CSC 230: Elementary Data Structures and Algorithms

Assignment Five

Objective:

To work with inheritance
To work with files

Assignment:

Create a package called **lastNameFirstInitialHW5**. (Mine would be called KikuchiCHW5). You will use the abstract GeometricObject class from your book (Listing 13.1 on page 500). You will create a new Triangle class that extends the GeometricObject class and then implements the Triangle class. This program will be a multi-class package with three classes, the main class (used for testing), the abstract class GeometricObject, and the new Triangle class.

Design the new Triangle class that extends the abstract GeometricObject class. Implement the new Triangle class by writing a test program (main) that prompts the user to enter three sides of the triangle, a color, and a Boolean value to indicate whether the triangle is filled. The program should create a Triangle object with these sides and set the color and filled properties using the input.

The program should display the area, perimeter, color, and true or false to indicate whether it is filled or not. The data will be printed to the screen. The program will also use FileOutputStream to send the output to a file called triangleOut.out.

Notes:

- When you are testing the program, remember that any side of a triangle must be shorter than the other two sides added together.
- The program should handle I/O Exceptions. You can opt to use the try-with-resources.
- The file output can be handled within the main class. Typically, you will have the print line to print to the screen and under it the line that will print to the file.

Above the class header, write a javadoc comment containing the integrity policy statement. Under the integrity statement, add comments on your program that show the title of the program (lastNameFirstInitialHW2), your first and last name, and the course name (CSC 230, Sec #). As the first print lines for your program under the main method, make sure that the run screen also prints the title of the program (lastNameFirstInitialHW2), your first and last name, and the course name (CSC 230, Sec #), and the program information as shown in the sample run screen.

Your program must compile. Programs that do not compile will not be accepted.

To Submit this homework:

Turn in, **via the Assignments area** the package called **lastNameFirstInitialHW5** as a **zipped file**

SAMPLE RUN SCREEN #1

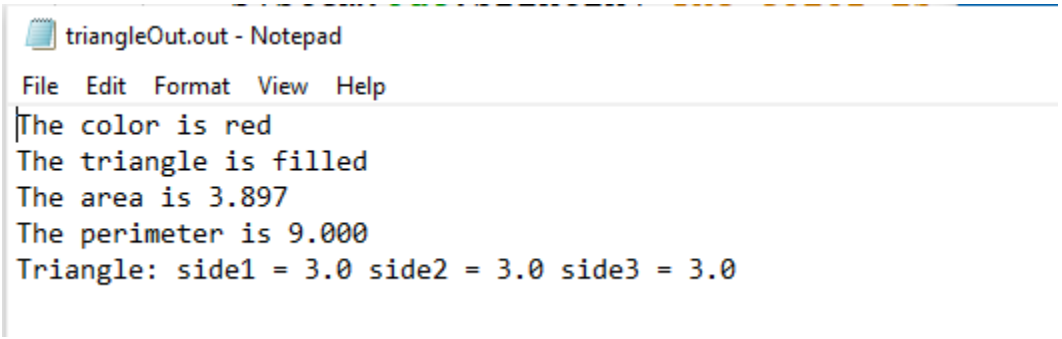
KikuchiCHW5
Christine Kikuchi
CSC 230, Sec #

This program consists of three classes, a main class, the GeometricObject class, and a Triangle class.
The Triangle class extends from the GeometricObject class.
The user will be asked to enter the 3 sides and the color of the triangle.
The user will also be asked to enter if the triangle is filled or not by entering a true if it is filled and a false if it not filled
The results will be printed to the screen and to a file called triangleOut.out. When the program is run again, the new data will be appended to the old data in the file.

Enter the 1st of three sides: 3
Enter the 2nd of three sides: 3
Enter the 3rd of three sides: 3
Enter the color: red
Enter a Boolean value for filled (true or false): true

The color is red
The triangle is filled
The area is 3.897
The perimeter is 9.000
Triangle: side1 = 3.0 side2 = 3.0 side3 = 3.0

triangleOut.txt



SAMPLE RUN SCREEN #2

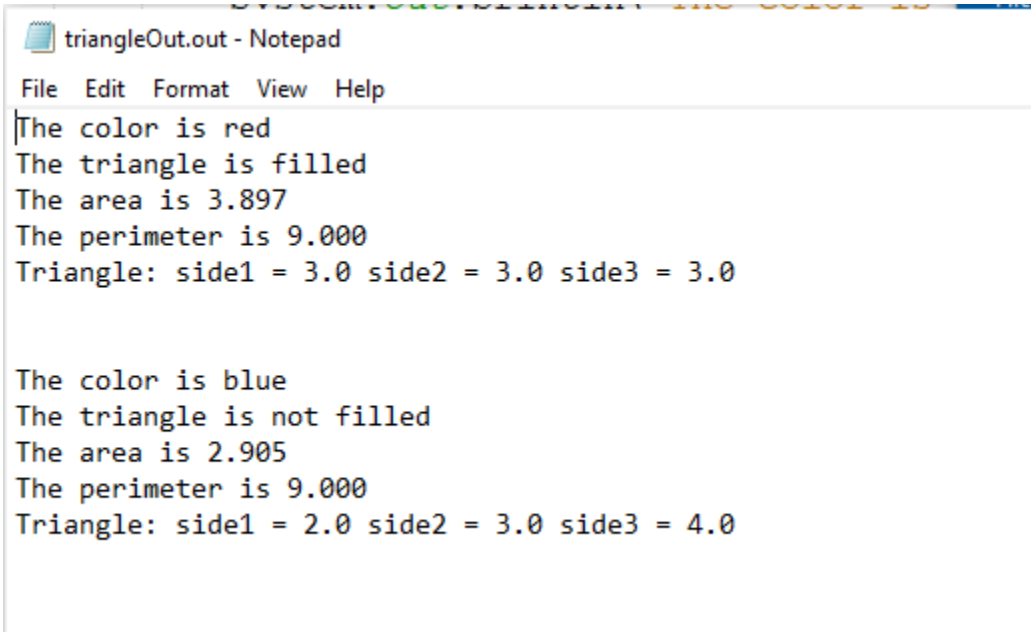
KikuchiCHW5
Christine Kikuchi
CSC 230, Sec #

This program consists of three classes, a main class, the GeometricObject class, and a Triangle class.
The Triangle class extends from the GeometricObject class.
The user will be asked to enter the 3 sides and the color of the triangle.
The user will also be asked to enter if the triangle is filled or not by entering a true if it is filled and a false if it not filled
The results will be printed to the screen and to a file called triangleOut.out

Enter the 1st of three sides: 2
Enter the 2nd of three sides: 3
Enter the 3rd of three sides: 4
Enter the color: blue
Enter a Boolean value for filled (true or false): false

The color is blue
The triangle is not filled
The area is 2.905
The perimeter is 9.000
Triangle: side1 = 2.0 side2 = 3.0 side3 = 4.0

triangleOut.txt



Homework Five Rubric	
The package is called lastNameFirstInitialHW5	2
The package has 3 classes, main, GeometricObject, and Triangle	4
The GeometricObject class is created by copying Listing 13.1 from the book into a class called GeometricObject	4
Main class	
The class starts with a Javadoc comment that is the Academic Integrity statement	2
Under the Academic Integrity statement, there are the comments that show the title of the program, the programmer's first and last name, and the course name and section #.	2
The first print lines print the title of the program, the programmer's first and last name, and the course name and section #, and the program information as shown in the sample run screen	2
The user is asked to enter the 3 numbers, the color, and if the triangle is filled or not	4
The program is setup to allow writing to a file	4
The DataOutputStream object is created	4

The class uses error checking for the file activity	4
The file is appended to when the program is run again	6
The file is closed	2
The class calls the setFilled() and setColor() methods from the triangle class	4
The filled is tested to see if it is filled or not and the appropriate message is printed depending on the condition: The triangle is filled Or The triangle is not filled	4
The class calls the getArea() and getPerimeter() methods from the triangle class	6
The correct formatted print lines are shown in the output window	4
The correct formatted print lines are shown in the file called triangleOut.out	6
Triangle class	
The class created the 3 data fields: side1 = 1.0, side2 = 1.0, side3 = 1.0;	4

The default constructor is created	4
A second constructor is created that sets the sides	6
The getArea() in GeometricObject is implement from the abstract method	6
The getPerimeter() in GeometricObject is implemented from the abstract method	6
A method called toString() is implemented to return the three sides to give the sentence: Triangle: side1 = # side2 = # side3 = # Where # are the numbers that the user entered. The method uses the @Override annotation.	6
The run of the program both on screen and in the file look like the sample	4