Lab 8

Create an abstract base class called Shape and move the static variable scaleFactor and the three instance variables id, xLoc and yLoc from RightTriangle to Shape along with the get and set methods for those variables. Implement a Shape constructor and update the RightTriangle constructor to call the Shape constructor for the variables moved to Shape. Then add three abstract methods to Shape called getArea(), getPerimeter() and scaleShape().

Define three classes that extend Shape called Circle, Rectangle and RightTriangle. Much of

RightTriangle can be copied from Lab 7, and much of Circle and Rectangle from the slides and in class work. For each class define the needed instance variables and an appropriate constructor to initializes those instance variables and call the Shape constructor for the instance variables defined on Shape, and then override the four abstract methods defined on Shape.

Write an application which shows the user the following menu and implements all options. The program should continue to run and process requests until the user chooses to exit. The program should double-check that the user really wants to exit. You may use a limit of 10 possible shapes to simplify implementation. All input must be validated and appropriate feedback given for invalid input.

You must use an array of Shapes to hold all objects. You cannot have an array of Circle, Rectangle or RightTriangle objects. Additionally, only option 1 can use the Circle type, only option 2 can use the Rectangle type and only option 3 can use the RightTriangle type. Options 4-7 may only use the Shape type.

1 – Add a new circle

2 – Add a new rectangle

3 – Add a new right triangle

4 – Delete a shape

5 – Delete all shapes

6 – Display all shapes

7 – Move a shape

8– Enter a scale factor

9– Scale all shapes

10– Exit program