



# Techlead Software Engineering Pvt. Ltd.

Programing Test

# Programming Test Questions

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## Instructions

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1. Write a program using c#, c, c++ or JAVA
2. While submitting on google drive link create a folder with your name\_mobilenumber and then add all your work under that folder

Google Drive Link -

<https://drive.google.com/drive/folders/1bjL5pk7jhs5FzWtOq9gZ7WjwC7Xzw8q1?usp=sharing>

3. Please upload your CV in the same folder
  4. All your answers will be auto tested for result generation using multiple test case
  5. Before the code, do mention the thought process behind your logic
  6. Code Cleanliness and Time Complexity/Space Complexity will be judged
  7. Unique and efficient Logic will be given more weightage
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1. Given a square matrix, calculate the absolute difference between the sums of its diagonals. (Marks : 10)

For example, the square matrix is shown below:

```
1 2 3
4 5 6
9 8 9
```

The left-to-right diagonal =  $1+5+9 = 15$ . The right to left diagonal =  $3+5+9 = 17$ . Their absolute difference is  $|15-17| = 2$ .

2. Write a recursive program to print a Fibonacci series. (Marks: 10)
3. Write a program to count frequency of elements from 2-D array and print the output. (Marks: 10)
4. Write a program to find out missing number from two arrays with the following constraints (Marks: 10)
  - a. If a number occurs multiple times in the lists, you must ensure that the frequency of that number in both lists is the same. If that is not the case, then it is also a missing number.
  - b. You have to print all the missing numbers in descending order.
  - c. Print each missing number once, even if it is missing multiple times.
5. Write a program to sort an array in a descending order. (Marks: 10)
6. Write a program to check how many palindrome strings with different lengths exist in a given palindrome string. (Marks: 30)
7. Write a function to find the 3rd largest element in an array (Marks: 30)
8. Write a function to compress a stream of characters (Marks: 30)

AAAAAAABBBBCCCCDDDD11111DDDD333333DDDEEEEEEEEEFF

- A. Currently string takes  $n$  chars to store. Target is to store the using less than  $n$  chars.
- B. Is there any case where instead of compression, expansion will take place?

9. Word Matrix: (Marks: 40)

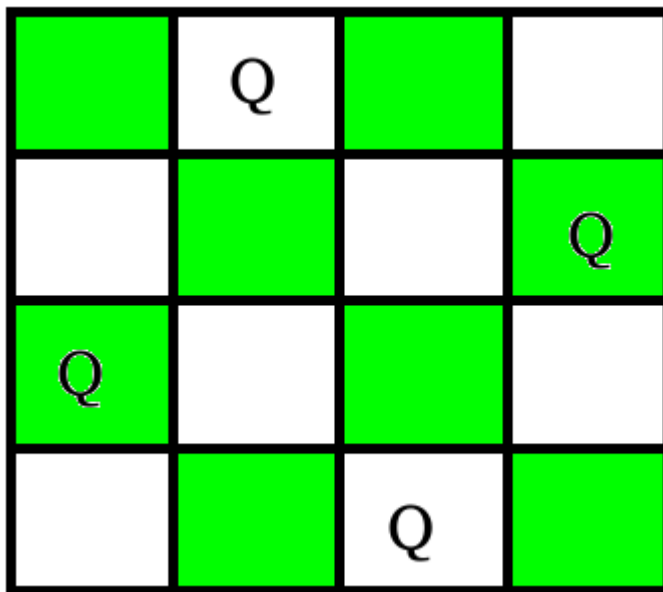
Consider an input list as [AREA, BALL, DEAR, LADY, LEAD, YARD]

Output needs to be list of words (subset of above words) which will create a matrix whose  $n^{\text{th}}$  row and  $n^{\text{th}}$  columns are same. (1<sup>st</sup> row and 1<sup>st</sup> column are same, 2<sup>nd</sup> row and 2<sup>nd</sup> column are same, and so on..)

So output for above list will be

B A L L  
A R E A  
L E A D  
L A D Y

10. Write a code to place n queens on an nxn chessboard such that no two queens attack each other. (Marks:50)



**Input – n**

**Output – all possibilities**

For input  $n = 4$ ,

Output will be [2,4,1,3],[3,1,4,2]

11. Write a code to find a first non-repeated character of a given String?  
(Marks: 10)

Input: ABBBBBBBBBAAAAAEEEEEEF

Output: D