Java Programming

Assignment 11

Advanced Arrays – *Creating and Iterating through Object Arrays*

Step 00

Create a simple HelloWorld App called Assignment11.

```
public class Assignment11 {

   public static void main(String[] args) {
      System.out.println("Hello World!"); // Display the string.
   }

}
```

Step 01

Create an abstract class called Shape:

```
// Class Shape
import java.awt.*;

public abstract class Shape {

            double area;

            public abstract void getArea () ;

}
```

Step 02

Create a child class called Circle that inherits from Shape.

```
// Class Circle
import java.awt.*;

public class Circle extends Shape {

	public Circle (double r) {

		area = 3.14 * r * r;

	}

	public void getArea () {

		System.out.println("Circle's area = " + area);

	};
}
```

Step 03

Create a child class called Square that inherits from Shape.

```
// Class Square
import java.awt.*;

public class Square extends Shape {

	public Square (double s) {

		area = s * s;

	}

      public void getArea () {

		System.out.println("Square's area = " + area);

	};
}
```

Step 04

Update Assignment11 to create a Circle object and a Square object. And then invoke the *getArea*() method of each.

```
public class Assignment11 {

   public static void main(String[] args) {

                        System.out.println("Hello World");

                        Circle circle = new Circle(3);
                        Square square = new Square(2);

                        circle.getArea();
                        square.getArea();

   }
}
```

Step 05

Update Assignment11 to create 2 Circle objects and 2 Square objects. And then invoke the *getArea*() method of each.

```
public class Assignment11 {

   public static void main(String[] args) {

                        System.out.println("Hello World");

                        Circle circle1 = new Circle(3);
                        Circle circle2 = new Circle(3);

                        Square square1 = new Square(2);
                        Square square2 = new Square(2);

                        circle1.getArea();
                        square1.getArea();
                        circle2.getArea();
                        square2.getArea();

   }
}
```

Step 06

Create 2 new arrays, once called *circleArray* and one called *squareArray*. Then create 2 instances of each and iterate through both arrays.

```
public class Assignment11 {

   public static void main(String[] args) {

                        System.out.println("Hello World");

                        Circle circle1 = new Circle(3);
                        Circle circle2 = new Circle(4);

                        Square square1 = new Square(2);
                        Square square2 = new Square(5);

                        Circle[] circleArray = new Circle[2];
                        Square[] squareArray = new Square[2];

                        circleArray[0] = circle1;
                        circleArray[1] = circle2;

                        squareArray[0] = square1;
                        squareArray[1] = square2;

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

                                circleArray[i].getArea();
                                squareArray[i].getArea();

                        }

   }
}
```

Step 07 - The problem to solve and what to turn in.

The code below iterates through the 2 separate arrays - circleArray and squareArray.

Your task is to create an array called shapeArray (that holds 4 shapes) and insert the 4 shapes created by the code below, circle1, circle2, square1, square2.

Now, I want you to create code that iterates through the shapeArray and processes *any* shape. In essence, the code doesn't care which shape it is processing.

All that you need to turn in is your final version of Assignment11.java. So upload that single file to Blackboard.

```
public class Assignment11 {

   public static void main(String[] args) {

                        System.out.println("Hello World");

                        Circle circle1 = new Circle(3);
                        Circle circle2 = new Circle(4);

                        Square square1 = new Square(2);
                        Square square2 = new Square(5);

                        Circle[] circleArray = new Circle[2];
                        Square[] squareArray = new Square[2];

                        circleArray[0] = circle1;
                        circleArray[1] = circle2;

                        squareArray[0] = square1;
                        squareArray[1] = square2;

                        System.out.println("Iterate Through Circle & Square Arrays\n");
                        for (int i = 0; i < circleArray.length; i++) {

                                circleArray[i].getArea();
                                squareArray[i].getArea();

                        }

                        // Add Code Here
   }
```