1: Solve assignment (to understand abstraction)

1. Create abstract class Shape --state : x,y

Abstract Method --public double area();

public String toString() : to ret x & y

Why will area() be abstract in Shape class ?????????

2. Circle -- x,y,radius

Concrete overriding Method --public double area() : ret area of circle

public String toString() : ret x, y & radius

3. Rectangle -- x,y,w,h

Concrete overriding Method --public double area() : ret area of rectangle

public String toString() : ret x, y , width & height

4. Square-- x,y,side

Concrete overriding Method --public double area() : ret area of square

public String toString() : ret x, y , side

5. Create a ShapeFactory class To Test

Create Menu Driven Program for Adding Shape in arrar

1:Show All 2:add Circle 3:add Rectangle 4:add Square

LOGIC FOR MENU

**package** Lab\_6\_1;

**import** java.util.Scanner;

**public** **class** logic {

**static** Scanner *sc* = **new** Scanner(System.***in***);

**int** ch = 0;

**static** **int** *index* = 0;

// Shape s=new Shape(); cannot create instance/object of abstract class

**static** Shape[] *s* = **new** Shape[5];

**public** **static** **void** show() {

**for** (**int** i = 0; i < *s*.length; i++) {

**if** (*s*[i] != **null**) {

System.***out***.println((i + 1) + " " + *s*[i]);

**if**(*s*[i] **instanceof** Circle)

{

System.***out***.println("Area of Circle = "+((Circle)*s*[i]).area()+"\n");

}

**else** **if**(*s*[i] **instanceof** Square)

{

System.***out***.println("Area of Sqaure = "+((Square)*s*[i]).area()+"\n");

}

**else**

System.***out***.println("Area of Rectangle = "+((Rectangle)*s*[i]).area()+"\n");

}

}

**if** (*index* == 0)

System.***out***.println("Array is empty!!!");

}

**public** **static** **void** addCircle() {

**if** (*index* < *s*.length) {

System.***out***.println("Enter radius and shape elements :- ");

Shape s\_temp = **new** Circle(*sc*.nextInt(), *sc*.nextInt(), *sc*.nextInt());

*s*[*index*] = s\_temp;

System.***out***.println("Circle Added Successfully!!!");

*index*++;

} **else**

System.***out***.println("Array is full!!!");

}

**public** **static** **void** addRectangle() {

**if** (*index* < *s*.length) {

System.***out***.println("Enter length width and shape elements :- ");

Shape s\_temp = **new** Rectangle(*sc*.nextInt(),*sc*.nextInt(), *sc*.nextInt(), *sc*.nextInt());

*s*[*index*] = s\_temp;

System.***out***.println("Rectangle Added Successfully!!!");

*index*++;

} **else**

System.***out***.println("Array is full!!!");

}

**public** **static** **void** AddSquare() {

**if** (*index* < *s*.length) {

System.***out***.println("Enter side and shape elements :- ");

Shape s\_temp = **new** Square(*sc*.nextInt(), *sc*.nextInt(), *sc*.nextInt());

*s*[*index*] = s\_temp;

System.***out***.println("Square Added Successfully!!!");

*index*++;

} **else**

System.***out***.println("Array is full!!!");

}

}

SHAPE

**package** Lab\_6\_1;

**public** **abstract** **class** Shape {

**private** **int** x,y;

**public** Shape(**int** x,**int** y) {

**this**.x=x;

**this**.y=y;

}

**public** Shape()

{

x=10;y=20;

}

@Override

**public** String toString()

{

**return** " , Elements of Shape : "+x+" "+y;

}

**public** **abstract** **double** area();

}

CIRCLE

**package** Lab\_6\_1;

**public** **class** Circle **extends** Shape{

**private** **double** radius;

**public** Circle(**int** x, **int** y,**double** radius) {

**super**(x, y);

**this**.radius=radius;

}

**public** String toString() {

**return** "Circle (radius) = "+radius+**super**.toString();

}

**public** **double** area() {

**return** 3.14\*radius\*radius;

}

}

SQUARE

**package** Lab\_6\_1;

**public** **class** Square **extends** Shape {

**private** **double** side;

**public** Square(**int** x, **int** y,**double** side) {

**super**(x, y);

**this**.side=side;

// **TODO** Auto-generated constructor stub

}

@Override

**public** String toString() {

**return** "Square(side) = "+" "+side+ **super**.toString();

}

**public** **double** area() {

**return** side\*side;

}

}

RECTANGLE

**package** Lab\_6\_1;

**public** **class** Rectangle **extends** Shape {

**private** **double** a,b;

**public** Rectangle(**int** x, **int** y ,**int** a ,**int** b) {

**super**(x, y);

**this**.a=a;

**this**.b=b;

}

**public** String toString() {

**return** "Rectangle(sides) = ("+**this**.a+" , "+**this**.b+")" + **super**.toString() ;

}

**public** **double** area() {

**return** a\*b;

}

}

MAIN

**package** Lab\_6\_1;

**import** java.util.Scanner;

**public** **class** Test\_Shape {

**public** **static** **void** main(String[] args) {

Scanner sc = **new** Scanner(System.***in***);

**int** ch = 0, index = 0;

// Shape s=new Shape(); cannot create instance/object of abstract class

Shape[] s = **new** Shape[5];

**do** {

System.***out***.println("\n1.Show All 2.Add Circle 3.Add Rectangle 4.Add Square 5.Exit ");

System.***out***.println("Enter Choice :- ");

ch = sc.nextInt();

**switch** (ch) {

**case** 1:

logic.*show*();

**break**;

**case** 2:

logic.*addCircle*();

**break**;

**case** 3:

logic.*addRectangle*();

**break**;

**case** 4:

logic.*AddSquare*();

**break**;

**case** 5:

System.***out***.println("Exiting...");

**default**:

System.***out***.println("Enter valid choice!!!");

}

} **while** (ch != 5);

}

}





