

Assignment 9

Encapsulation

The point of this assignment is to cover a few of the basic principles of encapsulation.

Using the IDE

Remember that all code must be submitted in text format.

Initial Code & Output

Load the following code into the online compiler:

<https://www.jdoodle.com/online-java-compiler/>

Please copy the following code into the IDE, compile and run it.

```
// calculate area of rectangle using class in java

import java.io.*;
import java.util.Scanner;

public class EncapsulationDemo
{
    public static void main(String[] args)
    {

        // Create object of Rectangle class

        System.out.println("A09 - Written by Matt Weisfeld\n");

        Scanner console = new Scanner(System.in);

        // Input Strings
        String len=null, wid=null;
        int l=0,w=0;

        // Remove Comment to Create the Rectangle
        // Rectangle rect = new Rectangle(0, 0);

        // Begin while() loop here

        System.out.println("\nBye");
    }
}
```

This code covers a lot of programming concepts. Please take this opportunity to study the code and determine what is going on.

When you execute the code it will look something like this:

The screenshot shows a web browser with two tabs, both titled "Online Java Compiler - Online Ja...". The active tab displays the URL "jdoodle.com/online-java-compiler/". The main area contains a Java code editor with the following code:

```
1 // calculate area of rectangle using class in java
2
3 import java.io.*;
4 import java.util.Scanner;
5
6 public class EncapsulationDemo
7 {
8     public static void main(String[] args)
9     {
10
11         // Create object of Rectangle class
12
13         System.out.println("A09 - Written by Matt Weisfeld\n");
14
15         Scanner console = new Scanner(System.in);
16
17         // Input Strings
18         String len=null, wid=null;
19         int l=0,w=0;
20
21         // Remove Comment to Create the Rectangle
22         // Rectangle rect = new Rectangle(0, 0);
23
24         // Begin while() loop here
25
26         System.out.println("\nBye");
27
28     }
```

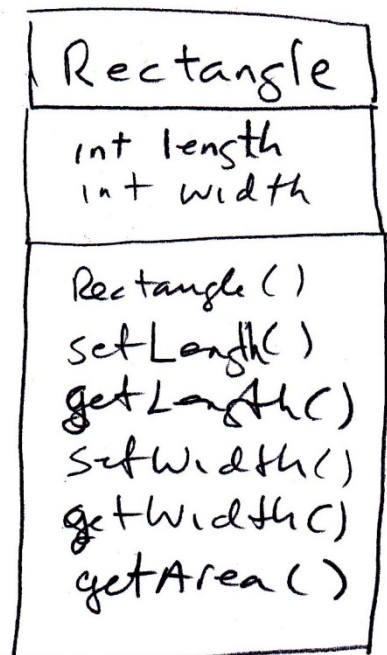
Below the code editor is a control panel with a dropdown menu set to "JDK 11.0.4", an "Interactive" checkbox, and a "Stdin Inputs" text area. There is also a "CommandLine Arguments" text area. An "Execute" button is located below these fields. The "Result" section at the bottom shows the output of the program:

```
Result
CPU Time: 0.32 sec(s), Memory: 33620 kilobyte(s) compiled and executed in 1.201 sec(s)
A09 - Written by Matt Weisfeld
Bye
```

Problem

Note that this is simply a shell to get you started with a clean compile.

The task is to create a Rectangle class that follows the following UML specification.



Here are the constraints that you must include in your program.

- 1) Include an output statement at the beginning of the program with the assignment number and your name:

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- 2) Create a **single** Rectangle object called *rect*.
- 3) Implement a while() loop to accept User input for multiple area calculations (reset *rect*).
- 4) Implement a break statement to terminate the loop.
- 5) Each time through the loop, accept user input for 2 integer variables, length (*first*) and width.
- 6) Terminate the loop when the user enters 'x' for the length (*no need to enter width*).
- 7) Calculate the area of the current *rect*.
- 8) Print the area to the console (*using rect's getArea() method*).
- 9) Print out an exit greeting (Bye) when exiting the application.

Final Output

Once completed, your output (in the following test case) should look like this:

Execute Mode, Version, Inputs & Arguments

GCC 9.1.0

☐ Interactive

Stdin Inputs

CommandLine Arguments

Execute

4

6

5

5

x

Result

CPU Time: 0.00 sec(s), Memory: 3368 kilobyte(s)

```
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-----
Please enter length of the rectangle (or 'x' to end): 4
Please enter width of the rectangle: 6
Area = 24
-----
Please enter length of the rectangle (or 'x' to end): 5
Please enter width of the rectangle: 5
Area = 25
-----
Please enter length of the rectangle (or 'x' to end): x
Program Terminated by User
Bye
```

- Note the input box

What to Submit

A single Java text file should be submitted to Blackboard.