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**
Student Name:	**Sakshi Vadiraj Kaveri**
Roll No :	**33**

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 permenantEmployee 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.

Theory:

- Explain in details about various inheritance types supported in JAVA

The types of inheritance supported in java are single, multilevel and hierarchical inheritance.

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Single inheritance: When a single class is inherited by another class it is known as single inheritance. Single inheritance consists of a parent class and a child class. The syntax for single inheritance is:-

*class derived class_name **extends** base class_name.*

for eg:-

```
class A {}

class B extends A{}
```

Multilevel inheritance: When a single class is inherited by a parent class and then a new class is inherited by the derived class is known as multilevel inheritance. In simple words a child class derived from a parent class and then a new class is derived from the child class.

The syntax for multilevel inheritance is :-

```
class A{}

 class B extends A{}

class C extends B{}
```

Hierarchical inheritance: A class that is inherited by many subclasses is known as hierarchical inheritance in java. In other words, when one class is extended by many subclasses, it is known as hierarchical inheritance.

```
Syntax:

class A{}

class B extends A{}

class C extends A{}
```

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ALGORITHM:

1) Create class person , declare attributes name, age, address.
2) Create a function printData() and print the input taken from user.
3) Inherit class employee from person, decare variables EmpID, salary. Print the data in display() function.
4) Inherit class programmer from employee, declare variables hike and tech
5) In main function create object of the derived class programmer and display the output.

PROGRAM:

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

class person{
	Scanner in= new Scanner(System.in);
	String name;
	int age;
	String address;
	void printData() {
		System.out.println("Enter the name,age and address of the person ");
		name=in.next();
		age=in.nextInt();
		address=in.next();
	}
}
class employee1 extends person{
	Scanner in= new Scanner(System.in);
	int EmpID;
	float salary;
	void display() {
		System.out.println("Enter the Employee ID and salary ");
		EmpID=in.nextInt();
		salary=in.nextFloat();
	}
}
class programmer extends employee1{
	double hike=0.1;
```

```
	String tech="Java, Python,C";
	void calc() {
		super.printData();
		super.display();
		System.out.println("The name of the person is "+name);
		System.out.println("The age of the person is "+age);
		System.out.println("The address of the person is "+address);
		System.out.println("The employee id of the person is "+EmpID);
		System.out.println("The salary of the person is "+salary);
		System.out.println("The technical skills are: "+tech);
		System.out.println("The total salary of the employee is
"+(salary+(salary*hike)));
	}
}


public class Lab8_part2 {

	public static void main(String[] args) {
		programmer p1=new programmer();
		p1.calc();
		programmer p2=new programmer();
		p2.calc();
		programmer p3=new programmer();
		p3.calc();

		}



	}
```

INPUT GIVEN:

Person 1:

Name- Rahul, age- 12, address- Hawai, employee id= 12, salary= 50000

Person 2:

Name- shankar, age= 30, address- Mumbai, employee id= 10, salary= 55000

Person 3:

Name- amanpreet, age- 27, address- thane, employee id= 50, salary= 60000

OUTPUT SCREENSHOT:

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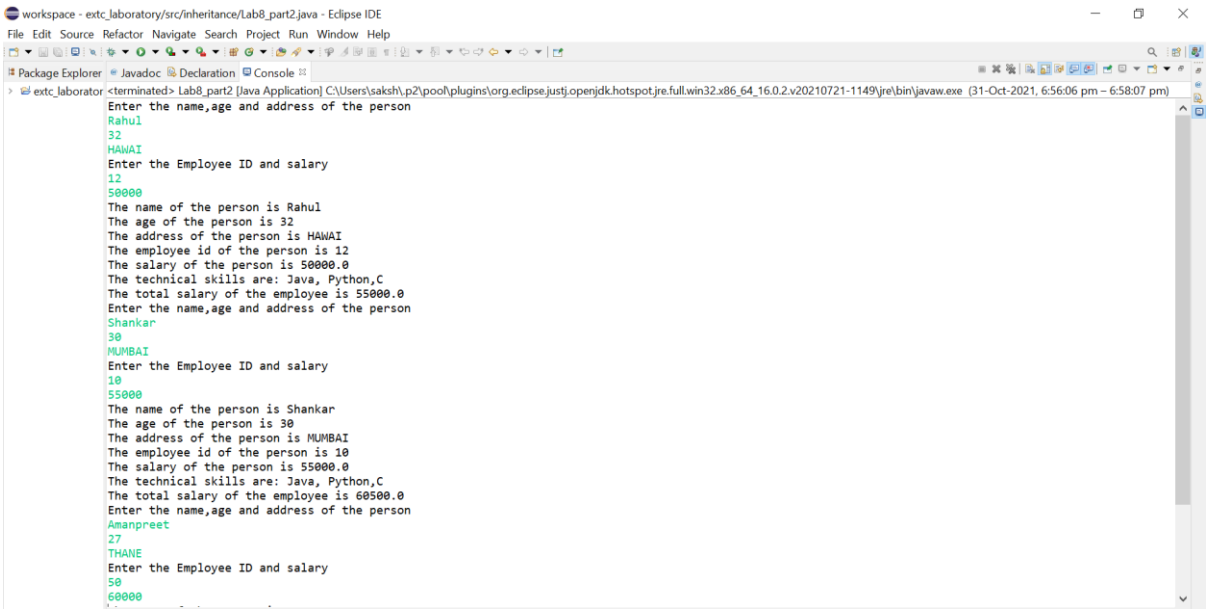

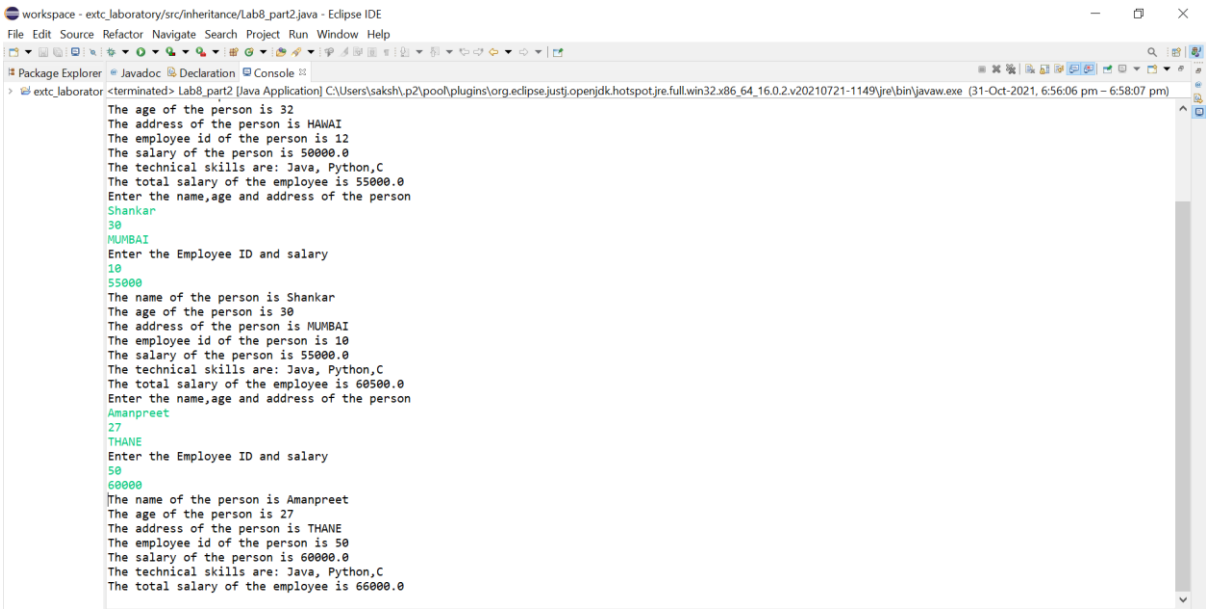

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ALGORITHM:

1) Create class employee, declare int EmpID, int EmpSalary.
2) Derive PermanentEmployee and TemporaryEmployee classes from class Employee declare float hike=0.1*EmpSalary for permanent employee and float hike= 0.05*EmpSalary for temporrary employee.
3) Create objects of the derived classes and display the output.

PROGRAM:

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

class Employee{
	Scanner in=new Scanner(System.in);
	int empID;
	float Empsalary;
	void display() {
		System.out.println("Enter the ID and salary of the employee ");
		empID=in.nextInt();
		Empsalary=in.nextFloat();
	}
}
class PermanentEmployee extends Employee{
	double hike= 0.12;
	void generate_salary() {
		super.display();
		System.out.println("The total salary of the employee is
"+(Empsalary+(Empsalary*hike)));
	}
}
class TemporaryEmployee extends Employee{
	double hike= 0.08;
	void generate_salary() {
		super.display();
		System.out.println("The total salary of the employee is
"+(Empsalary+(Empsalary*hike)));
	}
}


public class Lab8 {

	public static void main(String[] args) {
		PermanentEmployee p= new PermanentEmployee();
		p.generate_salary();
		TemporaryEmployee temp= new TemporaryEmployee();
		temp.generate_salary();
		//System.out.println("Hello world");
```

```
    }


    }
```

INPUT GIVEN:

```
Id of the employee 12 and salary= 40000
Id of the employee 45 and salary= 35000
```

OUTPUT SCREENSHOT: