Quiz 4 Programming Exercise

Write a Java program that calculates the perimeter and area of circles, squares, and rectangles.

1. Create and turn in a UML class diagram that shows all of your classes. Use appropriate notation on your diagram to indicate private and public data fields and methods along with any static fields or methods you may define.
2. Make sure your program produces the same output for the three sample runs shown.
3. You must upload your source code for review. A large portion of your grade will be based on how well you have incorporated and used the OOP best practices we discussed in class.
4. Make sure you write accessor and mutator methods for data fields that are appropriate.
5. Use appropriate data types for your internal data.
6. Put your main method in a separate class to test your application. Once you have your classes written, your main method should produce output as shown on the Sample Runs.
7. If objects are created using no-arg constructors use 1.0 for the radius and all sides of squares and rectangles.

Please make sure to follow coding guidelines:

1. Put a comment at the top of your code to identify what your program will do.
2. Include your name, date, and student number in the header comment.
3. Comment your code to explain your strategy for solving the problem.

You should look at the program output before you start coding, as this will help you to make sure you understand the nuances of the application before starting your work.

Sample Run:

```
Enter a SINGLE number. This will be used for the circle radius, the square's side, and one
side of the rectangle:
1
Enter the other side of the rectangle:
1

Circle area: 3.14159
Square area: 1.0
Rectangle area: 1.0

Circle perimeter: 6.28318
Square perimeter: 4.0
Rectangle perimeter: 4.0
```

Sample Run:

```
Enter a SINGLE number. This will be used for the circle radius, the square's side, and one
side of the rectangle:
10
Enter the other side of the rectangle:
12

Circle area: 314.159
Square area: 100.0
Rectangle area: 120.0

Circle perimeter: 62.8318
Square perimeter: 40.0
Rectangle perimeter: 44.0
```

Sample Run:

```
Enter a SINGLE number. This will be used for the circle radius, the square's side, and one
side of the rectangle:
5.7
Enter the other side of the rectangle:
6.3

Circle area: 102.0702591
Square area: 32.49
Rectangle area: 35.91

Circle perimeter: 35.814126
Square perimeter: 22.8
Rectangle perimeter: 24.0
```