Department: CSE

1. Calculate the factorial of a number in C++.
2. Generate a Fibonacci series in C++. Take the range from user.
3. Calculate the simple interest in C++.
4. Check whether a year is leap year or not.
5. Find the roots of a quadratic equation in C++.
6. Find whether a number is Armstrong or not.
7. Find whether a number is perfect or not.
8. Check whether a number is prime or not.
9. Print the prime numbers within a range given by the user.
10. Write a program to calculate length of a string using C++
11. Write a program to compare two strings in C++
12. Write a program to check a string is palindrome or not.
13. Write a program to print initials of a name in C++.

14. Calculate the grade of a student depending on his/her marks :

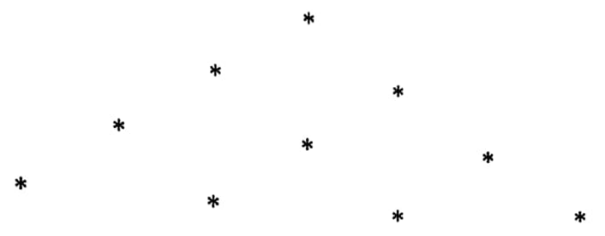
Marks	Grade
<40	F
40-49	D
50-59	C
60-69	B
70-79	A
80-89	E
>90	O

15. Create the following patterns using C++

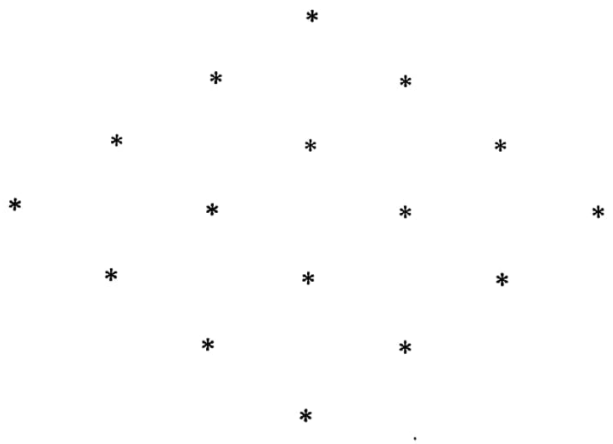
a)

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

b)



c)



16. Exchange the contents of two variable using 'call by reference' in C++ using friend function using a third variable. Do the same without using a third variable.

17. Write a menu driven program to add, subtract and multiply two matrices in C++.

18. Implement the operations of a stack (push, pop, display) using switch case in C++.

19. Sort an integer array in ascending order in C++ using bubble sort.

20. Sort an integer array in ascending order in C++ using insertion sort.

21. Sort an integer array in ascending order in C++ using merge sort.

***Constructor*:**

22. Create a constructor 'Box' in C++ and overload it to calculate the area of a triangle, rectangle and circle.

23. Calculate the area of a triangle and rectangle in C++ where the 'getdata()' method is used to take dimensions from the user. Overload this 'getdata()' method to calculate the area of a circle.

Virtual function, Static Method, Inline function, Friend function:

24. Create a class shape and create a constructor of this class. Use virtual function to calculate the perimeter of a rectangle and circumference of a circle.

25. Design a simple calculator (addition, subtraction, multiplication, division) using static method and switch case in C++.

26. Design a simple calculator (addition, subtraction, multiplication, division) using inline function and switch case in C++.

27. Add two numbers in C++ using friend function.

28. Multiply two numbers in C++ using friend function.

29. Calculate the area of a circle using friend function.

30. Sort an array using bubble sort using friend function.

31. Search an element in the sorted array obtained from (26) using friend function (use binary search).

Operator overloading

32. Overload operator '+' to produce the sum of the coordinates of two location points, (x_1, y_1) and (x_2, y_2) i.e. $(x_1 \square x_2, y_1 \square y_2)$.

33. Overload operator '+' to produce the sum of two complex numbers.

34. Write a program to concatenate two strings using operator overloading.

Inheritance

35. Create a class area and a class cost. Create a subclass of area and cost, refer it as rectangle. Using multiple inheritance calculate the area of a rectangle and then calculate the cost to cover the area by a carpet (covering cost=1000*area).
36. Create a class area with attributes length and breadth. Create a subclass of area rectangle and calculate the area of a rectangle.

37. Create a class area and a class cost. Create a subclass of area and refer it as rectangle. Create a subclass of rectangle and refer it as totalcost. Using multilevel inheritance calculate the total cost to cover the area by a carpet including 18% tax (total cost=covering cost+18% of covering cost).

38. Build a student database (Roll number, Name, department, Marks) in C++.

39. Create a class 'Staff' with attributes name and code. Create two subclasses of 'Staff':

    a. 'Teacher' with attributes subject name, number of publications
    b. 'Typist' having attribute speed and It has two subclasses:
        i. Regular: with attribute salary
        ii. Casual: with attributes daily wages and number of working days

40. Create a class 'Student' with attributes name and roll number. Create two subclasses of 'Student':

    a. 'Test' with attribute marks in six subjects
    b. 'Sports' having attribute marks in sports

    Create a class 'Result' that will inherit the corresponding marks from 'Test' and 'Sports' to calculate the sum of the total marks in six subjects and the sports marks and then divide it by 7 to show the percentage with the total marks (use virtual base class).

Data Science & Data Analytics Laboratory (CS695A/EC695A)
Assignment List

Week	Assignment
Week 1	Assignment on basic data types & mathematical operators in Python.
	Assignment on conditional statement.
	Assignment on loops.
Week 2	Assignment on Strings & related library functions.
	Assignments on Collections (Tuple, Lists, Dictionary, Set)
	Assignment using library functions on List.
Week 3	Assignemnt using scikit-learn library.
	Assignment on Supervised Learning. Building KNN model and making predictions
Week 4	Assignment on Supervised Learning. Evaluating models and parameter tuning
Week 5	1. Write a R program to demonstrate basic mathematical operation 2. Write a R program to find the class of an object using class function 3. Write a R program to find square root, absolute value, logarithm of a number
Week 6	1. Write a R program to create a vector using concatenate function (c()) 2. Write a R program to generate a sequence of numbers with an increment of 0.25 using seq() function 3. Write a R program to generate a sequence of numbers using ':' operator and repeat that sequence for 5 times using rep() function
Week 7	Assignments on building a Linear Regression model in R Use Orange dataset to train the model and Make predictions
Week 8	Assignments on evaluating models in R and plotting regression line
Week 9	Assignment on Matlab neural network toolbox.
Week 10	Implement k-means clustering using Matlab toolbox.