Java Programming (20IS403)

Task-3 Questions

Sl. No.	Programs
1.	Write a Java program to sort the numbers given by user using Bubble Sort.
2.	Write a Java program to find factorial of a number.
3.	Write a Java program to print Floyd's triangle.
4.	Write a Java program for linear search and binary search
5.	Write a Java program to transpose matrix
6.	Write a Java program to get ip address and current date.
7.	Write a Java program to perform garbage collection and to generate random numbers
8.	Write a Java program to multiply two matrices.
9.	The Fibonacci sequence is defined by the following rule. The first 2 values in the sequence are 1, 1. Every subsequent value is the sum of the 2 values preceding it. Write a Java program that uses both recursive and non-recursive functions to print the nth value of the Fibonacci sequence?
10.	Write a Java program that prompts the user for an integer and then prints out all the prime numbers up to that Integer?
11.	Write a Java program that prints all real solutions to the quadratic equation $ax^2 + bx + c = 0$. Read in a, b, c and use the quadratic formula. If the discriminate $b^2 - 4ac$ is negative, display a message stating that there are no real solutions.
12.	Write a Java program that reads on file name from the user, then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes?
13.	Write a java program for producer and consumer problem using Threads.
14.	Define a class **IntArr** which hosts an array of integers. Provide the following methods: 1. A ***default constructor.*** 2. A ***parameterized constructor*** which initializes the array of the object. 3. A method called ***display*** to display the array contents. 4. A method called ***search*** to search for an element in the array. 5. A method called ***compare*** which compares 2 **IntArr** objects for equality.
15.	Define a class called Customer that holds private fields for a customer ID number, name and credit limit. Include appropriate constructors to initialize the instance variables of the Customer Class. Write a main() method that declares an array of 5 Customer objects. Prompt the user for values for each Customer, and display all 5 Customer objects.

16. Create a **Person** class with private instance variables for the person's name and birth date. Add appropriate accessor methods for these variables. Then create a subclass **College Graduate** with private instance variables for the student's GPA and year of graduation and appropriate accessors for these variables. Include appropriate constructors for your classes. Then create a class with **main()** method that demonstrates your classes.

17 Create a Building class and two subclasses, House and School. The Building class contains fields for square footage and stories. The House class contains additional fields for number of bedrooms and baths. The School class contains additional fields for number of classrooms and grade level (for example, elementary or junior high). All the classes contain appropriate get and set methods. Place the Building, House, and School classes in a package named com.course.structure. Create a main method that declares objects of each type and uses the package.

18. Define a class CurrentDate with data members day, month and year. Define a method createDate() to create date object by reading values from keyboard. Throw a user defined exception by name InvalidDayException if the day is invalid and InvalidMonthException if month is found invalid and display current date if the date is valid. Write a test program to illustrate the functionality.

19. Design a class Student with the methods, get Number and put Number to read and display the Roll No. of each student and get Marks() and put Marks() to read and display their marks. Create an interface called Sports with a method put Grade() that will display the grade obtained by a student in Sports. Design a class called Result that will implement the method put Grade() and generate the final result based on the grade in sports and the marks obtained from the superclass Student.

20. Create a class by extending Thread Class to print a multiplication table of a number supplied as parameter. Create another class Tables which will instantiate two objects of the above class to print multiplication table of 5 and 7.

21. Write and execute a java program to create and initialize a matrix of integers. Create n threads(by implementing Runnable interface) where n is equal to the number of rows in the matrix. Each of these threads should compute a distinct row sum. The main thread computes the complete sum by looking into the partial sums given by the threads.

22. Create a Counter class with a private count instance variable and two methods. The first method: synchronized void increment( ) tries to increment count by 1. If count is already at its maximum of 3, then it waits until count is less than 3 before incrementing it. The other method: synchronized void decrement( ) tries to decrement count by 1. If count is already at its minimum of 0, then it waits until count is greater than 0 before decrementing it. Every time either method has to wait, it displays a statement saying why it is waiting. Also, every time an increment or decrement occurs, the counter displays a statement that says what occurred and shows count's new value.

A. Create one thread class whose run( ) method calls the Counter's increment( ) method 20 times. In between each call, it sleeps for a random amount of time between 0 and 500 milliseconds.

B. Create one thread class whose run( ) method calls the Counter's decrement( ) method 20 times. In between each call, it sleeps for a random amount of time between 0 and 500 milliseconds.

C. Write a Counter User class with a main( ) method that creates one Counter and the two threads and starts the threads running.

23. Define a simple generic stack class and show the use of the generic class for two different class types Student and Employee class objects.

24. Define a generic List class to implement a singly linked list and show the use of the generic class for two different class types Integer and Double class objects.

25. Write a program to demonstrate the use of wildcard arguments.

26. Write a program to display the listing of a given directory and its subdirectories using recursion.

27. Write a JavaFX application program to do the following:

a. Display the message "Welcome to JavaFX programming" using Label in the Scene.
b. Set the text color of the Label to Magenta.
c. Set the title of the Stage to "This is the first JavaFX Application".
d. Set the width and height of the Scene to 500 and 200 respectively.
e. Use FlowPane layout and set the hgap and vgap of the FlowPane to desired values.

28. Write a JavaFX program to display a window as shown below. Use TextField for UserName and PasswordField for Password inputs. On click of "Sign in" Button the message "Welcome UserName" should be displayed in a Text Control. Use Grid Layout for the application.

29. Write a JavaFX program that obtains two positive integers passed from the user and displays the numbers and their GCD as the result.

30. Define a class called Employee with the attributes name, empID, designation, basicPay, DA, HRA, PF, LIC, netSalary. DA is 40% of basicPay, HRA is 15% of basicPay, PF is 12% of basicPay. Display all the employee information in a JavaFX application.