Question 1:

- Problem Statement – Given a string S(input consisting) of '*' and '#'. The length of the string is variable. The task is to find the minimum number of '*' or '#' to make it a valid string. The string is considered valid if the number of '*' and '#' are equal. The '*' and '#' can be at any position in the string.
  Note : The output will be a positive or negative integer based on number of '*' and '#' in the input string.
  - (*>#): positive integer
  - (#>*): negative integer
  - (#=*): 0
  - Example 1:
    Input 1:
    - ###*** -> Value of S
    - Output :
    - 0 → number of * and # are equal

Answer

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Question 2:

A parking lot in a mall has RxC number of parking spaces. Each parking space will either be empty(0) or full(1). The status (0/1) of a parking space is represented as the element of the matrix. The task is to find index of the row(R) in the parking lot that has the most of the parking spaces full(1).

Note :
RxC- Size of the matrix
Elements of the matrix M should be only 0 or 1.

Example 1:
Input :
3 -> Value of R(row)
3 -> value of C(column)
[0 1 0 1 1 0 1 1 1] -> Elements of the array M[R][C] where each element is separated by new line.
Output :
3 -> Row 3 has maximum number of 1's

Example 2:
input :
4 -> Value of R(row)
3 -> Value of C(column)
[0 1 0 1 1 0 1 0 1 1 1 1] -> Elements of the array M[R][C]
Output :
4 -> Row 4 has maximum number of 1's

Answer

Question 3:

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A party has been organised on cruise. The party is organised for a limited time(T). The number of guests entering (E[i]) and leaving (L[i]) the party at every hour is represented as elements of the array. The task is to find the maximum number of guests

Example 1:
Input :

5 -> Value of T

[7,0,5,1,3] -> E[], Element of E[0] to E[N-1], where input each element is separated by new line

[1,2,1,3,4] -> L[], Element of L[0] to L[N-1], while input each element is separate by new line.

Output :
8 -> Maximum number of guests on cruise at an instance.

Answer

Explanation:

1st hour:
Entry : 7 Exit: 1
No. of guests on ship : 6

2nd hour :
Entry : 0 Exit : 2
No. of guests on ship : 6-2=4

Hour 3:
Entry: 5 Exit: 1
No. of guests on ship : 4+5-1=8

Hour 4:
Entry : 1 Exit : 3
No. of guests on ship : 8+1-3=6

Hour 5:
Entry : 3 Exit: 4
No. of guests on ship: 6+3-4=5
Hence, the maximum number of guests within 5 hours is 8.

Example 2:
Input:
4 -> Value of T
[3,5,2,0] -> E[], Element of E[0] to E[N-1], where input each element is separated by new line.
[0,2,4,4] -> L[], Element of L[0] to L[N-1], while input each element in separated by new line

Output:
6
Cruise at an instance

Explanation:
Hour 1:
Entry: 3 Exit: 0
No. of guests on ship: 3

Hour 2:
Entry : 5 Exit : 2
No. of guest on ship: 3+5-2=6

Hour 3:
Entry : 2 Exit: 4
No. of guests on ship: 6+2-4= 4

Hour 4:
Entry: 0 Exit : 4
No. of guests on ship : 4+0-4=0

Hence, the maximum number of guests within 5 hours is 6.
The input format for testing
The candidate has to write the code to accept 3 input.
First input- Accept value for number of T(Positive integer number)
Second input- Accept T number of values, where each value is separated by a new line.
Third input- Accept T number of values, where each value is separated by a new line.
The output format for testing
The output should be a positive integer number or a message as given in the problem statement(Check the output in Example 1 and Example 2)

Constraints:

1<=T<=25

0<= E[i] <=500

Question 4:

At a fun fair, a street vendor is selling different colours of balloons. He sells N number of different colours of balloons (B[]). The task is to find the colour (odd) of the balloon which is present odd number of times in the bunch of balloons.

Note: If there is more than one colour which is odd in number, then the first colour in the array which is present odd number of times is displayed. The colours of the balloons can all be either upper case or lower case in the array. If all the inputs are even in number, display the message "All are even".

Example 1:

7 -> Value of N

[r,g,b,b,g,y,y] -> B[] Elements B[0] to B[N-1], where each input element is separated by new line.

Output :

r -> [r,g,b,b,g,y,y] -> "r" colour balloon is present odd number of times in the bunch.

Explanation:
From the input array above:

r: 1 balloon

g: 2 balloons

b: 2 balloons

y : 2 balloons

Hence , r is only the balloon which is odd in number.

Hence , f is only the balloon which is odd in number.

Example 2:
Input:

10 -> Value of N

[a,b,b,b,c,c,c,a,f,c] -> B[], elements B[0] to B[N-1] where input each element is separated by new line.

Output :
b-> 'b' colour balloon is present odd number of times in the bunch.

Explanation:
From the input array above:

a: 2 balloons

b: 3 balloons

c: 4 balloons

f: 1 balloons

Here, both 'b' and 'f' have odd number of balloons. But 'b' colour balloon occurs first.
Hence , b is the output.

Input Format for testing
The candidate has to write the code to accept: 2 input

First input: Accept value for number of N(Positive integer number).

Second Input : Accept N number of character values (B[]), where each value is separated by a new line.

Output format for testing
The output should be a single literal (Check the output in example 1 and example 2)

Constraints:

3<=N<=50

B[i]={{a-z} or {A-Z}}

Question 5:

You have a long flowerbed in which some of the plots are planted, and some are not. However, flowers cannot be planted in adjacent plots.

Given an integer array flowerbed containing 0's and 1's, where 0 means empty and 1 means not empty, and an integer n, return true if n new flowers can be planted in the flowerbed without violating the no-adjacent-flowers rule and false otherwise.

Example 1:

Input: flowerbed = [1,0,0,0,1], n = 1

Output: true

Example 2:

Input: flowerbed = [1,0,0,0,1], n = 2

Output: false

Constraints:

- 1 <= flowerbed.length <= 2 * 104
- flowerbed[i] is 0 or 1.
- There are no two adjacent flowers in flowerbed.
- 0 <= n <= flowerbed.length

Answer

Question 6:

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1497. Check If Array Pairs Are Divisible by k

Given an array of integers arr of even length n and an integer k.

We want to divide the array into exactly n / 2 pairs such that the sum of each pair is divisible by k.

Return true If you can find a way to do that or false otherwise.

Example 1:

Input: arr = [1,2,3,4,5,10,6,7,8,9], k = 5

Output: true

Explanation: Pairs are (1,9),(2,8),(3,7),(4,6) and (5,10).

Example 2:

Input: arr = [1,2,3,4,5,6], k = 7

Output: true

Explanation: Pairs are (1,6),(2,5) and(3,4).

Example 3:

Input: arr = [1,2,3,4,5,6], k = 10

Output: false

Explanation: You can try all possible pairs to see that there is no way to divide arr into 3 pairs each with sum divisible by 10.

Constraints:

- arr.length == n
- 1 <= n <= 105
- n is even.
- -109 <= arr[i] <= 109
- 1 <= k <= 105

Answer

Question 7:

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Once upon a time, in the magical land of Arrayville, there was a renowned explorer named Alex. Alex was known far and wide for discovering hidden treasures and artifacts buried deep within arrays. One day, a mysterious map came into Alex's possession. The map seemed to point to a valuable gemstone hidden within a peculiar array.

The array was unlike any other - it was an array of integers where each element had a special property. An element at index `i` was said to be "magical" if its value was exactly `i * i`. Alex was convinced that the lost gemstone must be hidden within this magical array.

Your task is to help Alex find the gemstone by implementing a function called `findLostGem (array). This function should take in an array of integers and return the index of the magical element where the gemstone is believed to be hidden.

However, be cautious! The gemstone might not be there at all. In that case, return `-1`.

array = [0, 1, 4, 9, 16, 25, 36]

The gemstone is believed to be hidden at index: 1

Question 7: Solution

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```
bool magical(vector<int> arr)
{
int n=arr.size(); for(int i=0;i<=n;i++)
{ if(arr[i]==i*i)
{ continue;
}
else{
 return false; }
} return true;
}
```

Answer

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Q.8 Perform the function: Int operationchoices(int c, int n, int a, int b). This function considers three positive inputs of a, b and c.

- Execute the function to get:
  (a + b), if c = 1
  (a / b), if c = 4
  (a – b), if c = 2
  (a x b), if c = 3

Input:
a: 12
b: 16
c: 1
Output:
28
Explanation
C = 1, hence the function is (a + b). Hence, the output is 28.

Sample input:
a: 16
b: 20
c: 2
Sample output:
–4

Question 9: Lowest Common Multiple (LCM)

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Problem Constraints

$1 <= A <= 10^9$

$1 <= B <= 10^9$

Input Format

First argument is an integer A.

Second argument is an integer B.

Output Format

Return an integer.

Example Input

Input 1:

```
A = 6 B = 4
```

Input 2:

```
A = 1 B = 11
```

Example Output

Output 1: 12

Output 2: 11

Solution 9 (C++)

```
long long gcd(long long int a, long long int
b)
{
  if (b == 0)
    return a;
  return gcd(b, a % b);
}
// Function to return LCM of two numbers
long long lcm(int a, int b)
{
    return (a / gcd(a, b)) * b;
}
```

Answer

Question 10:

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Problem Description

Given a sentence represented as an array **A** of strings that contains all lowercase alphabets.
Check if it is a **pangram** or not.
A pangram is a unique sentence in which every letter of the lowercase alphabet is used at least once.

Problem Constraints

$1 <= |A| <= 10^5$

$1 <= |A_i| <= 5$

Input Format

Given an array of strings A.

Output Format

Return an integer.

Example Input

Input 1:

```
A = ["the", "quick", "brown", "fox", "jumps", "over", "the", "lazy", "dog"]
```

Input 2:

```
A = ["bit", "scale"]
```

Example Output

Output 1:

```
1
```

Output 2:

```
0
```