Experiment 6

Inheritance

Aim: Write two Java classes Employee and Engineer. Engineer should inherit from Employee class. Employee class to have two methods display() and calcSalary(). Write a program to display the engineer salary and to display from Employee class using a single object instantiation (i.e., only one object creation is allowed).

i) display() only prints the name of the class and does not return any value. Ex. " Name of class is Employee."

ii) calcSalary() in Employee displays "Salary of employee is 10000" and calcSalary() in Engineer displays"Salary of employee is 20000."

Concepts Used: Inheritance, Class, Method Overriding

Algorithm:

Class Employee
     algorithm details
         Step 1: Start
         Step 2: print "The name of the class is Employee"
         Step 3: Stop
     algorithm calcSalary
         Step 1: Start
         Step 2: print "The salary of employee is 10000"
         Step 3: Stop
Class Engineer inherits from Class Employee
     algorithm calcSalary
         Step 1: Start
         Step 2: print "The salary of employee is 20000"
         Step 3: Stop

Result: The program was successfully compiled and the required output was obtained.

Program:

```java
/* Engineer.java
 *
 * Done By: Rohit Karunakaran
 * */

class Employee
{
    void display()
    {
        System.out.println("Name of the class is Employee");
    }
    void calcSalary()
    {
        System.out.println("Salary of employee is 10000");
    }
}

public class Engineer extends Employee
{
    void calcSalary()
    {
        System.out.println("Salary of employee is 20000");
    }

    public static void main(String[] args)
    {
        Engineer e1 = new Engineer();
        e1.display();
        e1.calcSalary();
    }
}
```

Sample Output:
```
Name of the class is Employee
Salary of employee is 20000
```

Experiment 7

Implementation of Abstract Class

Aim: Write a java program to create an abstract class named Shape that contains an empty method named numberOfSides( ).Provide three classes named Rectangle, 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 structures.

Concepts Used: Class, Abstract Class, Inheritance

Algorithms:

    Abstract Class Shape
        Abstract method numberOfSides

    Class Rectangle inherits Shape
        numberOfSides()
            Step 1: Start
            Step 2: Print "The number of sides in a rectangle is 4"
            Step 3: Stop

    Class Triangle inherits Shape
        numberOfSides()
            Step 1: Start
            Step 2: Print "The number of sides in a rectangle is 3"
            Step 3: Stop

    Class Hexagon inherits Shape
        numberOfSides()
            Step 1: Start
            Step 2: Print "The number of sides in a rectangle is 6"
            Step 3: Stop

Result: The Program was successfully compiled and the required output was obtained.

Program:

```java
/* Program2.java
 *
 *  Done By: Rohit Karunakaran
 *
 *  Abstract classes:
 *       Shape
 *  Classes:
 *       Rectangle : extends Shape
 *       Triangle : extends Shape
 *       Hexagon : extends Shape
 * */


abstract class Shape
{
    abstract void numberOfSides();
}

class Rectangle extends Shape
{
    void numberOfSides()
    {
        System.out.println("Number of sides in Rectangle= 4");
    }
}

class Triangle extends Shape
{
    void numberOfSides()
    {
        System.out.println("Number of sides in Triangle= 3");
    }
}

class Hexagon extends Shape
{
    void numberOfSides()
    {
        System.out.println("Number of sides in Hexagon = 6");
    }
}

public class Program2
```

```
{
    public static void main(String args[])
    {
        Rectangle r1 = new Rectangle();
        Triangle t1 = new Triangle();
        Hexagon h1 = new Hexagon();

        r1.numberOfSides();
        t1.numberOfSides();
        h1.numberOfSides();
    }
}
```

Sample Output:

```
Number of sides in Rectangle= 4
Number of sides in Triangle= 3
Number of sides in Hexagon = 6
```