Program #6 Instructions

Create an abstract class called **Shape** with the protected member String **shapeName.** It should have two public abstract methods **getArea** and **getVolume**. Finally, it should contain a public String method called **getName** which returns the **shapeName**. You should create a **Circle** class, **Square** class, **Rectangle** class, **Triangle** class which extend the Shape class.

Each class should contain the necessary private variables. For example, a square has a side. The area and the volume can all be derived from the side value so the only private variable necessary for the square class is the side. The circle requires a radius. The triangle requires a base, length and a height. Finally, the rectangle requires length, height and width. The classes should also contain constructors and appropriate implementations of the two abstract methods **getArea** and the **getVolume**.

Shape Calculator
Enter 1 for a Circle
Enter 2 for a Square
Enter 3 for a Rectangle
Enter 4 for a Triangle
Enter 5 to Exit

You should use a menu with a case/switch statement that allows the user to choose which shape they want. After the user enters their **choice**, ask them to enter the necessary information, perform the calculations and display the area and volume for the shape the user chose. The program should continue to allow the user to choose shapes and display the results until the user enters 5 to exit.

Triangle volume: length * base * height/3
Triangle area: base * height/2
Circle area: Math.PI * radius * radius
Circle volume: 4/3 * Math.PI * radius * radius * radius
Square area: side * side
Square volume: side * side * side
Rectangle area: length * width
Rectangle volume: length * width * height

Be sure to verify the user enters positive numbers and limit the display to 2 decimals.