**AP Computer Science**

**Graphics Classes Assignment**

Create classes ***MyRectangle*** and ***MyOval***.

Both of these classes should include *x1*, *y1*, *x2*, *y2* coordinates, a color

and a Boolean flag to determine whether the shape is filled.

Declare a constructor in each class with arguments for initializing all the instance variables. To help draw rectangles and ovals, each class should provide methods *getUpperLeftX*, *getUpperLeftY*, *getWidth* and *getHeight* that calculate the upper-left *x*-coordinate, upper-left *y*-coordinate, width and height, respectively. The upper-left *x-*coordinate is the smaller of the two *x*-coordinate values, the upper-left *y*-coordinate is the smaller of the two *y*-coordinate values, the width is the absolute value of the difference between the two *x*-coordinate values, and the height is the absolute value of the difference between the two *y*-coordinate values.

Class DrawPanel, which extends JPanel and handles the creation of the shapes, should declare three arrays, one for each shape type. The length of each array should be a random number between 1 and 5. The constructor of class DrawPanel will fill each array with shapes of random position, size, color and fill.

**In addition, modify all three shape classes to include the following:**

a) A constructor with no arguments that sets the shape’s coordinates to 0, the color of the shape to Color.BLACK, and the filled property to false (MyRectangle and MyOval only).

b) *Set* methods for the instance variables in each class. The methods that set a coordinate value should verify that the argument is greater than or equal to zero before setting the coordinate—if it’s not, they should set the coordinate to zero. The constructor should call the *set* methods rather than initialize the local variables directly.

c) *Get* methods for the instance variables in each class. Method *draw* should reference the coordinates by the *get* methods rather than access them directly.