JAVA PROGRAMMING LANGUAGE
Assignment 13

1. Define an interface named *Shape* with a single method named area that calculates the area of the geometric shape:

   public double area();

   Next, define a class named *Circle* that implements *Shape*. The *Circle* class should have an instance variable for the radius, a constructor that sets the radius, accessor/ mutator methods for the radius, and an implementation of the *area()* method.

   Also define a class named *Rectangle* that implements *Shape*. The *Rectangle* class should have instance variables for the height and width, a constructor that sets the height and width, accessor and mutator methods for the height and width, and an implementation of the *area()* method.

   The following test code should then output the area of the *Circle* and *Rectangle* objects:

```
public static void main(String[] args) {
        Circle c = new Circle(4);                    // Radius of 4 Rectangle
        r = new Rectangle(4,3);                      // Height = 4, Width = 3
        ShowArea(c);
        ShowArea(r);
}

public static void ShowArea(Shape s) {
        double area = s.area();
        System.out.println("The area of the shape is " + area);
}
```

2. Modify the Person class created in Assignment 5 to implement the Java *Comparable* interface.

   Define the *compareTo* method to order Person objects based on the person ID number. In the main method, create an array of at least five Person objects, sort them using *Arrays.sort*, and output the person objects. They should be listed by ascending person id number.

3. Next, modify the *compareTo* method so it orders Person objects based on the lexicographic ordering of their last name. Without modification to the main method, the program should now output the person objects ordered by name.