2/4 B.Tech SECOND SEMESTER

IT4L1 **JAVA LAB** **Credits: 4**

Lecture: --- **Internal assessment: 25 marks**
Lab:- 6 periods /week **Semester end examination: 50 marks**

Objectives:

- To make the student learn a object oriented way of solving problems.
- To teach the student to write programs in Java to solve the problems

Outcomes :

At the end of this course the student should be able to

- Use basic I/O to communicate with the user to populate variables and control program flow.
- Use arithmetic, logical, relational, and string manipulation expressions to process data.
- Write a complete class definition with in the class definition, write class and instance methods including the constructor and overloaded methods.
- Implement appropriate program design using good programming style.
- Conceptualize, Analyze and write programs to solve more complicated problems using the concepts of Object Oriented and java technology.
- Apply validation techniques to build a reliable solution to a given problem.
- Apply all the programming concepts as and when required in the future application development .

Recommended Systems/Software Requirements:

- Intel based desktop PC with minimum of 166 MHZ or faster processor with atleast 64 MB RAM and 100 MB free disk space
- JDK Kit. Recommended

Exercise 1

a) Write a Java program that prints all real solutions to the quadratic equation ax2 + bx + c = 0. Read in a, b, c and use the quadratic formula. If the discriminant b2 -4ac is negative, display a message stating that there are no real solutions.
b) The Fibonacci sequence is defined by the following rule:
The first two values in the sequence are 1 and 1. Every subsequent value is the sum of the two values preceding it. Write a Java program that uses both recursive and non recursive functions to print the nth value in the Fibonacci sequence.

Exercise 2

a) Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.
b) Write a Java program to multiply two given matrices and find it's transpose (Exercise Find identity Matrix of a given size)

Exercise3

a) Write a Java program that checks whether a given string is a palindrome or not. Ex MALAYALAM is a palindrome.
b) Write a Java program for sorting a given list of names in ascending order.
c) Write a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers (Use StringTokenizer class of java.util)

Exercise 4

a) Write a Java program that reads a 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.
b) Write a Java program that reads a file and displays the file on the screen, with a line number before each line.
c) Write a Java program that displays the number of characters, lines and words in a text file.

Exercise 5

(a) Write a java program to create an abstract class named Shape that contains an empty method named numberOfSides ( ).Provide three classes named Trapezoid, Triangle and Hexagon such that each one of the classes extends the class Shape. Each one of the classes contains only the method numberOfSides ( ) that shows the number of sides in the given geometrical figures.
(b) Write a Java program that demonstrates Packages

Exercise 6

a) Write a Java program demonstrating the life cycle of a thread.
b) Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication

Exercise 7

a) Develop an applet that displays a simple message.
b) Develop an applet that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button named "Compute" is clicked.
c) Write a Java program that allows user to draw lines, rectangles and ovals.

Exercise 8

a) Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -,*, % operations. Add a text field to display the result.

b) Write a Java program for handling mouse events.

Exercise 9

a) Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the textfields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a NumberFormatException. If Num2 were Zero, the program would throw an ArithmeticException Display the exception in a message dialog box.

b) Write a Java program that lets users create Pie charts. Design your own user interface (with Swings & AWT).

Exercise 10

Write a Java program that implements a simple client/server application. The client sends data to a server. The server receives the data, uses it to produce a result, and then sends the result back to the client. The client displays the result on the console. For example The data sent from the client is the radius of a circle, and the result produced by the server is the area of the circle. (Use java.net)

Exercise 11

Create an inheritance hierarchy of Rodent, Mouse, Gerbil, Hamster etc. In the base class provide methods that are common to all Rodents and override these in the derived classes to perform different behaviors, depending on the specific type of Rodent. Create an array of Rodent, fill it with different specific types of Rodents and call your base class methods.

Reference Books:

1. Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI
2. Introduction to Java programming, Sixth edition, Y.Daniel Liang, Pearson Education
3. Big Java, 2nd edition, Cay Horstmann, Wiley Student Edition, Wiley India Private Limited.