 1 <= rows, cols <= 100
- mat[i][j] is either 0 or 1.
- mat[i] is sorted in non-decreasing order.

4. First Unique Number
You have a queue of integers, you need to retrieve the first unique integer in the queue.
Implement the FirstUnique class:
   - FirstUnique(int[] nums) Initializes the object with the numbers in the queue.
   - int showFirstUnique() returns the value of the first unique integer of the queue, and returns -1 if there is no such integer.
   - void add(int value) insert value to the queue.

Example 1:
Input:
["FirstUnique","showFirstUnique","add","showFirstUnique","add","showFirstUnique","add","showFirstUnique"]
[[[2,3,5]],[],[5],[],[2],[],[3],[]]
Output:
[null,2,null,2,null,3,null,-1]
Explanation:
FirstUnique firstUnique = new FirstUnique([2,3,5]);
firstUnique.showFirstUnique(); // return 2
firstUnique.add(5);   // the queue is now [2,3,5,5]
firstUnique.showFirstUnique(); // return 2
firstUnique.add(2);   // the queue is now [2,3,5,5,2]
firstUnique.showFirstUnique(); // return 3
firstUnique.add(3);   // the queue is now [2,3,5,5,2,3]
firstUnique.showFirstUnique(); // return -1

Example 2:
Input:
["FirstUnique","showFirstUnique","add","add","add","add","add","showFirstUnique"]
[[[7,7,7,7,7,7]],[],[7],[3],[3],[7],[17],[]]
Output:
[null,-1,null,null,null,null,null,17]
Explanation:
FirstUnique firstUnique = new FirstUnique([7,7,7,7,7,7]);
firstUnique.showFirstUnique(); // return -1
firstUnique.add(7);   // the queue is now [7,7,7,7,7,7,7]
firstUnique.add(3);   // the queue is now [7,7,7,7,7,7,7,3]
firstUnique.add(3);   // the queue is now [7,7,7,7,7,7,7,3,3]
firstUnique.add(7);   // the queue is now [7,7,7,7,7,7,7,3,3,7]
firstUnique.add(17);   // the queue is now [7,7,7,7,7,7,7,3,3,7,17]

firstUnique.showFirstUnique(); // return 17

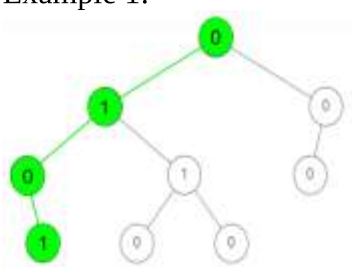
Example 3:
Input:
["FirstUnique","showFirstUnique","add","showFirstUnique"]
[[[809]],[],[809],[]]
Output:
[null,809,null,-1]
Explanation:
FirstUnique firstUnique = new FirstUnique([809]);
firstUnique.showFirstUnique(); // return 809
firstUnique.add(809); // the queue is now [809,809]
firstUnique.showFirstUnique(); // return -1

Constraints:

- 1 <= nums.length <= 10^5
- 1 <= nums[i] <= 10^8
- 1 <= value <= 10^8
- At most 50000 calls will be made to showFirstUnique and add.

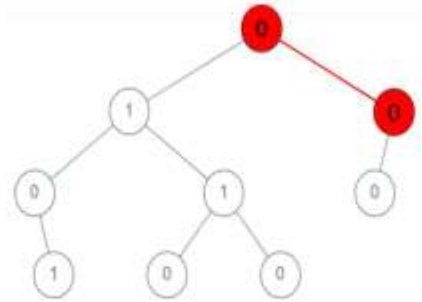
5. Check If a String Is a Valid Sequence from Root to Leaves Path in a Binary Tree
Given a binary tree where each path going from the root to any leaf form a valid sequence, check if a given string is a valid sequence in such binary tree.
We get the given string from the concatenation of an array of integers arr and the concatenation of all values of the nodes along a path results in a sequence in the given binary tree.

Example 1:



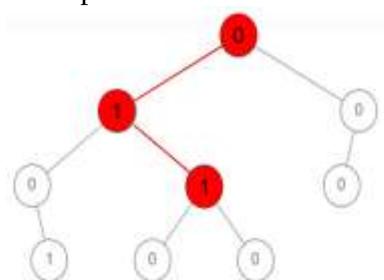
Input: root = [0,1,0,0,1,0,null,null,1,0,0], arr = [0,1,0,1]
Output: true
Explanation:
The path 0 -> 1 -> 0 -> 1 is a valid sequence (green color in the figure).
Other valid sequences are:
0 -> 1 -> 1 -> 0
0 -> 0 -> 0

Example 2:



Input: root = [0,1,0,0,1,0,null,null,1,0,0], arr = [0,0,1]
Output: false
Explanation: The path 0 -> 0 -> 1 does not exist, therefore it is not even a sequence.

Example 3:



Input: root = [0,1,0,0,1,0,null,null,1,0,0], arr = [0,1,1]
Output: false
Explanation: The path 0 -> 1 -> 1 is a sequence, but it is not a valid sequence.

Constraints:

- 1 <= arr.length <= 5000
- 0 <= arr[i] <= 9
- Each node's value is between [0 - 9].

6. Kids With the Greatest Number of Candies

There are n kids with candies. You are given an integer array candies, where each candies[i] represents the number of candies the ith kid has, and an integer extraCandies, denoting the number of extra candies that you have.
Return a boolean array result of length n, where result[i] is true if, after giving the ith kid all the extraCandies, they will have the greatest number of candies among all the kids, or false otherwise.
Note that multiple kids can have the greatest number of candies.

Example 1:
Input: candies = [2,3,5,1,3], extraCandies = 3
Output: [true,true,true,false,true]
Explanation: If you give all extraCandies to:
- Kid 1, they will have 2 + 3 = 5 candies, which is the greatest among the kids.
- Kid 2, they will have 3 + 3 = 6 candies, which is the greatest among the kids.
- Kid 3, they will have 5 + 3 = 8 candies, which is the greatest among the kids.

- Kid 4, they will have 1 + 3 = 4 candies, which is not the greatest among the kids.
- Kid 5, they will have 3 + 3 = 6 candies, which is the greatest among the kids.
Example 2:
Input: candies = [4,2,1,1,2], extraCandies = 1
Output: [true,false,false,false,false]
Explanation: There is only 1 extra candy.
Kid 1 will always have the greatest number of candies, even if a different kid is given the extra candy.
Example 3:
Input: candies = [12,1,12], extraCandies = 10
Output: [true,false,true]

Constraints:

- n == candies.length
- 2 <= n <= 100
- 1 <= candies[i] <= 100
- 1 <= extraCandies <= 50

7. Max Difference You Can Get From Changing an Integer
   You are given an integer num. You will apply the following steps exactly two times:
   - Pick a digit x (0 <= x <= 9).
   - Pick another digit y (0 <= y <= 9). The digit y can be equal to x.
   - Replace all the occurrences of x in the decimal representation of num by y.
   - The new integer cannot have any leading zeros, also the new integer cannot be 0.

   Let a and b be the results of applying the operations to num the first and second times, respectively.
   Return the max difference between a and b.

   Example 1:
   Input: num = 555
   Output: 888
   Explanation: The first time pick x = 5 and y = 9 and store the new integer in a.
   The second time pick x = 5 and y = 1 and store the new integer in b.
   We have now a = 999 and b = 111 and max difference = 888

   Example 2:
   Input: num = 9
   Output: 8
   Explanation: The first time pick x = 9 and y = 9 and store the new integer in a.
   The second time pick x = 9 and y = 1 and store the new integer in b.
   We have now a = 9 and b = 1 and max difference = 8

   Constraints:
   - 1 <= num <= 108

8. Check If a String Can Break Another String
   Given two strings: s1 and s2 with the same size, check if some permutation of string s1 can break some permutation of string s2 or vice-versa. In other words s2 can break s1 or vice-versa.
   A string x can break string y (both of size n) if x[i] >= y[i] (in alphabetical order) for all i between 0 and n-1.

   Example 1:
   Input: s1 = "abc", s2 = "xya"
   Output: true
   Explanation: "ayx" is a permutation of s2="xya" which can break to string "abc" which is a permutation of s1="abc".

   Example 2:
   Input: s1 = "abe", s2 = "acd"
   Output: false
   Explanation: All permutations for s1="abe" are: "abe", "aeb", "bae", "bea", "eab" and "eba" and all permutation for s2="acd" are: "acd", "adc", "cad", "cda", "dac" and "dca". However, there is not any permutation from s1 which can break some permutation from s2 and vice-versa.

   Example 3:
   Input: s1 = "leetcodee", s2 = "interview"
   Output: true

   Constraints:
   - s1.length == n
   - s2.length == n
   - 1 <= n <= 10^5
   - All strings consist of lowercase English letters.

9. Number of Ways to Wear Different Hats to Each Other
   There are n people and 40 types of hats labeled from 1 to 40.
   Given a 2D integer array hats, where hats[i] is a list of all hats preferred by the ith person.
   Return the number of ways that the n people wear different hats to each other.
   Since the answer may be too large, return it modulo 109 + 7.
   Example 1:
   Input: hats = [[3,4],[4,5],[5]]
   Output: 1
   Explanation: There is only one way to choose hats given the conditions.
   First person choose hat 3, Second person choose hat 4 and last one hat 5.
   Example 2:
   Input: hats = [[3,5,1],[3,5]]
   Output: 4
   Explanation: There are 4 ways to choose hats:
   (3,5), (5,3), (1,3) and (1,5)

Example 3:
Input: hats = [[1,2,3,4],[1,2,3,4],[1,2,3,4],[1,2,3,4]]
Output: 24
Explanation: Each person can choose hats labeled from 1 to 4.
Number of Permutations of (1,2,3,4) = 24.
Constraints:

- n == hats.length
- 1 <= n <= 10
- 1 <= hats[i].length <= 40
- 1 <= hats[i][j] <= 40
- hats[i] contains a list of unique integers.

10. Destination City
You are given the array paths, where paths[i] = [cityAi, cityBi] means there exists a direct path going from cityAi to cityBi. Return the destination city, that is, the city without any path outgoing to another city.
It is guaranteed that the graph of paths forms a line without any loop, therefore, there will be exactly one destination city.

Example 1:
Input: paths = [["London","New York"],["New York","Lima"],["Lima","Sao Paulo"]]
Output: "Sao Paulo"
Explanation: Starting at "London" city you will reach "Sao Paulo" city which is the destination city. Your trip consist of: "London" -> "New York" -> "Lima" -> "Sao Paulo".
Example 2:
Input: paths = [["B","C"],["D","B"],["C","A"]]
Output: "A"
Explanation: All possible trips are:
"D" -> "B" -> "C" -> "A".
"B" -> "C" -> "A".
"C" -> "A".
"A".
Clearly the destination city is "A".
Example 3:
Input: paths = [["A","Z"]]
Output: "Z"
Constraints:
1 <= paths.length <= 100
paths[i].length == 2
1 <= cityAi.length, cityBi.length <= 10
cityAi != cityBi
All strings consist of lowercase and uppercase English letters and the space character.