CSC 1302 Principles of Computer Science II

Assignment 3: Writing Java Programs with Arrays, Objects

(Due on 11:59 pm, 6/29/2021)

Purpose:

An array is a container object that holds a fixed number of values of the same type. The length of an array is established when the array is created. After creation, its length is fixed. An array is used to store a collection of data, but it is often more useful to think of an array as a collection of variables of the same type. Following are some important points about Java arrays.

- The variables in the array are ordered and each have an index beginning from 0.
- Java array can be used as a static field, a local variable, a method parameter, or a return type.
- Array can contain primitives (int, char, etc) as well as object (or non-primitives) references of a class depending on the definition of array. In case of primitive data types, the actual values are stored in contiguous memory locations. In case of objects of a class, the reference to the actual objects are stored.
- 2D Arrays can be defined in simple words as array of arrays. Data in multidimensional arrays are stored in tabular form.

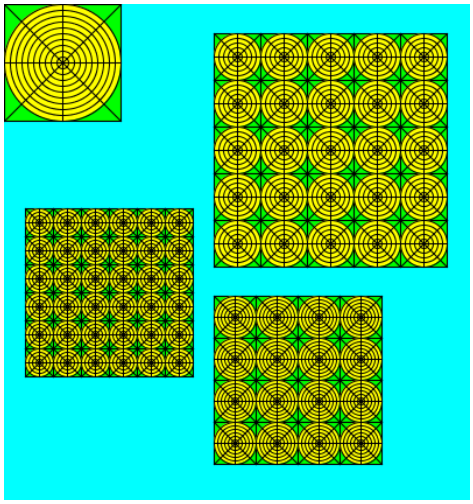
In this assignment, we will refresh what we learned about arrays and graphics objects in java The graphics assignment will have to use the DrawingPanel.java file to draw a window on the screen first, then draw shapes on the Graphics object.

Program #1:

Write a program of a game of Tic-Tac-Toe that represents the board by using of 2D Array.

- Play the game 1 time for 2 players;
- Show who the winner is (Player 1, Player 2, or Draw)
- Name the program as TicTac.java, a screen output will be similar to the following.

Program #2:
Finish the following programming project. An output picture will be like the following. A scanned copy of the project description is also attached.



Programming Projects

1. Write a program that draws the patterns shown in Figure 3G.33 onto a `DrawingPanel`.

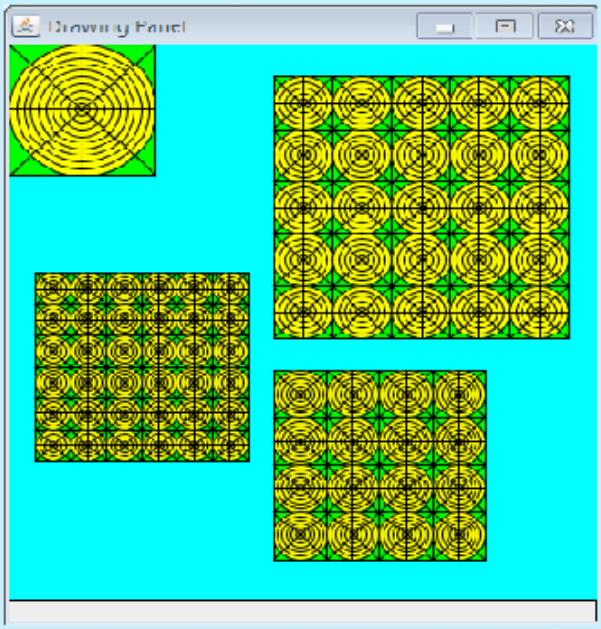


Figure 3G.33

The `DrawingPanel`'s size is 400 × 400 pixels and its background color is cyan. It contains four figures of concentric yellow circles with black outlines, all surrounded by a green rectangle with a black outline. The four figures on your `DrawingPanel` should have the properties shown in Table 3G.7.

Table 3G.7 Circle Figure Properties

Description	(x, y) position	Size of subfigures	Number of circles	Number of rows/cols
top left	(0, 0)	100 × 100	5	1 × 1
bottom left	(10, 120)	24 × 24	4	5 × 5
top right	(150, 20)	40 × 40	5	6 × 6
bottom right	(130, 275)	36 × 36	3	3 × 3

Break down your program into methods for drawing one subfigure as well as larger grids of subfigures, such as the 5 × 5 grid at (10, 120).

Criteria:

1. Upload all of the .java and the .class files to the CSc1302 dropbox on http://icollege.gsu.edu.
2. Your assignment will be graded based on the following criteria: (a) Are your programs runnable without errors? (b) Do your programs complete the tasks with specified outputs? (c) Do you follow the specified rules to define your methods and programs? (d) Do you provide necessary comments include the programmer information, date, title of the program and brief description of the program.

3. Make sure that both the .java and .class files are named and uploaded to icollege correctly. If any special package is used in the program, be sure to upload the package too. Should you use any other subdirectory (whatsoever) your program would not be graded, and you will receive a **0 (zero)**.
4. No copying allowed. If it is found that students copy from each other, all of these programs will get **0**.