OBject oriented programming with java

Lab manual

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**Course Title:** Object Oriented Programming

**Course Code:**

**Course Outcomes:**

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

1. Apply Object Oriented Programming concepts to solve a given problem.
2. Apply design patterns to design a solution for a given problem.
3. Apply inheritance, polymorphism and exception handling mechanism to implement reusable, robust java programs.
4. Implement user interface java programs for a given scenario.

**List of Practical**

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| --- | --- | --- |
| **Sr.#** | **Week** | **Topics** |
| 1 | One | Introduction to IDE-NetBeans, Getting Started with Java |
| 2 | Two | Java Basics (Input/output, variable declaration and initialization, strings and arrays) |
| 3 | Three | Java Basics (Selection Structure and Iterative Structure, functions) |
| 4 | Four | OOP (creating classes, objects, constructors) |
| 5 | Five | access modifiers, inheritance |
| 6 | Six | multiple/multilevel inheritance |
| 7 | Seven | Function overriding |
| 8 | Eight | Polymorphism |
| 9 | Nine | abstract classes and interfaces |
| 10 | Ten | exception handling and Java file handling |

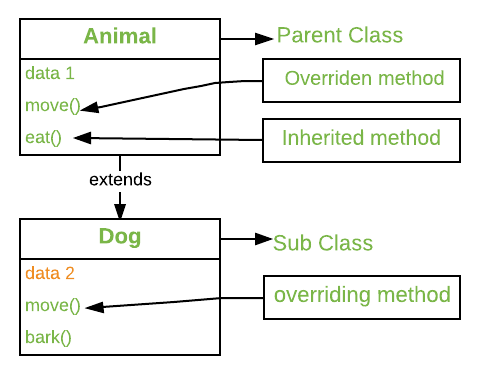
**Introduction to NetBeans and Java**

**LAB-1**

**OOP (Function overriding)**

**LAB-7**

In any object-oriented programming language, declaring a method in sub class which is already present in parent class is known as method overriding. Overriding is done so that a child class can give its own implementation to a method which is already provided by the parent class. In this case the method in parent class is called overridden method and the method in child class is called overriding method. When a method in a subclass has the same name, same parameters or signature and same return type (or sub-type) as a method in its super-class, then the method in the subclass is said to override the method in the super-class.



Method overriding is one of the way by which java achieve Run Time Polymorphism. The version of a method that is executed will be determined by the object that is used to invoke it. If an object of a parent class is used to invoke the method, then the version in the parent class will be executed, but if an object of the subclass is used to invoke the method, then the version in the child class will be executed. In other words, it is the type of the object being referred to (not the type of the reference variable) that determines which version of an overridden method will be executed.

**Example:**

// A Simple Java program to demonstrate

// method overriding in java

// Base Class

class Parent {

    void show()

    {

        System.out.println("Parent's show()");

    }

}

// Inherited class

class Child extends Parent {

    // This method overrides show() of Parent

    @Override

    void show()

    {

        System.out.println("Child's show()");

    }

}

// Driver class

class Main {

    public static void main(String[] args)

    {

        // If a Parent type reference refers

        // to a Parent object, then Parent's

        // show is called

        Parent obj1 = new Parent();

        obj1.show();

        // If a Parent type reference refers

        // to a Child object Child's show()

        // is called. This is called RUN TIME

        // POLYMORPHISM.

        Parent obj2 = new Child();

        obj2.show();

    }

}

**Task-1**

Write a program that have three Classes “One” is base Class and “Two” and “Three” are child of base classes. Three Classes have same functions get() and display() . get() in “One ” Class get two values and display the sum of these values and get() in “Two” Class get three number and display cube of that numbers. And in Class “Three” get four values and display the product of these values. Using “One” Class pointer.

**Task-2**

Create a class called publication that stores the title (a string) and price (type float) of a publication. From this class derive two classes: book, which adds a page count (type int); and tape, which adds a playing time in minutes (type float). Each of the three classes should have a getdata() function to get its data from the user at the keyboard, and a put data() function to display the data.

**Assignment Question**

Write java code by considering a Consider a scenario where Bank is a class that provides functionality to get the rate of interest. However, the rate of interest varies according to banks. For example, SBI, ICICI and AXIS banks could provide 8%, 7%, and 9% rate of interest.

**Hint:** Use function float getRateOfInterest(){return 7;}

