CHAROTAR UNIVERSITY OF SCIENCE & TECHNOLOGY

DEVANG PATEL INSTITUTE OF ADVANCE TECHNOLOGY & RESEARCH

Department of Computer Science & Engineering

Subject Name: Java Programming
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PART – 4 (Inheritance, Interface, Package)

NO.	Aim of the Practical

17.	Create a class with a method that prints "This is parent class" and its subclass with another method that prints "This is child class". Now, create an object for each of the class and call 1 - method of parent class by object of parent.
	
	PROGRAM CODE:
	import java.util.Scanner;
	class parent
	{
	void parent()
	{
	System.out.println("This is Parent Class.");
	}
	}
	class child extends parent
	{
	void child()
	{
	System.out.println("This is Child Class.");
	}
	}
	class pra17

```
{
public static void main(String args[])
{
parent p = new parent();
p.parent();
System.out.println("23DCS030_Shreya Garasia");
}
}
```

OUTPUT:

```
This is Parent Class.
23DCS030_Shreya Garasia
```

CONCLUSION:

In This Practical We Learnt About command-line arguments With This Convert Pound to Rupess.

18. Create a class named 'Member' having the following members: Data members
1 - Name
2 - Age
3 - Phone number
4 - Address
5 – Salary
It also has a method named 'printSalary' which prints the salary of the members. Two classes 'Employee' and 'Manager' inherits the 'Member' class. The 'Employee' and 'Manager' classes have data members 'specialization' and 'department' respectively. Now, assign name, age, phone number, address and salary to an employee and a manager by making an object of both of these classes and print the same.

PROGRAM CODE :

```
import java.util.Scanner;
//PRATICAL 18
class Member
 {
   String name;
   int age;
```

```
    long phoneNo;
    String address;
    double salary;

    void printSalary()
{
        System.out.println("Salary: " + salary);
 }
}
class Employee extends Member
{
    String specialization;
}
class Manager extends Member
{
    String department;
}


public class pra18
{
    public static void main(String[] args)
{
        Scanner scanner = new Scanner(System.in);

        // Create an Employee object
        Employee emp = new Employee();
        System.out.println("Enter the name of the employee:");
        emp.name = scanner.nextLine();
        System.out.println("Enter the age of the employee:");
        emp.age = scanner.nextInt();
        System.out.println("Enter the phone number of the employee:");
        emp.phoneNo = scanner.nextLong();
        scanner.nextLine();
        System.out.println("Enter the address of the employee:");
        emp.address = scanner.nextLine();
        System.out.println("Enter the salary of the employee:");
        emp.salary = scanner.nextDouble();
```

```
scanner.nextLine();
System.out.println("Enter the specialization of the employee:");
emp.specialization = scanner.nextLine();

// Create a Manager object
Manager mag = new Manager ();
System.out.println("Enter the name of the manager:");
mag.name = scanner. nextLine ();
System.out.println("Enter the age of the manager:");
mag.age = scanner. nextInt ();
System.out.println("Enter the phone number of the manager:");
mag.phoneNo = scanner. nextLong ();
scanner. nextLine ();
System.out.println("Enter the address of the manager:");
mag. address = scanner. nextLine ();
System.out.println("Enter the salary of the manager:");
mag. salary = scanner. next Double ();
scanner. nextLine ();
System.out.println("Enter the department of the manager:");
mag.department = scanner. nextLine ();

// details of Employee
System.out.println("\nEmployee Details:");
System.out.println("Name: " + emp.name);
System.out.println("Age: " + emp.age);
System.out.println("Phone Number: " + emp.phoneNo);
System.out.println("Address: " + emp.address);
emp. printSalary ();
System.out.println("Specialization: " + emp. specialization);

//  details of Manager
System.out.println("\n Manager Details:");
System.out.println("Name: " + mag.name);
System.out.println("Age: " + mag.age);
System.out.println("Phone Number: " + mag. phoneNo);
System.out.println("Address: " + mag.  address);
mag. printSalary ();
System.out.println("Department: " + mag. department);
```

```
        System.out.println("23DCS030_Shreya Garasia");
    }
}
```

OUTPUT:

```
Employee Details:
Name: Riya
Age: 21
Phone Number: 1928736545
Address: Surat
Salary: 47000.0
Specialization: AIML

Manager Details:
Name: Tisha
Age: 23
Phone Number: 9876342254
Address: Navsari
Salary: 52000.0
Department: Software
23DCS030_Shreya Garasia
```

CONCLUSION:

In This Practical We Perform a set and a get method for each instance variable to display each Employee's yearly salary .

19. Create a class named 'Rectangle' with two data members 'length' and 'breadth' and two methods to print the area and perimeter of the rectangle respectively. Its constructor having parameters for length and breadth is used to initialize length and breadth of the rectangle. Let class 'Square' inherit the 'Rectangle' class with its constructor having a parameter for its side (suppose s) calling the constructor of its parent class as 'super(s,s)'. Print the area and perimeter of a rectangle and a square. Also use array of objects.

PROGRAM CODE:

```
import java.util.Scanner;

// PRACTICAL14
class Date
{
   int day;
```

```
    int month;
    int year;

    public Date(int day, int month, int year)
{
        this.day = day;
        this.month = month;
        this.year = year;
 }

    public void setDay(int day)
{
        this.day = day;
 }

    public void setMonth(int month)
{
        this.month = month;
 }

    public void setYear(int year)
{
        this.year = year;
 }

    public int getDay()
{
        return day;
 }

    public int getMonth()
{
        return month;
 }

    public int getYear()
 {
        return year;
```

```
  }

   public void displayDate()
{
      System.out.println(day + "/" + month + "/" + year);
  }
}

public class DateTest
{
   public static void main(String[] args)
{
      Scanner s = new Scanner(System.in);

      System.out.println("Enter the day:");
      int day = s.nextInt();

      System.out.println("Enter the month:");
      int month = s.nextInt();

      System.out.println("Enter the year:");
      int year = s.nextInt();

      Date date = new Date(day, month, year);

      date.displayDate();
      System.out.println("23DCS030_Shreya Garasia");

   }
}
```

OUTPUT:

```
Enter the day:
11
Enter the month:
11
Enter the year:
24
11/11/24
23DCS030_Shreya Garasia
```

CONCLUSION:

In This Practical we Print date with the order of day, month and year.

20. Create a class named 'Shape' with a method to print "This is This is shape". Then create two other classes named 'Rectangle', 'Circle' inheriting the Shape class, both having a method to print "This is rectangular shape" and "This is circular shape" respectively. Create a subclass 'Square' of 'Rectangle' having a method to print "Square is a rectangle". Now call the method of 'Shape' and 'Rectangle' class by the object of 'Square' class.

PROGRAM CODE :

```
import java.util.Scanner;
//PRATICAL 20
class Shape
{
void method()
{
System.out.println("This Is Shape :");
}
}
class Rectangle extends Shape
{
void method1()
{
System.out.println("This Is The Rectangle Shape");
}
```

```
}
class Square extends Rectangle
{
void method3()
{
System.out.println("Square is A Rectangle");
}
}
class Circle extends Shape
{
void method2()
{
System.out.println("This Is The Circle Shape");
}
}
public class pra20
{
public static void main(String[ ] args)
{
   Square  s = new Square();
   s.method1();
   s.method3();
System.out.println(" ");
System.out.println("23DCS030_Shreya Garasia");
}
}
```

OUTPUT:

```
This Is The Rectangle Shape
Square is A Rectangle
23DCS030_Shreya Garasia
```

CONCLUSION:

In This Practical We Find Area Of Rectangle.

21. Create a class 'Degree' having a method 'getDegree' that prints "I got a degree". It has two subclasses namely 'Undergraduate' and 'Postgraduate' each having a method with the same name that prints "I am an Undergraduate" and "I am a Postgraduate" respectively. Call the method by creating an object of each of the three classes.

PROGRAM CODE:

```
//PRATICAL 21
import java.util.Scanner;
import java.util.*;
class Degree
{
void getDegree()
{
System.out.println("I Got A Degree");
}
}
class Undergraduate extends Degree
{
void getDegree()
{
System.out.println("I Am An Undergraduate");
}
}
class Postgraduate extends Degree
{
void getDegree()
{
System.out.println("I Am A Postgraduate");
}
}

public class pra21
{
public static void main(String args[])
{
Degree d = new Degree();
Undergraduate ud = new Undergraduate();
Postgraduate pd = new Postgraduate();
```

```
ud.getDegree();
d.getDegree();
pd.getDegree();
System.out.println("23DCS030_Shreya Garasia");
}
}
```

OUTPUT:

```
I Got A Degree.
I Am An Undergraduate.
I Am A Postgraduate.
23DCS030_Shreya Garasia
```

CONCLUSION:

In This Practical We performed the creating objects of each methods.

22. Write a java that implements an interface AdvancedArithmetic which contains a method signature int divisor_sum(int n). You need to write a class calledMyCalculator which implements the interface. divisorSum function just takes an integer as input and return the sum of all its divisors. For example, divisors of 6 are 1, 2, 3 and 6, so divisor_sum should return 12. The value of n will be at most 1000.

PROGRAM CODE:

```
// PRACTICAL 22
import java.util.Scanner;

interface AdvancedArithmetic
{
 int divisor_sum(int n);
}
class MyCalculator implements AdvancedArithmetic
{
public int divisor_sum(int n)
{
int sum = 0;

     for (int i = 1; i<=n ; i++)
```

```
{
   if(n % i == 0)
{
 sum += i;
}
}
return sum;
}
}

class pra22
{
public static void main(String[] args)
{
Scanner sc = new Scanner(System.in);

System.out.println("Enter A Divisor Integer :" );
int n = sc.nextInt();

MyCalculator mc= new MyCalculator();
int sum = mc.divisor_sum(n);

System.out.println("Sum of  Divisors of " + n + " is " + sum);
System.out.println("23DCS030_Shreya Garasia");
}
}
```

OUTPUT:

```
Enter A Divisor Integer :
6
Sum of  Divisors of 6 is 12
23DCS030_Shreya Garasia
```

CONCLUSION:

In This Practical We Performed Interface To Print The Divisor.

23. Assume you want to capture shapes, which can be either circles (with a radiusand a color) or rectangles (with a length, width, and color). You also want to be able to create signs (to post in the campus center, for example), each of which has a shape (for the background of the sign) and the text (a String) to put on the sign. Create classes and interfaces for circles, rectangles, shapes, and signs. Write a program that illustrates the significance of interface default method.

PROGRAM CODE:

```
import java.util.Scanner;

interface Shape
{
   String getColor();

   default void display()
{
      System.out.println("This is a shape.");
   }
}

class Circle implements Shape
{
   private double radius;
   private String color;

   public Circle(double radius, String color)
{
      this.radius = radius;
      this.color = color;
   }

   public double getRadius()
{
      return radius;
   }
   public String getColor()
{
```

```
        return color;
    }
    public void display()
{
        System.out.println("This is a circle.");
        System.out.println("Radius: " + radius);
        System.out.println("Color: " + color);
    }
}
class Rectangle implements Shape
{
    private double length;
    private double width;
    private String color;

    public Rectangle(double length, double width, String color)
{
        this.length = length;
        this.width = width;
        this.color = color;
    }

    public double getLength()
{
        return length;
    }

    public double getWidth()
{
        return width;
    }
    public String getColor()
{
        return color;
    }
    public void display()
{
        System.out.println("This is a rectangle.");
```

```
        System.out.println("Length: " + length);
        System.out.println("Width: " + width);
        System.out.println("Color: " + color);
    }
}

class Sign
{
    private Shape shape;
    private String text;

    public Sign(Shape shape, String text)
{
        this.shape = shape;
        this.text = text;
    }

    public void displaySign()
{
        shape.display();
        System.out.println("Sign text: " + text);
    }
}

class pra23
 {
    public static void main(String[] args)
{
        Scanner scanner = new Scanner(System.in);

        System.out.println("Enter shape type (1 for circle, 2 for rectangle): ");
        int shapeType = scanner.nextInt();
        scanner.nextLine();

        Shape shape = null;
        switch (shapeType)
{
            case 1:
```

```
            System.out.println("Enter radius: ");
            double radius = scanner.nextDouble();
            scanner.nextLine();
            System.out.println("Enter color: ");
            String color = scanner.nextLine();
            shape = new Circle(radius, color);
            break;
        case 2:
            System.out.println("Enter length: ");
            double length = scanner.nextDouble();
            scanner.nextLine();
           System.out.println("Enter width: ");
            double width = scanner.nextDouble();
            scanner.nextLine();
            System.out.println("Enter color: ");
            String rectColor = scanner.nextLine();
            shape = new Rectangle(length, width, rectColor);
            break;
        default:
            System.out.println("Invalid shape type.");
      }

      if (shape != null)
{
          System.out.println("Enter sign text: ");
          String text = scanner.nextLine();
          Sign sign = new Sign(shape, text);
          sign.displaySign();
      }

     System.out.println("23DCS030_Shreya Garasia");
   }
}
```

OUTPUT:

```
This is a circle.
Radius: 2.0
Color: Blue
Sign text: This is circle
```

```
This is a rectangle.
Length: 4.0
Width: 2.0
Color: Green
Sign text: This is rectangle
23DCS030_Shreya Garasia
```

```
Enter shape type (1 for circle, 2 for rectangle):
3
Invalid shape type.
23DCS030_Shreya Garasia
```

CONCLUSION:

In This Practical We make classes and interfaces with we get all details we want to get.