Round 1 Assessment Questions

1.Return the count of numbers that are not equal to a[0] and a[1] in the given array or Given an array of integers, count the number of elements that are not equal to the first two elements of the array. If the number of elements in the array is less than 2, then print 0.

2.Given an array num, check if a number is a palindromic number and return the array of such numbers in decreasing order.

3.Find the local maximum in a given 2D array.

4.Return the number of beautiful pairs.

5.Given an integer array of numbers i was asked to return the count of magical number pairs inside it ,a pair of numbers are called magical numbers when the pair of numbers are of same length and only one distinct digit in each numbers like (101,501) and (1,9) are also magical numbers as these numbers satisfy the condition ,an integer with count of such magical numbers should be returned.

6.Problem Statement: Given a list of integers, count the number of unique pairs (i, j) where the numbers differ by exactly one digit. Two numbers are considered to differ by one digit if they have the same number of digits, and all digits are identical except for one position.
Example:
Input:
[1, 151, 241, 1, 9, 22, 351]
Output:
3

7. Given a string, needed to find the substring of length 3 whose first and last character are same, return the count
input:'AbCzccc"

Output: 2

8.Given a string, needed to find the substring of length 3 whose first and last character are same, return the count
input:"abcxccc'

output:2

9. Find number of triplets in string with same first and last character.

10.Given a list of latencies and a threshold value, determine whether the difference between the maximum and minimum latencies is less than the threshold.

Input : latencies = [1, 3, 2, 5, 4]

threshold = 3

Output : 8

11)Longest sub array with difference of max(ele) in the window and min(ele) is should be less than or equal to threshold value. Return Maximum Size

Input:

array=[1,2,3,3,4,5],threshold=0

Output:

2 #[3,3]

12.Find Maximum size of subarray with maximum - minimum <= threshold

13. Given a list of words, calculate the absolute difference between the number of vowels and consonants for each word. Sort the words based on this difference in ascending order. If two words have the same difference, sort them alphabetically.

words = ['phenomenon', 'in']

output: ['in', 'phenomenon']

14.Multidimensional array [Matrix] backtracking problem

15.Given an Array arr[] with n numbers and return it in given Order For Example :

Input: arr[]={1, 2, 3, 4, 5, 6, 7};

Output: arr[]={1, 7, 2, 6, 3, 5, 4};

16.Given a string containing "L" and "R", where "L" means move the robot left and "R" means move the robot right, start from the origin (0) and return "L" if the final position is on the left, "R" if it is on the right, or " " if it remains at the origin.

17.Given an array of schedules containing the start times of events and also given a current time,

your task is to determine how long you have to wait for the event. From current time to last time it left.

Example:

Input: schedule =[“12:30”,”16:20”,”17:30”]

Current time:”16:00”

Output:

“00:20”

Input : schedule =[“11:00”,”13:40”]

current time :”14:00”

Output:

“-1”

18.You are given a list of bus departure times in 24-hour format ("HH:MM"). You are also given the current time in the same format. The task is to find the most recent bus departure time before the current time and return how many minutes have passed since it departed. If current time is exactly "00:00", return -1. If no bus has departed yet, return -1.

Example 1:

Input :

departure_times = ["11:20", "14:00", "18:40"]

current_time = "14:30"

Output:

30

Example 2:

Input :

departure_times = ["11:20", "14:00", "18:40"]

current_time = "00:00" Output :

-1

Example 3:

Input :

departure_times = ["07:10", "09:30", "12:15"]

current_time = "05:00" Output :

-1

19.shuttles arrive during the day. You are also given a current time in the same format.

Your task is to determine how many minutes ago the last shuttle arrived before the current time.

Constraints:

The shuttle arrival times are sorted in ascending order.

The current time is always after the first shuttle but may be before the first shuttle.

The current time is always in 24-hour format (00:00 to 23:59).

If no shuttle has arrived yet before the current time, return -1 (indicating no shuttle has arrived).

Input:

shuttleTimes = ["12:38", "14:00", "19:45"]

currentTime = "14:30"

Output:

05:15

20.For shuttle_times = ["12:30", "14:00", "19:55"] and current_time = "14:30", the output should be solution (shuttle_times, current_time) = "05:25".

Since the shuttle at "14:00" has already departed, the next arrival is at "19:55". The waiting time from "14:30" to "19:55" is "05:25"

21.Consider current time and find the last recently departured bus.

TC:1 - Current_time = “14:30”, departures = [“12:25”, “14:00”, “19:15”] => answer =

14:00
TC:2 - Current_time = “00:00”, departures = [“00”00”, “02:20”, “03:00”] => answer = -1, no previous departures from current_time.

22)Store the elements from the matrix in an array in a spiral form from top left. Calculate and return the sum of the elements at indices that are divisible by k in an array that is arranged in a spiral pattern starting from the top left.

Input: int[][] mat = {{1, 2, 3}, {4, 5, 6},
{7, 8, 9},
{10, 11, 12}};

K = 3

Output: 22

23. A matrix is given, and we need to traverse it in a spiral order. During traversal, we add the values located at indices divisible by 3.

24. Array is given

if a number contains 7 (twice or more) and its divisible by 3 need to take those count of the numbers

25.Count the elements that contain at least two occurrences of the digit 7 in the array and are divisible by 3.

Input :

arr = [77, 171, 273, 774, 717, 777, 147, 770]

Output :

3

26.Replace the nth consonant with the next Consonant in the given

String

Input: String str = “beComuS”

Output: beDomuT

27.Question: Write a program that takes a three character string as input and checks if the first and last characters are the same, ignoring case.

Input:

Axa

Output:

1

28.Question: Given an array of integers, reduce each element to a single-digit number by summing its digits repeatedly until a single digit is obtained. Then, find and print the most frequently occurring unique single-digit number. If there is a tie, print the smallest one.

Input:

arr = [38, 19, 77, 56, 45, 92, 100]

Output :

2

29.Given an array of integers, find the sum of digits of the numbers so that the array is of single digits only. Find the frequency of elements of the array after summing up the digits. If two numbers are in the same frequency print the greatest element.

30.Question: You are given three arrays: a, b, and queries. The queries array contains different types of operations:

->[1, x] → Find pairs (a[i], b[i]) where a[i] + b[i] = x and count them.

->[1, 1, x] → Update b[i] by adding x to b[i].

return the result array

31. A string array is given. We need to check whether the length of each string is even or odd. If the length is odd,

we reverse the string. If the length is even, we convert all its letters to uppercase

32. A train schedule with arrival times is given. We are also provided with the current time.

We need to determine the time remaining for the next train to arrive at the station.

33. A string array contains numbers prefixed with + or -. If a number has a +, we add it to a list. If a number has a -,

we remove it from the list. After each insertion or deletion,

we count the number of pairs in the list that have an absolute

difference of one and store this count in an array for each iteration.

34.Given an String array[] = [“+4”, “+2”, “+4”, “-2”] for every insertion and deletion we have to find every pair of elements which gives difference k. Return the resultant array

35.ADD OR SUBRACT TWO VALUES BASED IN THE SYMBOL IN THE SECOND ARRAY AND SEE THE FRIST AND SECOND RESULTS SAME PRINT BOOLEAN ARRAY AS OUTUT AS TRUE OR FALSE

ARR1=[3,6,7,1]

SYMB=[+,+,-,+]

ARR2=[2,1,5,2]

ARR3=[5,7,8,3]

RES=[TRUE,TRUE,FALSE,TRUE]

36.You are given four lists:

a: A list of integers.

b: A list of integers of the same length as a.

c: A list of integers representing the expected results.

sign: A list of strings, where each element represents a mathematical operation ('+', '-', '*', '/').

Your task is to implement a function that checks whether applying the corresponding operation from sign between a[i] and b[i] produces c[i]. The function should return a boolean list indicating whether each equation holds true.

37.Given a string array with linux commands cp,mv,ls and also since linux gives an indexing for these commands in order, so when we type !1 The first command would be called again likewise !2 or even !6, an integer array with the count of each command [ls,cp,mv] should be returned.

38. Count the number of times Unix commands(only three types) executed which includes !n commands

Similar:

INPUT : [“cp” , “ls” , “mv” , “mv” , “mv” , “!1” , “!3” , “!7”]

OUTPUT : [2,1,5]

EXPLANATION :

Normal commands should counted normally but other commands like “!1” represents the index of the input, if the input is “!n” then we should count the command that’s in

n-1 th index..

39.Given an integer target array we should return a result array of type integer which will have elements of target array on one condition that is if the target[i]>max(target[i-1],target[i+1]) then the element target[i] can be added inside the result array.Also the first and last element should be added inside the result array as the array as they wont have 2 neighbours.

40.Given an array of strings words and a width maxWidth, format the text such

that each line has exactly maxWidth characters and is fully (left and right) justified.

You should pack your words in a greedy approach; that is, pack as many words as you can in each line. Pad extra spaces ' ' when necessary so that each line has exactly maxWidth characters.

Extra spaces between words should be distributed as evenly as possible. If the number of spaces on a line does not divide evenly between words, the empty slots on the left will be assigned more spaces than the slots on the right.

For the last line of text, it should be left-justified, and no extra space is inserted between words.

41.blur entire image using radius by replacing the value at (x,y) with (sum(values in the radius of (x,y))//(number of values in the radius of (x, y)) + number at (x,y)) // 2

42.Given an array of number like arr = {5,2,3,1,6,4};

Such that we have a pair like {5,2} >> {2,5} , {3,1} >> {1,3}, {6, 4} >> {4,6};

For each subset the smaller value need to be swapped with the bigger value Output : {2,5,1,3,4,6}

43.Available product prices: [150, 120, 180, 90, 200]

User’s price range: (100, 170)

Expected Output: 120

Test Case 2:

Available product prices: [300, 250, 400, 500]

User’s price range: (100, 200)

Expected Output: 0

2.Input Matrix:

[[3, 0, 0],

[0, 1, 1],

[0, 0, 2]]

Expected Output: [[0, 0], [2, 2]]

Test Case 2:

Input Matrix:

[[5, 1, 0],

[2, 3, 4],

[1, 0, 2]]

Expected Output: [[0, 0], [1, 2]]

44. Palindrome

TC 1:

L = [121, 43, 88]

Output:

[121, 88]

45.Git Problem: (solved)
Given git commands (commit "branch", push filename), determine the branch with the highest number of files.

46.Array2 = [1, 0, -1, -1, 1]

Array1 contains profits and Array2 contains Robot moves. If robot move == 1 means, add the current index profit to the total, if robot move == 0 means, no need to add the profit, the total remains same, if the robot move == -1 means, sell the current index profit (i.e) subtract the current index profit from the total.

Example: i = 0

(i) i = 0, Array1[i] == 1 & Array2[i] == 1, Array2[i] == 1, so we can add the Array1[i] to the total => total = 1

(ii) i = 1, Array1[i] == 7 & Array2[i] == 0, Array2[i] == 0, so no change in the total, total => 1

(iii) i = 2, Array1[i] == 2 & Array2[i] == -1, Array2[i] == -1, so subtract Array1[i] from total, total => -1

(iv) i = 3, Array1[i] == 3 & Array2[i] == -1, Array2[i] == -1, so subtract Array1[i] from the total, total => -4

i = 4, Array1[i] == 5 & Array2[i] == 1, Array2[i] == 1, so add the Array1[i] to the total, total => 1

Example: i = 0

(v) i = 0, Array1[i] == 1 & Array2[i] == 1, Array2[i] == 1, so we can add the Array1[i] to the total => total = 1

(vi) i = 1, Array1[i] == 7 & Array2[i] == 0, Array2[i] == 0, so no change in the total, total => 1

(vii) i = 2, Array1[i] == 2 & Array2[i] == -1, Array2[i] == -1, so subtract Array1[i] from total, total => -1

(viii) i = 3, Array1[i] == 3 & Array2[i] == -1, Array2[i] == -1, so subtract Array1[i] from the total, total => -4

i = 4, Array1[i] == 5 & Array2[i] == 1, Array2[i] == 1, so add the Array1[i] to the total, total => 1

47.A newspaper company wants to design their front page of the news paper. You want to design the front page of their newspaper. The front page of the newspaper should contains only 16 characters in a row, if the title exists more than 16 characters, you can bring the word to the next line, if the word contains less than 16 character, you can add another word in the same row, but both of the words count should be less than 16 characters in a row. If not add one word in a row and

bring the next word to the next line. If one word size = 11 means, add spaces to the left and right side of the word and make it in centre of the page.

TC:1 - [[“Hello”, “World”], [“How areYou Doing”], [“Place the word in center by look out the space”]] Output:

[“ ********** “,

“* Hello World “, “*How areYou Doing”, “* Place the word ”, “ in center by *”,

“* look our the ”, “space *”

]

sample test case:

6 2 1

7 5 4

10 9 10

output:

-1 1 2

-1 0 1

-1 -1 -1

Input:

[

"Autodesk Acquires New Startup",

"In a recent move, Autodesk has acquired a new startup to enhance its portfolio.", "The acquisition is expected to bring innovative solutions to the market."

]

Output:

[

"", "* Autodesk Acquires New *",

"* Startup   *",

"* In a recent move, Autodesk ", " has acquired a new startup ", " to enhance its portfolio. *",

"* The acquisition is expected*", "* to bring innovative *",

"* solutions to the market. ", "*"

]

48.Next Shuttle Departure Time

49.Count Unique Pairs with One-Digit Difference

50. You are given a string array, and you need to find the count of all possible pairs where one string is a prefix (starting substring) of another string in the array.

sample test case:

["abc", "a", "ab"]

output = 3

solved this in O(N)

51.Given an array of integers, determine the contiguous subarray that has the maximum sum and return that sum.

input: [-2,1,-3,4,-1,2,1,-5,4]

output: 6 .Solved this question in O(N).

52.Given an array we have to return a array with swap of zig zag pattern. Input: [1,2,3,4,5] output: [1,5,2,4,3].

53.Given 2 Integer Arrays of A[4 ,5 ,23,9,3] which defines rates[i] and another Array of integer which is 0,-1,1 B[0,- 1,1,0,-1] which is strategy of selling and buying the stocks and k is given .

Where in strategy Array 1 = getting at price

-1 = selling at price 0 = hold in that day

54.Find a maximum profit and k is given , which is used to rotate the strategy of B[] Array..keeping the 0 0 1 1 as in Array and change other 1 and -1 or 0 at position.

55.The problem involves a matrix and a set of commands that modify it. The commands include:

1. Reverse a specific row → "reverse row r1"
2. Swap two rows → "swap row r1 r2"
3. Swap two columns → "swap column c1 c2"
4. Rotate the entire matrix by 90 degrees clockwise → "rotate 90" Solution

56.Given an array of news lines and the width of each line, your task is to format the newspaper for publishing. Each line's length should be equal to the given width. If the length of a news line is shorter than the width, add spaces to both the front and end. If the required space to be added is n, distribute it as follows:

- If n is odd, add n//2 - 1 spaces to the front and n//2 spaces to the end.
- If n is even, add n//2 spaces to both the front and end.

input:

paper=[[“hello”,”world”],[“python program”]] width=13

Output:

[*,

* hello world * ”,

* python *,

* program *,

**********]

57. Water Flow in a Grid

- Input: A grid of heights where water can only flow from a higher to a lower or equal height. It moves left, right, up, and down from the given start position.
- Output: A modified grid showing how far water can flow.

Example:

Input:

heights = [[8,3,2],

[9,5,3],

[7,8,4]]

start_row = 1, start_col = 1

Output:

[[-1, 1, 2],

[-1, 0, 1],

[-1, -1, -1]]

58.Given a 2D array, you will have to pop all the bubbles. A bubble is something which an integer will be surrounded by at least 2 neighbors of the same type. The primary condition is, to be an eligible bubble, it must be surrounded by at least two neighbors with the same number.

Ex: [

[1,2,1,1,2],

[1,1,0,2,0],

[1,0,2,1,1]

]

Consider this example:

[

[1,2,0,0,1],

[2,2,2,1,1],

[0,2,1,2,1]

]

So if you remove the bubbles, the numbers in the bubble will be replaced with 0.

[

[0,0,0,0,1],

[0,0,0,1,1],

[1,0,1,2,1]

]

Note that after popping the bubble, the remaining elements on top of the bubble are moved downwards.

59. String Transformation (k-th Consonant Change)

60.There has been given two arrays stratergy[] and stock[] and both were of same size, and now we have to return the profit based on the given two arrays, if stratergy

is -1 we have to subtract the stock in profit, if it is 1 we have to add stock to the profit, if it is 0 we have do nothing.

Input: [-1,1,0,1,-1]

[2,4,1,5,4]

Output: 3

61.Given an array of integers nums and a range nRange[i, j], find and return the smallest integer in nums that falls between low = nRange[0] and high = nRange[1] (both exclusive).

Input:

- nums: A list of integers.
- nRange: A list of two integers [low, high], defining the exclusive range.

Output:

- The smallest integer in nums that falls between low and high (exclusive).
- If no such element exists, return 0 .

Example 1: Input: nums = [4, 9, 1, 7, 5, 3, 12, 6, 8, 2] nRange = [2, 7]

Valid Numbers : [4, 5, 3, 6]

Smallest Number: 3

Output: 3

Example 2: Input: nums = [1, 2, 3, 4] nRange = [5, 10]

Valid Numbers (Between 5 and 10, Exclusive): None

Output: 0

Constraints:

- 1 <= len(nums) <= 10^5 (Large input possible)

- 10^6 <= nums[i] <= 10^6 (Supports large negative/positive numbers)

- nRange always contains two integers where nRange[0] < nRange[1]

62) Given a list of integers, print the first and last elements. Additionally, remove any element that does not satisfy the condition:

l[i+1]<=l[i]>=l[i−1]l[i+1] or l[i+1]>=l[i]<=l[i−1]l[i+1]

For example:

Input: [1, 3, 5, 3, 2, 0]

Output: [1, 5, 0]

63.Given a list of words, write a function that processes each word as follows:

- If the length of the word is even, convert it to uppercase.
- If the length of the word is odd, reverse the word.

The function should return a list with the processed words.

Input & Output

Example 1

Input:

words = ["hello", "world", "python", "AI", "code"]

Output:

['olleh', 'WORLD', 'nohtyp', 'AI', 'EDOC']

Example 2

Input:

words = ["chat", "gpt", "openai", "ml", "data"]

Output:

['CHAT', 'tpg', 'IAnepo', 'ML', 'ATAD']

64.Given a sentence, find the absolute difference for each word by subtracting the number of vowels from the number of consonants.

- If two words have the same absolute difference, sort them alphabetically.
- Otherwise, sort the words in ascending order based on their absolute difference.

Input & Output

Example 1

Input:

sentence = "apple orange grape banana"

Output:

['banana', 'orange','apple', 'grape']

65.Given a string, check for consonants. If there are consonants, replace them with the next consonant. If you come across ‘z’, replace it with ‘b’. Maintain the case of the letter – if it is uppercase, update it with the next consonant in uppercase, otherwise in lowercase. (solved)

66. Given two arrays A and B, and a required product Target, return the required answers for the given queries. The queries will be of two types:

a. [0,i,value]

b. [1, target]

So if you are given query (a), you should update A[i] as value.

If query (b) is given, you have to find the number of possible elements A[i] and B[j] such that A[i] + B[j] = target.

The required result is an array containing the results of query type (b).

Since finding all possible combinations A[i] + B[j] = target is O(n^2), and also the array is subject to change with queries of type (a), I was facing TLE due to high time complexity. Spent too much time trying to optimize it, used (target – a[i]) in b logic, which instead of using O(N^2) would use O(N) to find the required sum, but then 1 more case was failing.

67). This is again a string-based question(don't really remember what), but was very easy to solve. Solved in 1 minute.

68) Memory Allocation and Query Processing You are given an integer array memory, where:

- 0 represents free memory
- Any positive integer (uID) represents memory allocated to a user with that unique ID. Additionally, you are given a 2D queries array where each query is of two types:

1. Allocation Query: [0, k]

o Allocate k consecutive free memory slots.

o Memory can only be allocated starting at an index that is a multiple of 8 (0, 8, 16, 24,...).

o If allocation is successful, fill the memory with a unique ID (uID), starting from 1 and incrementing.

- If allocation is not possible, ignore the request.

2. Query for Consecutive Allocations: [1, uID]

- Find the largest contiguous block of memory allocated to uID.
- Return the size of the longest contiguous block belonging to u

Example 1:

Input:

memory = [0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0]

queries = [[0, 4], [0, 3], [1, 1], [1, 2]]

69.You are given two integer arrays a and b, along with a list of queries. Each query is of one of the following two types:

1. Update Query [0, index, element]

- Update a[index] with the new element.

2. Pair Count Query [1, target]

- Find how many pairs (a[i] + b[i] == target) exist and return the count.

Example 1:Input:

a = [1,3,2]

b = [4,2,1,3]

queries = [[1, 5], [0, 1, 2], [1, 5]]

70) Question:

You are given a string containing space-separated numbers. If any number has consecutive repeated digits (like 998 or 111), replace it with the sum of its digits. Otherwise, keep it unchanged.

The solution should have a time complexity of $O(n^2)$. Example Test Cases:

Input 1:

"123 45 6 998"

Output 1:

"123 45 6 26"

(Explanation: 998 → 9+9+8 = 26)

Input 2:

"11 234 99 876"

Output 2:

"2 234 18 876"

(Explanation: 11 → 1+1 = 2, 99 → 9+9 = 18)

71)You are given an N × N matrix containing integers. Your task is to find the indices of the

maximum and second maximum values present in the entire matrix.

Conditions:

1. Identify the highest value in the matrix and store its index.
2. Identify the second highest value in the matrix and store its index.
3. Return the indices in the format [[row1, col1], [row2, col2]].

Example Test Cases:

Example 1:

Input:

Matrix = [

[3, 0, 0, 0, 0],

[0, 0, 0, 1, 0],

[0, 0, 2, 0, 0],

[0, 0, 1, 0, 3]

]

Output:

[[0,0], [2,2]]

Explanation:

- Max value = 3 at [0,0]
- Second max value = 2 at [2,2]
- Output: [[0,0], [2,2]]

Constraints:

- $1 \leq N \leq 100$
- $-10^5 \leq Matrix[i][j] \leq 10^5$
- Time Complexity: $O(N \times N)$

72. Given an array a of n elements, task is to swap two number if the i > i + 1 and i + 2 > i + 3. If n in odd do nothing to n - 1