Object Oriented Programming through Java

As per Lab Syllabus

Lab No. 1: Basic Programs in Java

Basic programs in Java (Topics: Variables, Datatypes, For loop and while loop)

1. Write a Java program to find the given number is even or not?
2. Write a Java program to find largest among three numbers?
3. Write a Java program to check whether the give number is a palindrome or not?
4. Write a Java program to check whether the given number is prime number or not?
5. Write a Java program to check whether it is a leap year or not?
6. Write a Java program to swap two numbers?
7. Write a Java program to display the fibanocci series?
8. Write a Java program to print the pyramid triangle shape with stars and numbers range upto five lines?
9. Write a Java program to convert temperature in Celsius to Fahrenheit?
10. Write a Java program to perform basic Calculator operations(switch case: +,-,*,/,%)
11. Write a Java program to find the student grade based on the marks using switch case?

Lab No. 2: Programming Assignments on Arrays and Strings

Programming with arrays and strings (Topics: Arrays and Strings)

1. Write a Java program to find vowels and consonants in a given word?
2. Write a Java program to find sum and average of 10 numbers using arrays?
3. Write a Java program to find largest and smallest element of an array?
4. Write a Java program for addition of two matrices?
5. Write a Java program for multiplication of two matrices?

Sorting:

1. Write a Java Program to sort the elements using bubble sort?
2. Write a Java Program to sort the elements using insertion sort?
3. Write a Java Program to sort the elements using selection sort?

Searching:
1. Write a Java Program to search an element using linear search technique?
2. Write a Java Program to search an element using binary search technique?

1. Write a Java program to find frequency of characters of strings?
2. Write a Java program to find number of vowels, consonants, digits and spaces in a given sentence?
3. Write a Java program to remove all the characters except alphabets yin a given sentence (Ex: IDNO)?
4. Write a Java Program to implement all String Class Methods
5. Write a Java Program to implement all String Buffer Class and String Builder Class Methods
6. Write a Java Program to print only alphabets in email id and count the characters in your *rgukt email id*
7. Write a Java Program to print special characters in *email id (rgukt)*

Write a Java Program to print the characters in reverse order in the given string

Lab No. 3: Programming Assignments on Classes and Encapsulation

Problem Set: (Classes, Objects, Constructors and Encapsulation)

1. Create a class named 'Student' with a string variable 'name' and an string variable id_no'. Assign the value of id_no as 'student id' and that of name as "Student name" by creating an object of the class Student.

2. Assign and print the roll number, phone number and address of two students having names "Sam" and "John" respectively by creating two objects of the class 'Student'.

3. Write a program to print the area and perimeter of a triangle having sides of 3, 4 and 5 units by creating a class named 'Triangle' with a function to print the area and perimeter.

4. Write a program to print the area and perimeter of a triangle having sides of 3, 4 and 5 units by creating a class named 'Triangle' with the constructor having the three sides as its parameters.

5. Write a program to print the area of two rectangles having sides (4,5) and (5,8) respectively by creating a class named 'Rectangle' with a function named 'Area' which returns the area. Length and breadth are passed as parameters to its constructor.

6. Print the average of three numbers entered by the user by creating a class named 'Average' having a function to calculate and print the average without creating any object of the Average class.

7. Write a program that would print the information (name, year of joining, salary, address) of three employees by creating a class named 'Employee'. The output should be as follows: Name Year of joining Address Robert 1994 64C- WallsStreat Sam 2000 68D- WallsStreat John 1999 26B- WallsStreat

(Object and Classes)

1. Write a program to implement single inheritance with example (Parent Class-Animal ,Child Class-Dog). [Variables – 2 Legs, tail, Methods -2 Bark(), Eat()]

2. Write a program to implement Multiple Inheritance with example(Base Class-1-Subject1(NT), Base Class-2 Subject2(OOPs), Derived Class Student(Name)-1) and Display the Subject marks (MID and END SEM Marks along with student details Id,Name,Branch

3. Write a program to implement Multilevel Inheritance with example(Base class-Animal, Derived Class – Dog , Derived Class- Babydog) and display the details of (Animal, Dog, Babydog)

4. Write a program to implement Hierarchical Inheritance with example(Base Class-Student, Derived Class – student1, Derived Class-Student2) and display the student1,and student2 details as id,name,class,branch, college

5. Write a program to implement function overloading with change in the number of arguments for display the student details display(Id, Name), display(Id,Name, Branch)

6. Write a program to implement function overloading with change in the typde of arguments for display the student details display(Id, Name,Branch,Total Marks), display(Id,Name, Branch,Percentage)

7. Write a program to implement Overriding with example Base Class(Animal) and Derived Class(Dog) variables and methods should be same display the details

Concepts: Object & Class

1. Write a program to create a class for **student to get and print details of a student (**idno, name, class, branch**).**
2. Write a program to create a class for employee and display Employee details(empid, empname, salary etc)
3. Write a program to create a class for student and display student details (id, name, class,branch) through method (insert, display)

4. Write a program to create a class for an employee and display employee details(empid,empname,salary) through method (insert, display)
5. Write a program to print addition of two numbers using **default constructor and parameterized constructor**?
6. Write a program to print area of triangle using **default and parameterized constructor?**

7. Write a program to differentiate the public and private access specifiers considering data members **x ,y as private** and **a , b as public** and display the output?

8. Write a program to implement the concept of **Encapsulation** by considering data members (a,b) as **private** and access through **public** methods as **set and get** ?

Lab No. 4: Implementing the concepts of Inheritance and Array Objects

1. Write a program to implement S**ingle Inheritance** using class names as student, mystudent and display student details.(id,name,batch,branch,college name etc)
   (Hint: Base Class-1, Derived Class-1)

2. Write a program to implement **Multilevel Inheritance** using class names as Grandparent, Parent and Child; Display the details of the family members?
   (Hint: Base Class -1, Derived / Base Class-1, Derived Class-1)

3. Write a program to implement **Multiple Inheritance** using class names as Father, Mother and Child; Display the details of family members?
   (Hint: Base Class -1, Base Class-2, Derived Class-1)

4. Write a program to implement **Hierarchical Inheritance** using class name Student, student1(name), student2(name), and display the student1 and student2 respectively(id,name,batch,branch,collegename)
   (Hint: Base Class-1, Derived Class-1, Derived Class-2)

5. Write a Program to take subjects (NT,OOPS,EDS) as Class names , attributes as MID-I , MID-II and ENDSEM marks of each subject, use the method name as totalmarks(). Display the student marks subject wise with (id,name, branch, and marks of each subject)
   (Hint: Base Class-1, Base Class-2, Base Class-3, Derived Class-1)

Array of Objects

Lab No. 5: Implementing the OOPs Concepts of Abstract, Interfaces and Polymorphism

Interfaces:

1. Write a Program to implement **Drawable** interface with example like Circle and Rectangle class
2. Write a program of java interface which provides the implementation of Bank interface. (Interface: Bank, class: SBI,PNB,ICICI etc)
3. Write a program to implement multiple inheritance in java by interface

4. Write a Java program to create an interface Shape with the getArea() method. Create three classes Rectangle, Circle, and Triangle that implement the Shape interface. Implement the getArea() method for each of the three classes.

Abstract:

1. Write a Java Program to create an Abstract class with example of Shape , Rectangle and Circle

2. Write a Java Program to implement Abstract Class (Bank) by extending class SBI, PNB to implement Abstract class

3. Write a Java Program to implement Abstract class with Constructor(Bike)

Polymorphism:

1. Explain about Compile Time Polymorphism(Method Overloading) and Runtime Polymorphism(Method Overriding)
2. Explain about Dynamic Method Dispatch with suitable example

Lab No. 6: Programming Assignments on File Handling

1. Write a Java Program to explain the concept of File Reader, File Writer, File Buffer Reader, Buffer Writer with suitable examples.
2. Write a Java Program to Create a **Newfile** in the specified path(Desktop or Documents or Downloads)
3. Write a Java Program to **Get File Information** from the exiting file or create a new file

4. Write a Java Program to write into file using **File Writer**
5. Write a Java Program to read file from existing file
6. Write a Java Program to delete a File from existing File

Lab No. 7: Programming Exercises on Packages and Exception Handling

Packages:

1. Write a Java Program to create a Package
2. Write a Java Program to create a class with reference to package of another class
3. Write a Java Program to access a Package from another package with example

Managing Errors and Exceptions: (Exception Handling)

1. Explain types of Exceptions with examples
2. Write a Program using finally statement in exception
3. Write a program to implement multiple catch statements
4. Write a Program to explain throwing our own exceptions

Lab No. 9: Implementing the concepts of Multi-Threading

Multithreading

1. Implementation of Thread using Inheritance
2. Implementation of Thread using Runnable Interface
3. Life Cycle of a Thread (Program to implement thread class)
4. Thread Synchronization implementation with example
5. Example synchronized method by using anonymous class
6. Implementing thread methods with example

Lab No. 10: Programming Exercises on Event Handling

1. Explain about AWT components and Event Handling (Action Listerner)