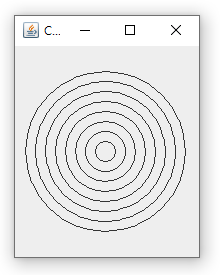
**OOP Lab 12**

|  |  |  |  |
| --- | --- | --- | --- |
| Name: |  | Department: |  |
| Student ID: |  | Room Number: |  |
| Due Date: | June 8, 23 : 59 | | |

**Submit your assignment using the following file format:**  LabNumber\_StudentName.zip (eg. Lab12\_Hongkildong.zip). This zip file will contain **two types of** files, namely: **report file** with file format **“Report\_Lab number**” (eg. report\_12) to answer theory questions and to write the screen shot of your program and Source code file that contains codes of classes to answer programming questions.

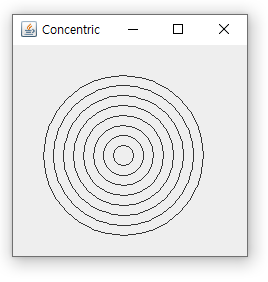
**Q1**. The source code of an application that draws a series of eight concentric circles is given in the files “**CirclesJPanel.java” and** “**Circles.java”** in the folder “**CodeQ1”.** The circles are separated by 10 pixels. Hence, complete the partial source code in the file “Circles.java”. After your completed the code, the following figure should be displayed when you run the program.



* **Requirement 1:** the title for the frame is “Concentric Circles”.
* **Requirement 2**: the size for the frame is 200 x 250.
* **Requirement 3**: The number of circles are 8
* **Requirement 4**: The distance between two adjacent circles is 10 pixels.

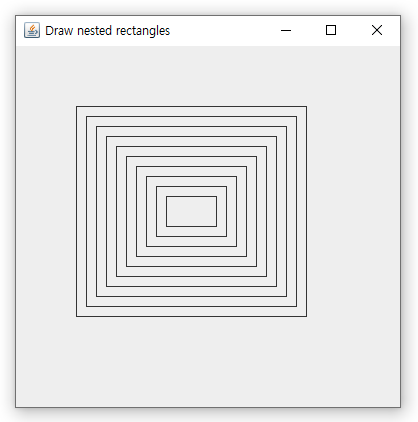
**Q2**. **Modify** your solution to **Q1** to draw the **ovals b**y using **Ellipse2D.Double** class and **draw** () method of

**Graphics2D** class. Hence, complete the codes in files “**Concentric.java**” and “CirclesJPanel.java” under the folder **CodeQ2**. When you run the code after completing the code, the following figure is displayed.



* **Requirement 1: the title for the frame is “Concentric Circles”.**
* **Requirement 2: the size for the frame is 250 x 250.**
* **Requirement 3: The number of circles are 8**
* **Requirement 4: The distance between two adjacent circles is 10 pixels.**
* **Hint 1**: refer the constructor of **Ellipse2D.Double() s** from **java.awt.geom package** ;
* **Hint 2: refer the draw** () method of  **Graphics2D class from java.awt.geom package**

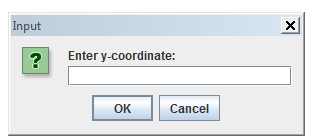
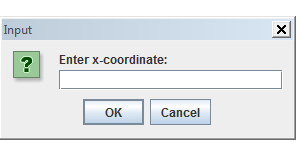
**Q3.**  The source code of an application that draws **ten** nested rectangles using **Rectangle2d.Double** class is given. The rectangles are separated by 10 pixels on all sides. Complete the partial source code in the files “DrawRectangles.java” and **“**RectanglesPanel.java” under the folder **CodeQ3.** When you run the code, the following figure is displayed.



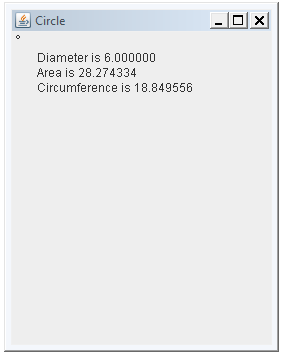
* Requirement 1: the title for the frame is “**Nested Rectangles**”.
* Requirement 2: the size for the frame is 400 x 400.
* Requirement 3: The number of rectangles are 10
* Requirement 4: The distance between two adjacent rectangles is 10 pixel

**Q4.** The source code of an application that asks the user to **input the radius** of a circle as a floating-point number and then display the values of the circle’s diameter, circumference and area. Use the value 3.14159 for **п**. Complete the partial source code in the file **“Circle.java” under CodeQ4.** When you run the code, the following 4 figures are displayed sequentially.

* When you run the code, first, figure in (a) is displayed.
* When you click “Ok” button after entering the value of radius, the figure in(b) is displayed,
* When you click “Ok” button after entering the value of x-coordinate , the figure in(c) is displayed,
* **When you click “Ok” button after entering the value of y-coordinate, the figure in (d) is displayed.**



1. **b) c)**

 **d)**