Seneca College

Applied Arts & Technology
SCHOOL OF COMPUTER STUDIES

JAC444 **Submission date:** **Date**

Workshop 3

Description:
The following workshop lets you practice basic java coding techniques, creating classes, methods, using arrays, inheritance, polymorphism, Exceptional Handling.

Task – 1:

Design an **abstract** class named **GeometricObject** that contains:

- A private **String** data field named *color* (default value "*white*")
- A private **Boolean** data field named filled.
- A no-arg constructor.
- A protected overloaded constructor *GeometricObject(String color, boolean filled).*
- The accessor and mutator methods for *color* and *filled.*
- An abstract method **getArea()**
- An abstract method **getPerimeter()**

Design another class named **Triangle** that contains:

- **Triangle** class must inherit the **GeometricObject** class.
- Three **double** data fields named **side1**, **side2**, and **side3** with default values **1.0** to denote three sides of the triangle.
- A no-arg constructor that creates a default triangle.
- A constructor that creates a triangle with the specified **side1**, **side2**, and **side3**.
- The accessor methods for all three data fields.
- A method named **getArea()** that returns the area of this triangle.
- A method named **getPerimeter()** that returns the perimeter of this triangle.
- A method named **toString()** that returns a string description for the triangle.
- The formulate to compute the area of the triangle is as follows:

$$s = (\text{side1} + \text{side2} + \text{side3})/2;$$

$$\text{area} = \sqrt{s(s - \text{side1})(s - \text{side2})(s - \text{side3})}$$

- Write a test program 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 the given 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.

Task – 2

Triangle class in *Task – 1* (above), defines a triangle with three sides. In a triangle, the sum of any two sides is greater than the other side. The **Triangle** class must obey/ follow to this rule.

Design a **TriangleException** class, and modify the constructor of the **Triangle** class to throw a **TriangleException** object if triangle is created with sides that violates the rule, as follow:

```
/**Construct a triangle with the specified sides */
public Triangle(double s1, double s2, double s3)
          throws TriangleException{


          //Implementation
}
```

Hint: For not having any confusion you can copy your Triangle class from the Task – 1 and rename it in Task – 2.

Write a test program that will create two **Triangle** class objects one with legal sides and the other will Illegal side.

Note: Students are encouraged to design their own outputs for the both the tasks.

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Workshop Header

/***
Workshop #
Course:*<subject type> - Semester*
Last Name:*<student last name>*
First Name:*<student first name>*
ID:*<student ID>*
Section:*<section name>*
This assignment represents my own work in accordance with Seneca Academic Policy.
Signature
Date:*<submission date>*
***/

Code Submission Criteria:

Please note that you should have:

- Appropriate indentation.
- Proper file structure
- Follow java naming convention
- Document all the classes properly
- Do Not have any debug/ useless code and/ or files in the assignment
- Do not have everything in the *main method*.
- Have a separate TestClass with the main method in it.
- Check your inputs if the user is not entering garbage inputs.
- Use exceptional handling or other methods to let the user know if the inputs are incorrect.

Deliverables and Important Notes:

All these deliverables are supposed to be uploaded on the blackboard once done.

- You are supposed to create video/ record voice/ detailed document of your running solution. **(50%)**
  - Screen Video captured file should state your last name and id, like Ali_123456.mp4 (or whatever the extension of the file is)
  - Record voice clip should also include a separate word file with the screen shots of your program's output, state your last name and id, like Ali_123456.mp3 (or whatever the extension of the file is)

  - Detailed document should include screen shots of your output, have your name and id on the top of the file and save the file with your last name and id, like Ali_123456.docx (or whatever the extension of the file is)
- A word/ text file which will reflect on learning of your concepts in this workshop. Also include the instructions on how to run your code. **(30%)**
  - Should state your Full name and Id on the top of the file and save the file with your last name and id, like Ali_123456.txt
- Submission of working code. **(20%)**
  - Make sure your follow the "**Code Submission Criteria"** mentioned above.
  - You should zip your whole working project to a file named after your Last Name followed by the first 3 digits of your student ID. For example, **Ali123.**zip.
- Your marks will be deducted according to what is missing from the above-mentioned submission details.
- Late submissions would result in additional 10% penalties for each day or part of it.
- Remember that you are encouraged to talk to each other, to the instructor, or to anyone else about any of the assignments, but the final solution may not be copied from any source.