

Don Bosco Institute of Technology, Kurla(W)
Department of Electronics and Tele-Communication Engineering
ECL304 - Skill Lab: C++ and Java Programming
Sem III
2021-22

Lab Number:	8
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Roll No :	8

Title:

1. To perform Multilevel Inheritance in JAVA. Create a Person class representing name, age and address. Inherit person class to employee class with emp ID and salary factor. Inherit the Employee class to programmer class with technical skills and hike attributes. Implement valid methods to input the details from the user in the main method and display for 3 programmers.
2. To perform Hierarchical Inheritance in JAVA. Create an Employee class with attributes EmpID and EmpSalary. Also create necessary methods/constructors to accept these values from the user. Create classes permanentEmployee and TemporaryEmployee which will be derived classes of Employee. Mention hike attribute in these derived classes and calculate the total salary using generate_salary() method for respective types of employees. Objects of the derived classes should be created and salaries for the permanent and temporary employees should be calculated and displayed on the screen.

Learning Objective:

- Students will be able to perform multilevel inheritance using JAVA.
- Students will be able to perform hierarchical inheritance using JAVA

Learning Outcome:

- To understand how to use the private members using friend function and friend class.

Course Outcome:

ECL304.2	Comprehend building blocks of OOPs language, inheritance, package and interfaces.
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Theory:

- Explain in details about various inheritance types supported in JAVA

Inheritance is a mechanism of deriving a new class from an existing class. The existing (old) class is known as base class or super class or parent class. The new class is known as a derived class or sub class or child class. The extends keyword indicates that you are making a

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new class that derives from an existing class. The meaning of "extends" is to increase the functionality

1. Single inheritance: A sub-class is derived from only one super class. It inherits the properties and behaviour of a single-parent class.
2. Multi-level inheritance: A class is derived from a class which is also derived from another class is called multi-level inheritance. In simple words, we can say that a class that has more than one parent class is called multi-level inheritance. The classes must be at different levels. Hence, there exists a single base class and single derived class but multiple intermediate base classes.
3. Hierarchical inheritance: If a number of classes are derived from a single base class, it is hierarchical inheritance.
4. Hybrid inheritance: It consist of more than one. Hybrid inheritance is the combination of two or more types of inheritance.
5. Java does not support multiple inheritances due to ambiguity.

Program 1:

Algorithm:

Step 1: Start

Step 2: Create a Person class representing Name, Age and Address, And take input from user.

Step 3: Inherit person class to employee class, have parameters as employee id, salary factor etc.

Step 4: Inherit the Employee class to programmer class, have parameters as Technical Background , increment, hike etc.

Step 5: Create object of employee, and programmer class and print the data of the programmer/employee.

Step 6: Stop

Code:

```
package inheritance;
import java.util.Scanner;

class person
{
    String name, address;
    int age;
    Scanner in = new Scanner(System.in);
    void display()
```

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```
{
    System.out.println("***Details of the Programmer***");
    System.out.println("\nEnter your name :");
    name=in.next();
    System.out.println("Enter your age :");
    age=in.nextInt();
    System.out.println("Enter your address :");
    address=in.next();
}
}

class employee extends person
{
    int empid;
    float salary=15000 ;
    Scanner in= new Scanner(System.in);
    void getdata()
    {
        System.out.println("Employee ID is :");
        empid=in.nextInt();
    }

    void getsalary()
    {
        System.out.println("The Base Salary is : " +salary);
    }
}

class programmer extends employee
{
    Scanner in = new Scanner(System.in);
    String Profession;
    double hike=0.5 ;
    void printdata()
    {
        System.out.println("Technical Background : ");
        Profession=in.next();
    }

    void hikesalary()
    {
        super.getsalary();
        System.out.println("\nSalary after increment is : " +(salary+(salary*hike)) );
    }
}

class Multilevel_inheintence
{
```

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```
public static void main(String[] args)
{
    // TODO Auto-generated method stub
    employee emp = new employee();
    programmer p = new programmer();
    emp.display();
    emp.getdata();
    p.printdata();
    p.hikesalary();
}
```

Input Given:

Enter your name: Deep

Enter your age: 19

Enter your address: Bhandup

Employee ID is: 8

Technical Background: EXTC

Output:

```
***Details of the Programmer***

Enter your name :Deep
Enter your age :
19
Enter your address :Bhandup
Employee ID is :
8
Technical Background :
EXTC
The Base Salary is :15000.0
Salary after increment is : 22500.0
```

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Program 2:

Algorithm:

Step 1: Start

Step 2: Create class employee with attributes EmpID, using method of Hierarchical Inheritance.

Step 3: Create classes permanentEmployee and TemporaryEmployee which will be derived classes of Employee.

Step 4: Create hike attribute in these derived classes and calculate the total salary using incrementsalary() method for respective types of employees.

Step 5: Create object of the derived classes and print the output for salaries of both types of employees.

Step 6: Stop

Code:

```
pacakge inheritance;
class employee
{
    float salary = 40000;
    void display()
    {
        System.out.println("\n\nThe Basic Salary is:" + salary);
    }
}

class Permanentemp extends employee
{
    double hike = 0.8;

    void incrementsalary()
    {
        super.display();
        System.out.println("\nSalary of Permanent employee after increment is:" +
(salary+(salary *hike)) );
    }
}

class Temporaryemp extends employee
{
    double hike = 0.25;

    void incrementsalary()
```

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```
        {
            System.out.println("");
            System.out.println("\nSalary of Temporary employee after increment is:" +
(salary+(salary *hike)) );
        }
    }

class Hierarchical_inheritance
{
    public static void main(String args[])
    {
        Permanentemp per = new Permanentemp();
        Temporaryemp temp = new Temporaryemp();
        per.incrementsalary();
        temp.incrementsalary();
    }
}
```

Input Given:

The Basic Salary is: 40,000

Output:

```
The Basic Salary is:40000.0
Salary of Permanent employee after increment is:72000.0
Salary of Temporary employee after increment is:50000.0
|
```