CSE1030 Lab 04

Thursday, July 17, 2014
Due: Monday, July 21, 2014, before 17:00

Introduction

The goals of this lab are to implement a small class representing 2D triangles with their vertex positions and colours.

You will need to implement the following features in your class:

- constructors
- accessor methods
- mutator methods
- `toString` methods

Implement a mutable triangle class

Implement the class named **`Triangle2D`** that represents a triangle on a real 2D plane. Every `Triangle2D` object consists of 3 points with their *x* and *y* coordinates. In this assignment, your class should use composition to manage the colour and aggregation to manage the points.

Colour should be represented with `java.awt.Color`.

Points should be represented with `java.awt.geom.Point2D`.

Create a separate class to test your `Triangle2D` class. This class will not be marked and need not be submitted.

In eclipse:

1. Create a new Java Project (perhaps called `lab4`)
2. In your project, create a new Package named `cse1030.drawing`
3. In the package `cse1030.drawing` create a new Java class named `Triangle2D`.
4. Complete the class `Triangle2D` so that it implements the API (to be given separately):

This means that you must create and complete the following fields, constructors, and methods:

```
o  Triangle2D (Triangle2D t) //creates a copy of the triangle
o  Triangle2D (java.awt.geom.Point2D p1, java.awt.geom.Point2D p2,
   java.awt.geom.Point2D p3) //A triangle from 3 points
o  setA, setB, setC (java.awt.geom.Point2D p) //set vertices
o  java.awt.geom.Point2D p getA, getB, getC () //get vertices
o  setColour(java.awt.Color colour) //set colour
o  java.awt.Color getColour() //get colour
```

- numInstances()
- equals(Object obj)//true if triangles have the same set of points
  //and the same colour
- toString() //should print the colour and all points ((1.1, 1.2), (1.3, 1.4), (1.5, 1.6), *colour from java.awt.Color. toString()*)

5. Finally, create a main function that demonstrates how your code works, all methods, etc. E.g.,

```
Point 1: (3.0, 3.2)
Point 2: (5.0, 3.8)
Point 3: (6.0, 3.7)
…
Point <n-1>: (6.0, 4.7)
Point <n>: (6.0, 5.7)

Triangle 1: …
Triangle 2: …
Triangle 3: …
…

Set colour…
Set point 3: (x , y)
…

T2 is equal to T4: false
T3 is equal to T4: false
```

Submit

Submit your solution using the `submit` command. Remember that you first need to find your workspace directory, then you need to find your project directory.

```
submit 1030 L4 Triangle2D.java
```

Alternatively, you may use the web form at
`https://webapp.eecs.yorku.ca/submit/index.php`

Some things to think about

- Where do you need to use aggregation and where composition is more appropriate?