

Giri's Tech Hub Pvt.Ltd, Pune.
Programming (Machine) Test

Batch: April/May/June-2025

Date: 15/09/2025
Time: 08:00 to 11:00 Am

Instructions:

Total:- 10 Marks

1. Solve any 9 questions.
2. Input should be from user.
3. Indentation and comments mandatory.
4. Each program 1 Marks and all comments 1 Marks.
5. Do not use any inbuilt functions.

Q1. Write a java program to print 1 to nth Strong number.

Q2. Write a java program to print this pattern.

```

                *
              * * *
            * * * *
          * * * * *
        * * * * *
      * * * * *
    * * * * *
  * * * * *
* * * * *
  * * * * *
    * * * *
      * * *
        * *
          *
            *
              *
                *
```

Q3. Write a java program to Check If a Number Is a Neon Number or Not Neon number using function recursion.

Q4. Problem:

Given an array of positive integers and a target sum S, find the length of the smallest contiguous subarray whose sum is greater than or equal to S. If no such subarray exists, return 0.

Example:

Input: arr = [2,3,1,2,4,3], S = 7

Output: 2 (subarray [4,3]).

Explanation:

Expand window until the sum \geq S. Then shrink from the left while maintaining the condition to minimize length.

Q5. Write a java program to find the “ Leaders ” in an array.

- A leader in an array is an element which is larger than all the elements to its right side, which is what you can see in the above output.

Input :- arr – { 15 , 18 , 5 , 7 , 9 , 2 }

Output :- 2 , 9 , 18

Q6. Create class name as ArrayOperation with method name as setArray() and create its Two child classes name as CeilFloor , Matrix. We need to inherit the ArrayOperation class in CeilFloor, Matrix and create method. and write the logic.

1. CeilFloor Class :-

Expected Output :

The given array is : 1 3 5 7 8 9
Number: 0 ceiling is: 1 floor is: -1
Number: 1 ceiling is: 1 floor is: 1
Number: 2 ceiling is: 3 floor is: 1
Number: 3 ceiling is: 3 floor is: 3
Number: 4 ceiling is: 5 floor is: 3
Number: 5 ceiling is: 5 floor is: 5
Number: 6 ceiling is: 7 floor is: 5
Number: 7 ceiling is: 7 floor is: 7
Number: 8 ceiling is: 8 floor is: 8
Number: 9 ceiling is: 9 floor is: 9
Number: 10 ceiling is: -1 floor is: 9

2. Matrix class :-

Enter 9 elements for the 3x3 matrix:

10 25 40
50 15 20
30 35 45

Expected Output :

Second max in column 1: 30
Second max in column 2: 25
Second max in column 3: 40

Q7. Problem Statement: Create an abstract class Student with attributes roll number, name, and an array of marks (5 subjects).

Create an interface ResultOperations with methods calculateTotal(), calculatePercentage(), and assignGrade().

- **Implement UGStudent and PGStudent classes with grading rules:**

UG: Pass if percentage $\geq 40\%$

PG: Pass if percentage $\geq 50\%$

Additional Requirements:

- 1. Store details for N students in an array.**
- 2. Display:**
 - List of passed and failed students separately.
 - Top 3 students by percentage.
 - Average marks in each subject.

Explanation: Covers abstraction for common structure, interface for calculations, array processing for N students, sorting for top students, and subject-wise aggregation.

Q8. Write a program that maintains a Vector of city names. Perform the following:

- 1. Insert 5 cities.**
- 2. Remove the city at index 3.**
- 3. Insert a new city at index 1.**
- 4. Display final list.**

Q9. Write a program using ArrayList to store exam marks of students. Take a number from the user and count how many times it appears in the list.

Explanation:

- **Store marks in an ArrayList.**
- **Traverse the list using a loop.**
- **Compare each element with the user input and maintain a count.**
- **Demonstrates searching and frequency counting using ArrayList.**

Q10. Problem: Store integers in a Vector. Remove all odd numbers and print only even numbers.

-----ALL THE BEST-----