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CSE 3381

HW 07

Python Code

```
class Shape:
    # no __init__ function -> no instantiation
    def getArea(self):
        print 'Abstract Class'
```

```
from Shape import Shape

class Circle(Shape):
    radius = 0

    # init for instantiation
    def __init__(self, inputRadius):
        self.radius = inputRadius

    # define getArea function from Shape function
    def getArea(self):
        return self.radius * self.radius * 3.14159
```

```
from Shape import Shape

class Rectangle(Shape):
    width = 0
    height = 0

    # init for instantiation
    def __init__(self, inputWidth, inputHeight):
        self.width = inputWidth
        self.height = inputHeight

    def getArea(self):
        return self.width * self.height
```

```
def manager():

    import Circle
    import Rectangle

    c1 = Circle.Circle(1)
    c2 = Circle.Circle(2)
    c3 = Circle.Circle(3)
    c4 = Circle.Circle(4)
```

```
    r1 = Rectangle.Rectangle(1, 2)
    r2 = Rectangle.Rectangle(3, 4)
    r3 = Rectangle.Rectangle(5, 6)
    r4 = Rectangle.Rectangle(7, 8)

    shapeList = []
    shapeList.append(c1)
    shapeList.append(c2)
    shapeList.append(c3)
    shapeList.append(c4)
    shapeList.append(r1)
    shapeList.append(r2)
    shapeList.append(r3)
    shapeList.append(r4)

    totalArea = 0

    for Shape in shapeList:
        totalArea += Shape.getArea()

    print("The Total Area of all Shapes : ")
    print(totalArea)

manager()
```

Outcome

```
C:₩Python27₩python.exe C:/Users/Ig/PycharmProjects/untitled2/Manager.py
The Total Area of all Shapes :
194.2477

Process finished with exit code 0
```

Java Code

```
//shape
public abstract class Shape {
    //abstract funciton
    public abstract float getArea();
}
```

```
//circle
public class Circle extends Shape {

    private float radius;
    //Constructor
    public Circle (float inputRadius) {
```

```
        this.radius = inputRadius;
    }
    //override getArea function
    public float getArea() {
        return this.radius * this.radius * 3.14159f;
    }
}
```

```
//rectangle
public class Rectangle extends Shape {

    private float width;
    private float height;
    //constructor
    public Rectangle (float inputWidth, float inputHeight) {
        this.width = inputWidth;
        this.height = inputHeight;
    }
    //override getArea function
    public float getArea() {
        return this.width * this.height;
    }
}
```

```
//Manager
import java.util.ArrayList;

public class Manager {
    public static void main (String [] args) {
        //create circles
        Circle c1 = new Circle (1);
        Circle c2 = new Circle (2);
        Circle c3 = new Circle (3);
        Circle c4 = new Circle (4);

        //create rectangles
        Rectangle r1 = new Rectangle (1, 2);
        Rectangle r2 = new Rectangle (3, 4);
        Rectangle r3 = new Rectangle (5, 6);
        Rectangle r4 = new Rectangle (7, 8);

        //create list of shapes
        ArrayList<Shape> shapeList = new ArrayList<Shape>();
        shapeList.add(c1);
        shapeList.add(c2);
        shapeList.add(c3);
        shapeList.add(c4);
        shapeList.add(r1);
        shapeList.add(r2);
        shapeList.add(r3);
        shapeList.add(r4);

        //get the total area from iterating over the list
        float totalArea = 0.0f;
```

```
        //cast
        for (Shape obj : shapeList) {
            totalArea += obj.getArea();
        }
        //print
        System.out.println("The Total Area of all Shapes are : " + totalArea);
    }
}
```

Outcome