# CSC 130: Introduction to Computer Science

## Lab Seven

Objectives:

To create a module-based program
To create methods
To call methods.

**Note:** This lab will cover concepts from Chapter Six, Sections 6.1-6.8. You will not use any material from Sections 6.7-6.11.

**Assignment:**

You will create a new program called **LastNameFirstInitialLab7**.

Add the necessary import statement(s), and the comments for the integrity statement, lab number, and programmer name and course name in the correct places. As always, it must also print out the lab #, programmer's name, course name and section #, and the program information.

The program will show a user a menu that allows him or her to have the program calculate the area of a square, rectangle, or circle. The menu is in a loop so the user may use it as often as he wishes. The code for the calculations is in methods called by main.

If the user chooses 1, then the program will call the method called **squareArea**. This method will ask the user to enter the length of one side of the square. The program will then calculate the area of a square.
The formula is area = side * side

If the user chooses 2, then the program will call the method called **rectangleArea**. This method will ask the user to enter the length of the rectangle and then to enter the width of the rectangle. The program will then calculate the area of a rectangle.
The formula is area = length * width

If the user chooses 3, then the program will call the method called **circleArea**. This method will ask the user to enter the radius of the circle. The program will then calculate the area of a circle.
The formula is area = PI * radius * radius.

> **Note:** In order to use PI, the identifier PI will need to de defined as a constant with the value of PI = 3.14159. Typically, so that any part of a program can access a constant, it will be declared in between the class header and the main method. The declaration will be:
> **static final double PI = 3.14159;**

Choice 4 will quit the program. Before it quits, it will say, "Thank you for using my program!" You may write this code within your main method if you wish.

If the user selects a number that is not on the menu, an error message should be displayed, and the user will be allowed to re-enter until a correct menu choice is made.

**Notes:**
- I recommend that you use a do while loop.
- I also recommend that you set up all other parts of the program and make sure each works. Do loops last!
- The only variable that will defined in main is the menu choice variable. All other variables used in this program will be defined in the methods to which they belong.
- The methods will accept the input and do the calculations. No printing will be done in a method.
- Your program must look like the sample using the same verbiage. I suggest that you look at the samples before you begin so you will know what this program will look like. You may be as creative with the look of the menu as you wish to be.
- Do <u>not</u> go above the objectives of the assignment.
- The grading rubric is at the end of the assignment.

## Bonus (5 additional points):

Add a void method called **printStars** that use a nested for loop to print stars (asterisks) in an upside down half triangle. See the sample. Change the menu to have the call to this method be choice 4 and then quitting will become choice 5.

## To Submit this lab:

In Canvas, upload the Java file to the assignment. This will be the file called **LastNameFirstInitialLab7.java**.

## SAMPLE RUN SCREEN
**Values shown in bolded blue are variables.**

Lab Seven
Christine Kikuchi
CSC 130, Sec #

This program will show the user a menu that allows him to have
 the program calculate the area of a square, rectangle, or circle.
The menu is in a loop so the user may use it as often as he wishes.
The code for the calculations is in methods called by main.


```
*************************************************************
          Menu
      1 - Square
      2 - Rectangle
      3 - Circle
      4 - Quit the program
*************************************************************
Please make your choice from the menu: 0
Invalid choice. Please select 1, 2, 3, or 4.  5
Invalid choice. Please select 1, 2, 3, or 4.  15
Invalid choice. Please select 1, 2, 3, or 4.  -98
Invalid choice. Please select 1, 2, 3, or 4.  2
What is the length of the rectangle? 2
What is the width of the rectangle? 3
The area of the rectangle is 6.00
```

```
************************************************************
          Menu
     1 - Square
     2 - Rectangle
     3 - Circle
     4 - Quit the program
************************************************************
```

Please make your choice from the menu: 1
What is the length of one side of the square? 9
The area of the square is **81.00**

```
************************************************************
          Menu
     1 - Square
     2 - Rectangle
     3 - Circle
     4 - Quit the program
************************************************************
```

Please make your choice from the menu: 3
What is the radius of the circle? 5
The area of the circle is **78.54**

```
************************************************************
          Menu
     1 - Square
     2 - Rectangle
     3 - Circle
     4 - Quit the program
************************************************************
```

Please make your choice from the menu: 5
Invalid choice. Please select 1, 2, 3, or 4.  3
What is the radius of the circle? 19
The area of the circle is **1,134.11**

```
************************************************************
          Menu
     1 - Square
     2 - Rectangle
     3 - Circle
     4 - Quit the program
************************************************************
```

Please make your choice from the menu: 4

Thank you for using my program!

## BONUS SAMPLE RUN SCREEN

Lab Seven Bonus
Christine Kikuchi
CSC 130, Sec #


This program will show the user a menu that allows him to have
 the program calculate the area of a square, rectangle, or circle.
The menu is in a loop so the user may use it as often as he wishes.
The code for the calculations is in methods called by main.
A method called printStars will print stars in a pattern. ← | Added line to program information |


```
************************************************************
        Menu
    1 - Square
    2 - Rectangle
    3 - Circle
    4 - Print star pattern
    5 - Quit the program
************************************************************
```
Please make your choice from the menu: 4

```
*****
****
***
**
*
```

> The mini lecture *Nested Loops* that is in the course modules  will be helpful. You will *decrease* to go backwards.

```
************************************************************
        Menu
    1 - Square
    2 - Rectangle
    3 - Circle
    4 - Print star pattern
    5 - Quit the program
************************************************************
```
Please make your choice from the menu: 5

Thank you for using my program!