**Objectives:**

* *Learn the concept of inheritance.*
* *Learn the keywords used for inheritance.*
* *Learn overriding functions of superclass.*
* *Learn to override toString()*

**SuperClass: Rectangle**

A Rectangle class represents a rectangle. It has a getArea() method to compute its area as follows;

**public** **class** Rectangle {

**private** **double** length;

**private** **double** width;

**public** **double** getLength() {}

**public** **double** getWidth() { }

**public** **double** getArea() {}

}

**Assignments:**

**Frist**, implement a **ThreeDRectangle** class that inherits from Rectangle. The ThreeDRectangle class should have a method getSurfaceArea() to compute the surface area of this 3d rectangle, that is, the sum of all six face areas. It may need other instance variables or methods. The goal is to compute the surface area. So think about what the 3d rectangle class can inherit from the superclass and what needs to be added to the class.

**public** **class** ThreeDRectangle **extends** Rectangle {

// YOUR CODE

**public** **double** getSurfaceArea() {}

// YOUR CODE

}

**Second**, implement a test class to test the getArea() and getSurfaceArea() methods. We provided a text file called “INPUT” which contains a couple of rectangles and 3d rectangles. The user can entry command through the console. For here, we only accept two commands, “import INPUT” and “!exit”. When the user type in “import INPUT”, the program will import the data in the INPUT file, and compute the area of those shapes. The output should be formatted as follows:

Rectangle: width = 2, length = 4 followed by its area for rectangle

And

ThreeDRectangle: width = 2, length = 3, height = 4 followed by its surface area for 3d rectangle

All the classes have been provided.

(Note: when you import data from INPUT, you should identify which shape first, then call the methods to compute area accordingly. )