

Microsoft Cracker Sheet

Note: [To Use this sheet optimally go and watch the "Cracking the Microsoft coding interview 🔥: The definitive prep guide" video on Debug Buzz Channel.

Link - <https://youtu.be/hWVW1ns4HAg>]

Q) 24th July 2022 -

Given a byte array [0xxxxxxx, 1xxxxxxx, xxxxxxxx,]. We need to find the byte length of the last character.

If a character starts with 0, then it takes 1 byte and if the character starts with 1, then it consumes 2 bytes.

Ex :

01010011 -> will return a val 1 because it starts with 0, And the length of this char will be 1 only.

10100011 xxxxxxxx-> will return a val 2 because it starts with 1 so, it will also consume its next byte in the array i.e 10100011, 0/1xxxxxxx. And the length of this char will be 2.

This way we will keep moving in the array till the last element and need to find that whether the last element is 1 length or 2 length

- [11010011, 00100100, 01011101] : this will give 1 as answer, because last char is created with 1 byte as last byte is started with 0.
- [01010011, 10100100, 01011101] : this will give 2 as answer, because last char is created with two bytes as 2nd last byte is started with 1

This way, we need to return 1 if the last char in the byte array consumed 1 byte and return 2 if the last byte in the byte array consumed 2 bytes.

Q) 23rd July 2022 -

Equal Arrays

≡ Coding

DESCRIPTION

Problem Statement

You are given two arrays **A** and **B**. You have to make both the arrays equal by performing some operations on these arrays.

Arrays are said to be equal when they have the same size and all the corresponding elements are equal (i.e., $A[i] = B[i]$).

- In one operation, you can take a subarray of an array and replace it with a single integer which is the sum of all the elements of this subarray.

You can perform this operation on any of the arrays.

Return the maximum length of the arrays that you can achieve such that both the arrays are equal. If it is impossible to make both arrays equal, then return -1.

Input Format

- The first line contains the integer **N**, denoting the size of the array **A**.
- The following **N** lines contain the integers of the array **A**.

arrays equal, then return -1.

Input Format

- The first line contains the integer N , denoting the size of the array A .
- The following N lines contain the integers of the array A .
- The following line contains the integer M .
- The following M lines contain the integers of the array B .

Constraints

- $1 \leq N, M \leq 10^5$
- $1 \leq A[i], B[i] \leq 10^4$

Output Format

- Return the maximum length of the resulting arrays such that both of them are equal.

Evaluation Parameters

- Sample Input

4

1

3

both of them are equal.

Evaluation Parameters

- **Sample Input**

```
4
1
3
2
4
3
4
2
4
```

- **Sample Output**

```
3
```

- **Explanation**

You will apply the operation on the subarray $A[1:2] = [1, 3]$, which will give us the final arrays, $A = [4, 2, 4]$ and $B = [4, 2, 4]$. As they are equal, the answer is 3.

Q) 20th July 2022 -

A garbage truck collects plastic, metal and glass garbages(one at a time) from N houses.

Array D consists of time taken by the truck to carry a particular garbage from i th house.

Array T consists of string values(M -> Metal, G -> Glass, P -> Plastic) stating the type of garbages present in i th house.

Calculate the minimum time taken by the truck to collect all the garbages and return back to its garage.

Example Test Cases:

Test Case 1:

Input:

D: [3, 2, 4]

T: ["MPM", "", "G"]

Output:

19

Explanation: For house at 0th house metal truck will take 3 hours to arrive,

2 hours to pick up garbage and 3 hours to go back i.e. 8 hours total.

Plastic truck will take 3 hours to arrive at 0th house, 1 hour to pick up garbage and 3 hours to go back again, total of 7 hours. Glass truck will take $3+2+4=9$ hours

to arrive at 2nd house, 1 hour to pick up garbage and 9 hours again to go back,

making it a total time of 19 hours. Hence, the minimum time taken for all the

garbages to be collected is 19 hours.

Test Case 2:

Input:

D: [2,1,1,1,2]

T: ["", "PP", "PP", "GM", ""]

Output:

12

Explanation: Plastic truck will take 4 hours to reach 2th house, 2 hours to collect from 2th house, 2 hours to collect from 1th house and 4 hours to go back again, total 12 hours. Glass truck will take 5 hours to arrive at 3rd house,

1 hour to collect garbage and 5 hours to go back, making a total of 11 hours.

Same for metal truck.

Constraints:

Number of elements in D and T array can have max of 10^5 .

Each string length in T array can have max length of 10^5 .

Q) 17th July 2022 -

Given two string arrays of cities and states in a country, and given a target string, find if it is of the form of "valid city-valid state".

(catch: if a city or state consists of two words (space separated), then in the target string that space can be replaced with a hyphen or can be space also. Both are valid configurations.)

Q) 12th July 2022 -

An array A consisting of N integers is given. The elements of

array A together represent a chain, and each element

represents the strength of each link in the chain. We want to

divide this chain into three smaller chains.

All we can do is to break the chain in exactly two non-adjacent

positions. More precisely, we should break links P, Q ($0 < P < Q$

$< N - 1, Q - P > 1$), resulting in three chains $[0, P - 1], [P, Q - 1], [Q, N - 1]$.

- The total cost of this operation is equal to $A[P] + A[Q]$.

For example, consider array A such that:

$A[0]=5$

$A[1]=2$

$A[2]=4$

$A[3]=6$

A[4]=3

A[5]=7

We can choose to break the following links:

(1, 3): total cost is $2 + 6 = 8$

, 4): total cost is $2 + 3 = 5$

(2,

,4): total cost is $4 + 3 = 7$

Write a function:

```
class Solution ( public int solution(int[] A); }
```

that, given an array A of N integers, returns the minimal cost of dividing chain into three pieces.

For example, given:

the function should return 5, as explained above.

Q) 9th July 2022 -

Basically design a data structure that supports interval insertion and querying to check if an int lies withing any of the interval

Ex

Insert (1,5)

Insert (8,9)

IsPresent(4) -> True

IsPresent(8) -> Treu

IsPresent(0) -> False

Q) 8th July 2022 -

You are given data in below format, which have expense information of a user with date and time. You need to design a class/function to give monthly bill of a user. This information can be represented as object of a class. Please suggest what should be the right approach for this question.

```
{
  {
    account_id:"xsdcfvgbh123"
    Date_time:"11/11/2022 09:44"
    amount : "9990.87"
  },
  {
    account_id:"dasda124443"
    Date_time:"03/09/2022 09:44"
    amount : "7688.70"
  },
  {
    account_id:"ouyh13h123"
    Date_time:"19/01/2022 09:44"
    amount : "977.30"
  }
}
```

Q) 6th July 2022 -

<https://leetcode.com/discuss/interview-question/1937426/microsoft-oa-number-of-slices-to-sort-an-array>

Q) 6th July 2022 -

<https://stackoverflow.com/questions/62392510/find-and-format-visually-aesthetically-pleasant-pattern-of-trees-in-a-forest-usi>

Q) 4th July 2022 -

You are given 4 integers. Match them with the coordinates of two points and return the maximum possible square distance between the points.

Q) 4th July 2022 -

<https://leetcode.com/problems/count-good-nodes-in-binary-tree/>

Q) 4th July 2022 -

Given an array with revenue and expenses of a company (revenues are positive items in array, expenses are negative items) you can relocate expenses to the end of the array to make sure that in each point in time, the sum does not become negative. Return min number of relocations needed

Q) 1st July 2022 -

Given an integer n, return any array containing n unique integers such that they add up to 0.

Example 1:

Input:5

Output: [-4,-2,0,2,4]

Example 2:

Input:3

Output: [-2, 0, 2]

Example 3:

Input:1

Output: [0]

Q) 1st July 2022 -

Find N Unique Integers Sum up to Zero

Given an integer n, return any array containing n unique integers such that they add up to 0.

Example 1:

Input: n = 5

Output: [-7,-1,1,3,4]

Explanation: These arrays also are accepted [-5,-1,1,2,3], [-3,-1,2,-2,4].

Example 2:

Input: n = 3

Output: [-1,0,1]

Example 3:

Input: n = 1

Output: [0]

Constraints:

$1 \leq n \leq 1000$

Q) 1st July 2022 -

You are a programmer in a scientific team doing research into particles. As an experiment, you have measured the position of a single particle in N equally distributed moments of time. The measurement made in moment K is recorded in an array particles as particles[K].

Now, your job is to count all the periods of time when the movement of the particle was stable. Those are the periods during which the particle doesn't change its velocity: i.e. the difference between any two consecutive position measurements remains the same. Note that you need at least three measurements to be sure that the particle didn't change its velocity.

For Example

1, 3, 5, 7, 9 is stable (velocity is 2)

7, 7, 7, 7 is stable (particle stays in place)

3, -1, -5, -9 is stable (velocity is 4)

0, 1 is not stable (you need at least three measurements)

1, 1, 2, 5, 7 is not stable (velocity changes between measurements)

More formally, your task is to find all the periods of time particles[P], particles[P+1], ...particles[Q] (of length at least 3) during which the movement of the particle is stable.

Note that some periods of time might be contained in others (see below example).

Example:

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

Output: 5

Explanation: Possible periods of time for which velocity is stable are:

values location(from, to) Velocity

[-1, 1, 3] (0,2) 2

[3, 3, 3] (2,4) 0

[3, 2, 1, 0] (6,9) -1

[3, 2, 1] (6,8) -1

[2, 1, 0] (7,9) -1

Note: Last two periods are contained by (6,9)

Write a function:

```
public static int particleVelocity(int[] particles)
```

that given array particles consisting of N integers representing the results of the measurements, returns the number of periods of time when the movement of the particle was stable. The function should return -1 if the result exceeds 10^9 .

More examples:

Example 1:

Input: [1, 3, 5, 7, 9]

Output: 6

Explanation: Possible periods of time for which velocity is stable are:

values location(from, to) Velocity

[1, 3, 5] (0,2) 2

[3, 5, 7] (1,3) 2

[5, 7, 9] (2,4) 2

[1, 3, 5, 7, 9] (0,4) 2

[1, 3, 5, 7] (0,3) 2

[3, 5, 7, 9] (1,4) 2

Example 2:

Input: [7, 7, 7, 7]

Output: 3

Explanation: Possible periods of time for which velocity is stable are:

values location(from, to) Velocity

[7, 7, 7, 7] (0,3) 0

[7, 7, 7] (1,3) 0

[7, 7, 7] (0,2) 0

Q) 1st July 2022 -

An integer array is called arithmetic if it consists of at least three elements and if the difference between any two consecutive elements is the same.

For example, [1,3,5,7,9], [7,7,7,7], and [3,-1,-5,-9] are arithmetic sequences.

Given an integer array `nums`, return the number of arithmetic subarrays of `nums`.

A subarray is a contiguous subsequence of the array.

Example 1:

Input: `nums = [1,2,3,4]`

Output: 3

Explanation: We have 3 arithmetic slices in `nums`: [1, 2, 3], [2, 3, 4] and [1,2,3,4] itself.

Example 2:

Input: `nums = [1]`

Output: 0

Constraints:

$1 \leq \text{nums.length} \leq 5000$

$-1000 \leq \text{nums}[i] \leq 1000$

Q) 1st July 2022 -

There are N trees in the forest (numbered from 0 to $N-1$). The K th tree is located at coordinates $(X[k], Y[k])$.

We want to build the largest possible vertical path so that there is no tree. The path must be established somewhere between the leftmost tree and the rightmost tree, which means that the width of the path is not infinite.

Write a function:

public static Integer solution(int[] X, int[] Y), given the N integers to form the X and Y of the array, they indicate the position of the tree, then return the most constructable The width of the wide path.

Example

Given X=[1,8,7,3,4,1,8] , Y=[6,4,1,8,5,1,7] , the function should return 3.

Q) 1st July 2022 -

Given an array of non-negative integers arr, you are initially positioned at start index of the array. When you are at index i, you can jump to i + arr[i] or i - arr[i], check if you can reach to any index with value 0.

Notice that you can not jump outside of the array at any time.

Example 1:

Input: arr = [4,2,3,0,3,1,2], start = 5

Output: true

Explanation: All possible ways to reach at index 3 with value 0 are:

index 5 -> index 4 -> index 1 -> index 3

index 5 -> index 6 -> index 4 -> index 1 -> index 3

Example 2:

Input: arr = [4,2,3,0,3,1,2], start = 0

Output: true

Explanation: One possible way to reach at index 3 with value 0 is:

index 0 -> index 4 -> index 1 -> index 3

Example 3:

Input: arr = [3,0,2,1,2], start = 2

Output: false

Explanation: There is no way to reach at index 1 with value 0.

Constraints:

$1 \leq \text{arr.length} \leq 5 * 10^4$

$0 \leq \text{arr}[i] < \text{arr.length}$

$0 \leq \text{start} < \text{arr.length}$

Q) 1st July 2022 -

You are given two arrays A and B consisting of N integers each.

Index K is named fair if the four sums $(A[0] + \dots + A[K-1])$, $(A[K] + \dots + A[N-1])$, $(B[0] + \dots + B[K-1])$ and $(B[K] + \dots + B[N-1])$ are all equal, In other words, K is the index where the two arrays, A and B, can be split (into two non-empty arrays each) in such a way that the sums of the resulting arrays' elements are equal.

For example, given arrays A = [4, -1, 0, 3] and B = [-2, 5, 0, 3], index K = 2 is fair. The sums of the subarrays are all equal: $4 + (-1) = 3$; $0 + 3 = 3$; $-2 + 5 = 3$ and $0 + 3 = 3$.

Example

Example 1:

Input: [4,-1,0,3] [-2,5,0,3]

Output: 2

Example 2:

Input: [2,-2,-3,3] [0,0,4,-4]

Output: 1

Example 3:

Input: [4,-1,0,3] [-2,6,0,4]

Output: 0

Example 4:

Input: [1,4,2,-2,5] [7,-2,-2,2,5]

Output: 2

Q) 1st July 2022 -

You are given an array of strings `arr`. A string `s` is formed by the concatenation of a subsequence of `arr` that has unique characters.

Return the maximum possible length of `s`.

A subsequence is an array that can be derived from another array by deleting some or no elements without changing the order of the remaining elements.

Example 1:

Input: `arr = ["un","iq","ue"]`

Output: 4

Explanation: All the valid concatenations are:

- ""
- "un"
- "iq"
- "ue"
- "uniq" ("un" + "iq")
- "ique" ("iq" + "ue")

Maximum length is 4.

Example 2:

Input: `arr = ["cha","r","act","ers"]`

Output: 6

Explanation: Possible longest valid concatenations are "chaers" ("cha" + "ers") and "acters" ("act" + "ers").

Example 3:

Input: arr = ["abcdefghijklmnopqrstuvwxyz"]

Output: 26

Explanation: The only string in arr has all 26 characters.

Example 4:

Input: arr = ["aa","bb"]

Output: 0

Explanation: Both strings in arr do not have unique characters, thus there are no valid concatenations.

Constraints:

$1 \leq \text{arr.length} \leq 16$

$1 \leq \text{arr}[i].\text{length} \leq 26$

arr[i] contains only lowercase English letters.

Q) 1st July 2022 -

Given an array A of N integers, returns the largest integer $K > 0$ such that both values K and -K exist in array A. If there is no such integer, the function should return 0.

Example 1:

Input: [3, 2, -2, 5, -3]

Output: 3

Example 2:

Input: [1, 2, 3, -4]

Output: 0

Q) 1st July 2022 -

There are N balls positioned in a row. Each of them is either red or white . In one move we can swap two adjacent balls. We want to arrange all the red balls into a consistent segment. What is the minimum number of swaps needed?

Given string S of length N built from characters "R" and "W", representing red and white balls respectively, returns the minimum number of swaps needed to arrange all the red balls into a consistent segment. If the result exceeds 10^9 , return -1.

Also See: [Microsoft Online Assessment Questions and Solution](#)

Example 1:

Input:WRRWWR

Output: 2

Explanation:

We can move the last ball two positions to the left:

swap R and W -> WRRWRW

swap R and W -> WRRRWW

Example 2:

Input:WWRWWWRWR

Output: 4

Explanation:

We can move the last ball two positions to the left:

swap R and W -> WWRWWRRW

swap R and W -> WWWRWWRRW

swap R and W -> WWWWRWRRW

swap R and W -> WWWWWRRRW

Example 3:

Input:WR repeated 100000 times.

Output: -1

Explanation:

The minimum needed number of swaps is greater than 10^9 . So return -1.

Example 4:

Input:WWW

Output: 0

Explanation:

There are no red balls to arrange into a segment.

Q) 1st July 2022 -

Given an array of strings arr. String s is a concatenation of a sub-sequence of arr which have unique characters. Return the maximum possible length of s.

Example 1:

Input: arr = ["un","iq","ue"]

Output: 4

Explanation: All possible concatenations are "", "un", "iq", "ue", "uniq" and "ique".

Maximum length is 4.

Example 2:

Input: arr = ["cha","r","act","ers"]

Output: 6

Explanation: Possible solutions are "chaers" and "acters".

Example 3:

Input: arr = ["abcdefghijklmnopqrstuvwxyz"]

Output: 26

Constraints:

$1 \leq \text{arr.length} \leq 16$

$1 \leq \text{arr}[i].\text{length} \leq 26$

arr[i] contains only lower case English letters.

Q) 1st July 2022 -

Given a string s containing only a and b, find longest substring of s such that s does not contain more than two contiguous occurrences of a and b

Example 1:

Input: aabbaaaaabb

Output: aabbaa

Example 2:

Input: aabbaabbaabbaaa

Output: aabbaabbaabbaa

Q) 1st July 2022 -

String Without 3 Identical Consecutive Letters

Given a string str having letters, shrink the string to no more than 2 character consecutively exists.

Example 1:

Input: ssupppss

Output: ssupss

Explanation: Here "p" is repeated 3 times so it's deleted

Example 2:

Input: uvuuu

Output: uvuu

Explanation: Here we can see that “u” was repeated 3 times so it’s deleted, if the letters are “uuuu” then it will be “uu” the letter cannot be more than 2 times in case of “uuuuu” it will be “uu”.

Q) 1st July 2022 -

You are given a string **SS** of length **NN** containing only characters **a** and **b**. A substring (contiguous fragment) of **SS** is called a semi-alternating substring if it does not contain three identical consecutive characters. In other words, it does not contain either **aaa** or **bbb** substrings. Note that whole **SS** is its own substring.

Write a function, which given a string **SS**, returns the length of the longest semi-alternating substring of **SS**.

Example 1:

Input: baaabbabbb

Output: 7

Explanation: the longest semi-alternating substring is aabbabb

Example 2:

Input: babba

Output: 5

Explanation: Whole **S** is semi-alternating.

Example 3:

Input: abaaaa

Output: 4

Explanation: The first four letters of S create a semi-alternating substring.

Q) 1st July 2022 -

Alexa is given n piles of equal or unequal heights. In one step, Alexa can remove any number of boxes from the pile which has the maximum height and try to make it equal to the one which is just lower than the maximum height of the stack. Determine the minimum number of steps required to make all of the piles equal in height.

Example 1:

Input: piles = [5, 2, 1]

Output: 3

Explanation:

Step 1: reducing 5 -> 2 [2, 2, 1]

Step 2: reducing 2 -> 1 [2, 1, 1]

Step 3: reducing 2 -> 1 [1, 1, 1]

So final number of steps required is 3.

Q) 1st July 2022 -

Write a function solution that, given a string S consisting of N characters, returns the maximum number of letters 'a' that can be inserted into S (including at the front and end of S) so that the resulting string doesn't contain 3 consecutive letters 'a'. If string S already contains the substring "aaa", then your function should return -1.

Examples:

1. Given S = "aabab", the function should return 3, because a string "aabaabaa" can be made.
2. Given S = "dog", the function should return 8, because a string "aadaaoaagaa" can be made.
3. Given S = "aa", the function should return 0, because no longer string can be made.

4. Given S= "baaaa", the function should return -1, because there is a substring "aaa".

Example 1:

Input: aabab

Output: 3

Explanation: A string aabaabaa can be made

Example 2:

Input: egg

Output: 8

Explanation: A string aaeaagaagaa can be made

Example 3:

Input: aa

Output: 0

Explanation: No longer string can be made.

Example 4:

Input: uaaaa

Output: -1

Explanation: There is a substring aaa

Q) 26th June 2022 -

<https://leetcode.com/problems/minimum-deletions-to-make-character-frequencies-unique/>

Q) 26th June 2022 -

<https://leetcode.com/discuss/interview-question/1412987/Microsoft-or-online-assessment-or-missing-Numbers-dice>

Q) 23rd June 2022 -

Design a directory class which has properties like Subdirectory, Files etc and FileLinkPath.

Write a function Copy Directory that gets the src directory and filePath as input.

Please ensure that the filelinkpath in the copied directory points to the new file path.

Q) 6th June 2022 -

1

Task 2

Programming Language

C++

2

A string S is called a palindrome string if the reverse of that string is the same as the original string. For example, "radar" & "level" are palindrome strings while "microsoft" is not a palindrome string.

A string S is called an extended palindrome string if the string becomes palindrome after chucking it in chunks of length d , where d is either 1 or a prime divisor of $|S|$. For example, "abcxyzabc" is an extended palindrome string because it can be chunked in chunks of length 3 and become a palindrome string "{abc}{xyz}{abc}".



The degree of a string is defined as the minimum possible chunk length that can make the string become an extended palindrome string.

Note that, a palindrome string is an extended palindrome string of degree 1.

1

Task 2

2

Example 2:Input:

S: "abcxyzabc"

Output:

3

Explanation:

By chunking the string into chunks of length 3 (i.e., "{abc}{xyz}{abc}"), the string can be read exactly the same from left to right or from right to left.

Note that 3 is a prime divisor of the length of the string.

**Example 3:**Input:

S: "microsoft"

Output:

-1

Explanation:

All changes saved

1 Task 2 Programming Language C++

2

Write a function:

```
int solution(string &S);
```

that, given a string S ($1 \leq |S| \leq 100,000$), returns the degree of S , or -1 if S is not an extended palindrome string.

Example 1:

Input:
S: "radar"

Output:
1

Explanation:
The string is already a palindrome string which is, by definition, an extended palindrome string of degree 1.

Example 2:
Input:

Q) 31st May 2022 -

You created a set of slides with pages 1,2,3...x and gave for review.

The reviewer re-arranged it as 4,5,1,2,3. You need to find minimum displacement to get back original array.

eg: 4 5 1 2 3

Ans : 2 exp: its either move 1 2 3 to front or 4 5 to back. Minimum us 4,5 which is 2.

Q) 20th May 2022 -

<https://leetcode.com/problems/maximum-number-of-balloons>

Q) 20th May 2022 -

<https://www.chegg.com/homework-help/questions-and-answers/battleships-game-played-rectangular-board-given-representation-board-size-n-height-x-m-width-q97030738>

Q) 10th May 2022 -

<https://leetcode.com/problems/flatten-binary-tree-to-linked-list/solution/>

Q) 10th May 2022 -

Write code to represent company. 1 CEO, managers, employees, etc. A manager has a list of reports(people who work under him). Write a function to return list of all people who work under a particular manager, directly and indirectly.

Q) 10th May 2022 -

<https://leetcode.com/problems/construct-binary-tree-from-preorder-and-inorder-traversal/>

Q) 10th May 2022 -

Design K-V store where if you attempt to retrieve a key that isn't in the data structure, insert it with the value of the average of the 2 closest keys.

ex.

insert(4, 4)

insert (99, 10)

insert(102, 20)

insert(180, 99)

Now the data structure has the above 4 K-V pairs. get(99) = 10, get(102) = 20, etc.

get(100) = 15.

The closest 2 keys to the key of 100 are 99 and 102. Their corresponding values are 10 and 20 respectively. $\text{avg}(10,20) = 15$. Now the data structure contains the K-V pair (100, 15)

Q) 3rd May 2022 -

Given an unsorted integer array find the indices of the two integers such that $\text{Arr}[j] > \text{Arr}[i]$ and $i < j$. Can someone provide a solution for this in java ?

Input : {7,9,5,6,3,2}

Output: 2

Input: {Integer.MIN_VALUE, Integer.MAX_VALUE}

Q) 2nd May 2022 -

<https://leetcode.com/problems/sign-of-the-product-of-an-array/>

Q) 2nd May 2022 -

<https://leetcode.com/discuss/interview-question/1915190/Microsoft-or-OA-or-Redmond-WA-or-Get-Maximum-Distance-of-Same-Elements-in-an-Array>

Q) 2nd May 2022 -

<https://leetcode.com/problems/remove-digit-from-number-to-maximize-result/>

Q) 2nd May 2022 -

Write a function `solution` that, given an integer `N`, returns the maximum possible value obtainable by deleting one '5' digit from the decimal representation of `N`. It is guaranteed that `N` will contain at least one '5' digit.

Examples:

1. Given `N = 15958`, the function should return `1958`.
2. Given `N = -5859`, the function should return `-589`.
3. Given `N = -5000`, the function should return `0`. After deleting the '5', the only digits in the number are zeroes, so its value is `0`.

Assume that:

- `N` is an integer within the range `[-999,995..999,995]`;
- `N` contains at least one '5' digit in its decimal representation;
- `N` consists of at least two digits in its decimal representation.

In your solution, focus on **correctness**. The performance of your solution will not be the focus of the assessment.

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Q) 24th April 2022 -

Given a BST and a rank number. Return the tree node value associated with that rank in $O(\log n)$ TC.

PS: rank is nothing but tree node index value in InOrder traversal array of bst.

Q) 24th April 2022 -

Print the difference string.

Two strings given `S1`, `S2`. Remove all occurrences chars in `S1` which are present in `S2` inplace.

`s1-s2` e.g. "hello world" – "hop" = "ell wrld"

Need in $O(n)$ time complexity without using any library methods in C++.

Q) 23rd April 2022 -

Design in memory data structure to store the data like excel sheet in rows and columns.

Data is generic (can be int, string, bool..) and has properties like font type, size, bold, italics.

User can add more rows and columns at the end

User can also insert rows and columns in between existing rows/columns.

Q) 22rd April 2022 -

Write a function that counts the number of anagrams in a given sorted array of words

input : ["act", "cat", "dog", "god", "tac"]

Output: 2

Q) 16th April 2022 -

Given a string of lowercase English, there may be occurrences of consecutive repeated letters. Remove the minimum number of letters so that there will be no occurrence of 3 or more repeated consecutive letters. Ex.: For input 'xxxtxxx', output: 'xxtxx'. For input 'aaabbbccc', output 'aabbcc'. For input 'aaaaaaaaa', output 'aa'. Input length can be as long as 200,000 characters.

Q) 16th April 2022 -

Given a 2D matrix of size $N \times M$. Where N and M can be at most 500. There will be an assassin (depicted as 'A') somewhere in the matrix, also there will be some obstacles represented by 'X'. Also there will be some guards.

Guards can appear the following way in the matrix: '<' represents a guard that is looking to the left, '>' represents a guard that is looking to the right, '^' looks up, and 'v' is looking down. Their line of sight extends as long as there is an obstacle, edge of the matrix or another guard.

Write a function that calculates whether the assassin can reach the bottom-right corner of the matrix. The assassin can not step in the line of sight of any guard.

Ex.:

For the input

```
. v .  
. . .  
A . .
```

Answer should be false.

For the input

```
A . . .  
. < x x  
. . . .
```

Answer should be false.

For the input

```
. . . <  
A . . ^  
x . . .
```

Answer should be true.

Q) 16th April 2022 -

There are some platforms and there are two frogs sharing the same platform. On their left and on their right, there might be other platforms, some are higher and others as lower.

The two frogs had a fight with each other and then decided to go far apart from each other as much as possible. But they can only change platforms under certain conditions: they can only go to adjacent platforms, and they can only jump to platforms that have the same height or greater height than the platform they currently are.

Write a program that finds out the furthest they can be from each other, considering they start on the platform that will make it possible for them to go the furthest apart. The distance is the difference between the platforms positions + 1.

The input is an array of integers, describing the height of the platforms. Maximum length is 100,000.

For input '[5,4,3,2,1,2,3,3,5]'

The best would be for the frogs to start at the platform of height 1, and then one frog goes as much to the left as possible, and the other one goes to right. They'll be able to reach the ends, since the platforms in those directions are higher or equal. Then the answer is 8 (position of the frog on the right) - 0 (position of the frog on the left) + 1 = 9.

For Input '[1,2,3,4,5,6,5,4,3,2,2,3,4,5,6,7,8]'

The best would be to start at either position 10 or 11. Then one of the frogs can go to the ending right, and the other other can go to the left as far as the position 6. Answer is 17 - 6 + 1 = 12.

Q) 12th April 2022 -

You are given a binary search tree where every node has a character and int.

Level0: G:4(root)

Level1: E:8(root->left) H:5 (root->right)

Level2: D:10(root->left->left) F:12(root->left->right)

How will you insert element into This tree. You have to maintain BST property for Character and min heap property for value.

Q) 12th April 2022 -

You are given a 1-D array { 1,2,3,4,5,6,7,8,9,10}

Take N/2 and arrange elements alternatively in O(n) and O(1)

Output: 1,6,2,7,3,8,4,9,5,10

Q) 20th Mar 2022 -

You are given N building blocks each of which has a height H. weight W. You want to build a tower by stacking up blocks to reach a height of atleast K.

You should consider the strength for each block which indicates the maximum amount of total weight of the blocks that can be stacked above a while building the tower.

Given these constraints: you are required to find whether it is possible to construct a tower with a height of at least K. if it is possible to build the tower with a height of at least then find the maximum safety factor of the tower.

Note:

- You should return -1 if it is impossible to build a tower that satisfies the given constraints.
- The maximum safety factor of the tower is the amount of weight you can add to the top of the tower without exceeding any block's strength.

Input Format:

The first line of input contains a single integer N denoting the number of building blocks.

The next line of input contains a single integer K denoting the required height of the tower.

Each line i of the N subsequent lines (where $0 \leq i < N$) contains an integer describing H_i that denotes the height of block i.

| Sample Input | Sample Output | Explanation |
|----------------------------------|---------------|---|
| 3 5 3 3 2 10 5 | 5 | Place block 1 upon block 3. Max safety: 5 |

| | | |
|---|-----------|---|
| 3 6 4 15 | | |
| 4 10 9 3 5 4 8 3 5 4 1 5 | -1 | It is not possible to arrange them |

| | | |
|----|---|---|
| 4 | 2 | Block 3 in the lowermost layer block in the 2nd lower layer block 2 in the top layer .Max safety =2 |
| 10 | | |
| 9 | | |
| 3 | | |
| 5 | | |
| 4 | | |
| 4 | | |
| 3 | | |
| 5 | | |
| 4 | | |
| 1 | | |
| 5 | | |
| 10 | | |
| 5 | | |

Q) 17th Mar 2022 -

Given an array A of size N. Find the maximum subset-sum of elements that you can make from the given array such that for every two consecutive elements in the array, at least one of the elements is present in our subset.

Input: N = 4, A[] = {1,-1,3,4}

Output: 8

Explanation: We can choose 1st, 3rd and 4th index, you can check that this is maximum possible sum.

Q) 10th Mar 2022 -

Given an n-ary tree with N nodes numbered 0..N-1. Each node is marked as 'a' or 'b'.

Find longest path in a tree with alternating characters.

Input : parent array of size n, string tag

Example 1 :

parent : [-1, 0, 1] , tag ="abb"

```
    0 'a'
     |
     1 'b'
     |
     2 'b'
```

Path length = 2 (0->1)

Example 2:

parent : [-1, 0, 0] , tag ="abb"

```
    0 'a'
   /  \
  1 'b' 2 'b'
```

Path length = 2 (1->0->2)

Q) 23rd Feb 2022 -

Given an integer N, return the maximum possible value obtained by deleting '3' digit from the decimal representation of N. N will have atleast one '3'.Ex:

N = 13938 returns 1938

N = -3839 returns -389

Q) 22nd Feb 2022 -

<https://warosu.org/g/thread/S71955971>

Q) 22nd Feb 2022 -

<https://codility.com/media/train/solution-stone-wall.pdf>

Q) 20th Feb 2022 -

Write a function `solution` that, given an integer `N`, returns the maximum possible value obtainable by deleting one '5' digit from the decimal representation of `N`. It is guaranteed that `N` will contain at least one '5' digit.

Examples:

1. Given `N = 15958`, the function should return `1958`.
2. Given `N = -5859`, the function should return `-589`.
3. Given `N = -5000`, the function should return `0`. After deleting the '5', the only digits in the number are zeroes, so its value is `0`.

Assume that:

- `N` is an integer within the range `[-999,995..999,995]`;
- `N` contains at least one '5' digit in its decimal representation;
- `N` consists of at least two digits in its decimal representation.

Q) 15th Feb 2022 -

Given an array `A` consisting of `N` integers, returns the maximum sum of two numbers whose digits add up to an equal sum.

if there are not two numbers whose digits have an equal sum, the function should return `-1`.

Constraints: `N` is integer within the range `[1, 200000]`

each element of array `A` is an integer within the range `[1, 1000000000]`

Example1:

Input:

`A = [51, 71, 17, 42]`

Output: `93`

Explanation: There are two pairs of numbers whose digits add up to an equal sum: `(51, 42)` and `(17, 71)`, The first pair sums up to `93`

Example2:

Input:

`A = [42, 33, 60]`

Output: `102`

Explanation: The digits of all numbers in `A` add up the same sum, and choosing to add `42` and `60` gives the result `102`

Example3:

Input:

A = [51, 32, 43]

Output: -1

Explanation: All numbers in A have digits that add up to different, unique sums

Q) 15th Feb 2022 -

Given a string *s*, find the minimum number of substrings you can create without having the same letters repeating in each substring.

Example:

world -> 1, as the string has no letters that occur more than once.

dddd -> 4, as you can only create substring of each character.

abba -> 2, as you can make substrings of ab, ba.

cycle -> 2, you can create substrings of (cy, cle) or (c, ycle)

Q) 15th Feb 2022 -

You are given a string *S*, which consists entirely of decimal digits (0-9). Using digits from *S*, create a palindromic number with the largest possible decimal value.

You should use at least one digit and you can reorder the digits.

A palindromic number remains the same when its digits are reversed; for instance, "7", "44" or "83238".

Any palindromic number you create should not, however, have any leading zeros, such as in "0990" or "010".

For example, decimal palindromic numbers that can be created from "8199" are:

"1", "8", "9", "99", "919" and "989".

Among them, "989" has the largest value.

Write a function:

```
class Solution { public String solution(String S); }
```

that, given a string *S* of *N* digits, returns the string representing the palindromic number with the largest value.

Examples:

1. Given "39878", your function should return "898".

2. Given "00900", your function should return "9".

3. Given "0000", your function should return "0".

4. Given "54321", your function should return "5".

Write an efficient algorithm for the following assumptions:

N is an integer within the range [1..100,000];

string *S* consists only of digits (0-9).

Q) 14th Feb 2022 -

1

Task 2

C#

Files

2

In the city there are N districts (numbered from 0 to $N-1$) connected with M streets. The connections are described by two arrays, A and B , both of length M . A pair $(A[K], B[K])$ marks a street between districts $A[K]$ and $B[K]$ (for K from 0 to $M-1$). There are also L hospitals whose locations are described by an array H . The J -th hospital is placed in district $H[J]$ (for J from 0 to $L-1$).

If an ambulance is needed in a district, one is sent from the hospital from which it will arrive in the shortest time. The ambulance arrives by the shortest possible route; passing one street takes it exactly 1 minute.

Potentially, there might be a patient in need in any district of the city. What is the longest time required to reach any possible patient with an ambulance?



All changes saved

1 Task 1 C#

2

A company is planning N projects, numbered from 0 to $N-1$. Completing the K -th project will bring value $V[K]$ to the company. For some projects there may be additional requirements - the L -th requirement states that before starting project $B[L]$, project $A[L]$ should be completed. There are M such requirements.

The company has enough resources for at most two projects to be completed. If two projects are chosen, they will be completed one by one (in sequential order) and the total value they bring to the company is the sum of their individual values. What is the highest value that a valid choice of projects can bring to the company?

Write a function:

```
class Solution { public int  
solution(int[] V, int[] A, int[] B, int M)
```

Files

- task1
 - solution.c
 - test-input

Test Output

- OK
- random
WRONG ANSWER
- take_ne
N <= 50
OK

Detected

1

Task 1

C#

2

write a function:

```
class Solution { public int  
    solution(int[] V, int[] A, int[] B);  
}
```

that, given array V of N integers and two arrays A and B of M integers each, returns the maximum value that the company may gain by completing at most two possible projects.

Examples:

1. Given $V = [-3, 5, 7, 2, 3]$, $A = [3, 1]$ and $B = [2, 4]$, the function should return 9. This can be achieved by completing project 3 (with value 2) first and then project 2 (with value 7).

2. Given $V = [1, 1, 5]$, $A = [0, 1]$ and $B = [2, 2]$, the function should return 2.

3. Given $V = [5, 6, 6, 7, -10]$, $A = [0, 0, 0, 1, 2, 3]$ and $B = [1, 2, 3, 3, 1, 2]$, the function should

All changes saved

Q) 14th Feb 2022 -

A company has a list of expected revenues and payments for the upcoming year in chronological order. The problem is that at some moments in time the sum of previous payments can be larger than the total previous revenue, which would put the company in debt. To avoid this problem the company takes a very simple approach: it reschedules some expenses to the end of the year.

You are given an array of integers, where positive numbers represent revenues and negative numbers represent expenses, all in chronological order. In one move you can relocate any expense (negative number) to the end of the array. What is the minimum number of such relocations to make sure that the company never falls into debt (in other words: you need to ensure that there is no consecutive sequence of elements starting from the beginning of the array, that sums up to a negative number)?

You can assume that the sum of all elements in A is nonnegative.

Write a function:

```
int solution(vector<int> &A);
```

that, given an array A of N integers, returns the minimum number of relocations, so that company never falls into debt.

Examples:

1. Given A = [10, -10, -1, -1, 10], the function should return 1. It is enough to move -10 to the end of the array.
2. Given A = [-1, -1, -1, 1, 1, 1, 1], your function should return 3. The negative elements at the beginning must be moved to the end to avoid the debt at the start of the year.
3. Given A = [5, -2, -3, 1], the answer is 0. The company balance is always nonnegative.

Write an efficient algorithm for the following assumptions:

- N is an integer within the range [1..100,000];
- each element of array A is an integer within the range [-1,000,000,000..1,000,000,000];
- sum of all elements in A is greater than or equal to 0.

Q) 14th Feb 2022 -

Delete all numbers which are smaller than the next item in the array. Array is a dynamic array.

Input: array[]={25,20,15,40,65,55,75,45}

Output: array[]={75,45}

Q) 9th Feb 2022 -

<https://leetcode.com/problems/battleships-in-a-board/>

Q) 9th Feb 2022 -

<https://leetcode.com/problems/gas-station/>

Q) 9th Feb 2022 -

Convert a string to json output, implement a json parser

Q) 9th Feb 2022 -

Design a LRU cache

Q) 9th Feb 2022 -

<https://leetcode.com/problems/string-to-integer-atoi/>

Q) 9th Feb 2022 -

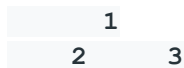
Leader elements in an array

Q) 8th Feb 2022 -

Given two binary trees A and B with numbers convert tree A to tree B by using arithmetic operations (+, -, *, /) on any 2 nodes of A. If not possible return -1.

For example:

A can be



B can be



and B can be obtained from A as



then A==B return 0

Q) 6th Feb 2022 -

The screenshot shows a web browser window with the URL <https://app.codility.com/cj/run/TN9D2G-SAX/>. The page displays a coding task titled "Task 1" in Java 8. The task description is as follows:

A company is planning N projects, numbered from 0 to N-1. Completing the K-th project will bring value V[K] to the company. For some projects there may be additional requirements - the L-th requirement states that before starting project B[L], project A[L] should be completed. There are M such requirements.

The company has enough resources for at most two projects to be completed. If two projects are chosen, they will be completed one by one (in sequential order) and the total value they bring to the company is the sum of their individual values. What is the highest value that a valid choice of projects can bring to the company?

Write a function:

```
class Solution { public int solution(int[] V, int[] A, int[] B); }
```

that, given array V of N integers and two arrays A and B of M integers each, returns the maximum value that the company may gain by completing at most two possible projects.

Examples:

- Given V = [-3, 5, 7, 2, 3], A = [3, 1] and B = [2, 4], the function should return 9. This can be achieved by completing project 3 (with value 2) first and then project 2 (with value 7).
- Given V = [1, 1, 5], A = [0, 1] and B = [2, 2], the function should return 2.
- Given V = [5, 6, 6, 7, -10], A = [0, 0, 0, 1, 2, 3] and B = [1, 2, 3, 3, 1, 2], the function should return 5. The projects that are possible to be completed are 0 and 4. As project 4 would bring negative value to the company, it is optimal to

The code editor shows the following Java solution:

```
1 // you can also use imports, for example:
2 // import java.util.*;
3
4 // you can write to stdout for debugging purposes, e.g.
5 // System.out.println("this is a debug message");
6
7 class Solution {
8     public int solution(int[] V, int[] A, int[] B) {
9         // write your code in Java SE 8
10        // write your code in Java SE 8
11        // Map<Integer,List<Integer>> map=new HashMap<>()
12
13        for(int i=0;i<N;i++){
14            g.add(new ArrayList<>());
15        }
16        for(int i=0;i<A.length;i++){
17            build(g,A[i],B[i]);
18            //build(i,B[i]);
19        }
20        int ans=-1;
21        for (int i = 0; i < H.length; i++) {
22            int temp = H[i];
```

Q) 6th Feb 2022 -

The screenshot shows a coding editor with the following content:

Task 2

In the city there are N districts (numbered from 0 to $N-1$) connected with M streets. The connections are described by two arrays, A and B , both of length M . A pair $(A[K], B[K])$ marks a street between districts $A[K]$ and $B[K]$ (for K from 0 to $M-1$). There are also L hospitals whose locations are described by an array H . The J -th hospital is placed in district $H[J]$ (for J from 0 to $L-1$).

If an ambulance is needed in a district, one is sent from the hospital from which it will arrive in the shortest time. The ambulance arrives by the shortest possible route; passing one street takes it exactly 1 minute.

Potentially, there might be a patient in need in any district of the city. What is the longest time required to reach any possible patient with an ambulance?

Write a function

```
class Solution { public int solution(int N, int[] A, int[] B, int[] H); }
```

that, given an integer N , arrays A and B describing streets in the city and an array H giving locations of hospitals, returns an integer – the longest driving time (in minutes) between a district and its closest hospital. If some district cannot be reached with an ambulance, the function should return -1 .

Examples:

- Given $N = 6, A = [0, 1, 1, 3, 0], B = [1, 2, 3, 4, 5]$ and $H = [2, 4]$, your function should return 3. District number 5 has the longest waiting time. The ambulance will arrive from the hospital in district 2 in three minutes via route $2 \rightarrow 1 \rightarrow 0 \rightarrow 5$.

The city is shown in the diagram below. Districts with hospitals are shaded in gray.

Test Output

```
WRONG ANSWER (got 4 expected 2)
circle (Districts form a circle. N, M <= 10.)
WRONG ANSWER (got 3 expected 2)
not_connected (City consists of disconnected clusters of districts. N, M <= 15.)
WRONG ANSWER (got 7 expected 3)
random (Streets are generated randomly. N, M <= 20.)
WRONG ANSWER (got 9 expected 2)
Detected some errors.
```

Q) 5th Feb 2022 -

Given an array (treat it as a circular array) and a value k

partition it into k sequential parts such that difference between sum of this min part and max part is minimum.

We just have to return that minimum difference.

Example1: $[6,13,10,2]$, $k=2$

Ans:5 ---> Parts are $[13]$ $[6,10,2]$ Note array is circular :P and difference of sum is $18-13=5$

Example2: $[6,13,2,10]$, $k=2$

Ans: 1

Example3: $[6,13,10,2]$ $k=4$

Ans : 11

Q) 1st Feb 2022 -

Given an array of integers and K, find the maximum even using K elements from array.

Q) 1st Feb 2022 -

Given a string consisting of only a and b, what is the minimum number of swaps(replace a with b or b with a) needed such that string doesn't contain 3 consecutive character which are same. e.g aaaba -> 1 (aabba)

Q) 1st Feb 2022 -

Given the positions of houses and routers on a horizontal line, return the minimum radius of the routers such that all houses have wifi.
All routers have the same radius.

Example 1:

Input: houses=[1,2,3], routers=[2]

Output: 1

Example 2:

Input: houses=[1,2,3,4], routers=[1,4]

Output: 1

Example3:

Input: houses=[1,5], routers=[2]

Output: 3