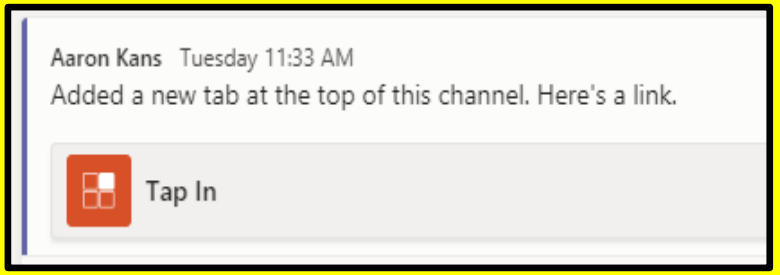
CD/CN4001: Topic 9 Lab

ON CAMPUS

Tap in* with your ID card in a *UEL lab

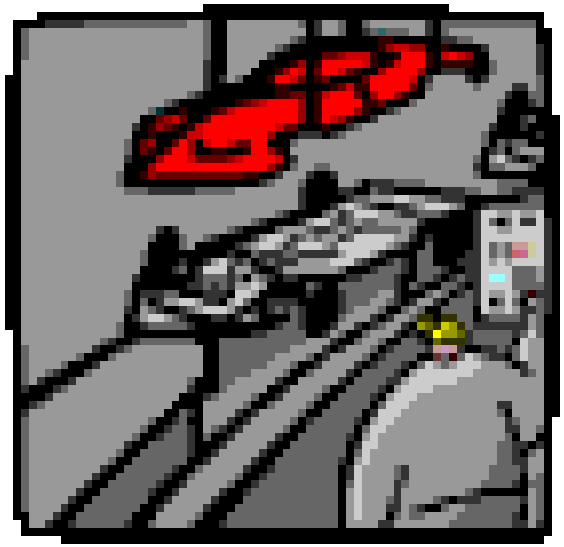
REMOTE

Click on the Tap in tab in the General channel of the Teams site



Implementing Classes: Lecture Review

Looking inside a class….



Implementing Classes: Lecture Review

Rectangle
-length : double *-height : double*
+Rectangle(double, double) *+setLength(double)* *+setHeight(double)* *+getLength( ): double* *+getHeight( ): double* *+calculateArea( ): double* *+calculatePerimeter( ): double*

```
public class Rectangle
{
    // private attributes


    // public methods


}
```

Implementing Classes: Lecture Review

Creating class constants

Circle
-radius : double *+PI: double = 3.1416*
+Circle(double) *+setRadius(double)* *+getRadius( ) : double* *+calculateArea() : double* *+calculateCircumference() : double*

```
public class Circle
{
    private double radius;
    public static final double PI = 3.1416;

}
```

Implementing Classes: Lecture Review

We will complete and test this Circle class in the lab session today

Circle
-radius : double *+PI: double = 3.1416*
+Circle(double) *+setRadius(double)* *+getRadius( ) : double* *+calculateArea() : double* *+calculateCircumference() : double*

```
public class Circle
{
    private double radius;
    public static final double PI = 3.1416;




}
```

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ONCAMPUS LAB (ALL): CHECK SCHEDULED SLOT ON TIMETABLE

EMERGENCY ONLINE LAB (ONLY WITH COURSE LEADER PERMISSION): VIA TEAMS SITE, TUE 4-6

DO: Lab 9 Tasks

FOLLOW: Lab 9 instruction slides

JDoodle (a web-based Java IDE)

Open the lab 9 tasks/instruction slides

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a) **Toggle to the Advanced Java IDE this week.**

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b) In the default MyClass program provided, delete the default code in the main method and rename the class name to CircleTester

/MyClass.java

```
1  public class CircleTester
2  {
3      public static void main(String args[])
4      {
5          |
6      }
7  }
```

Now change the name of the file

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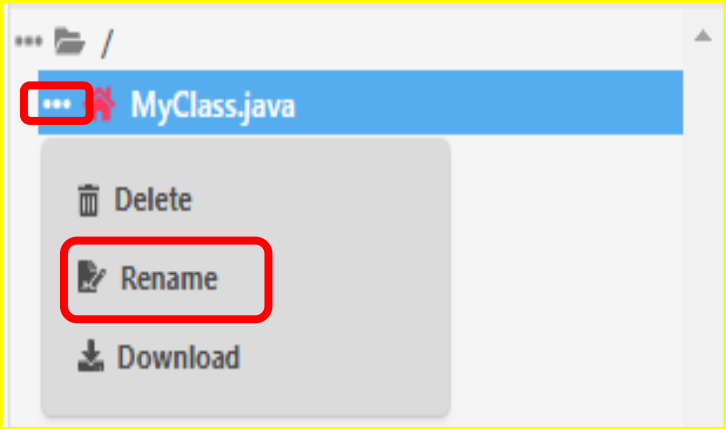
c) Select the 3 dots by the name of the MyClass file and select the Rename option



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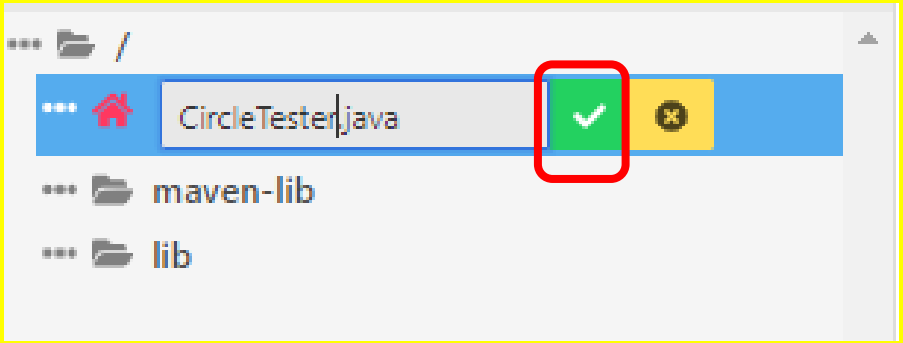
d) Change the name to CircleTester and click the tick:



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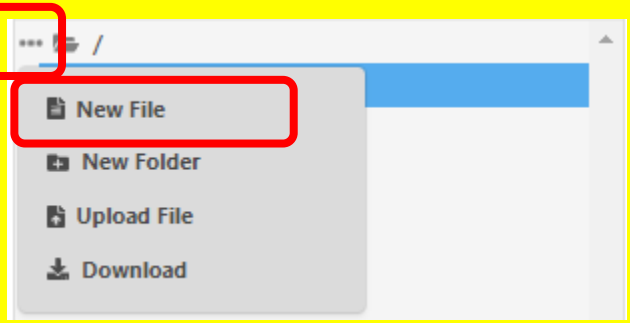
e) You will also need to create a second file (the Circle class) So select the 3 dots by the Main Folder icon and choose New File



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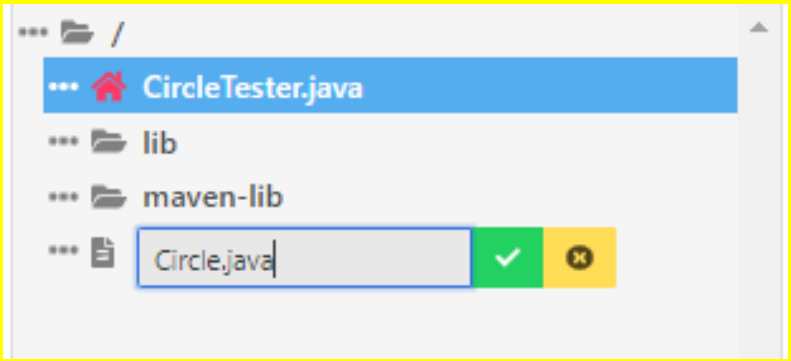
f) Name the new file Circle.java



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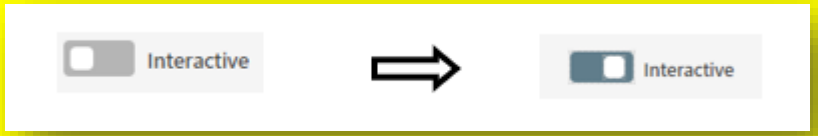
To allow for user input slide the Interactive slider to the on position.



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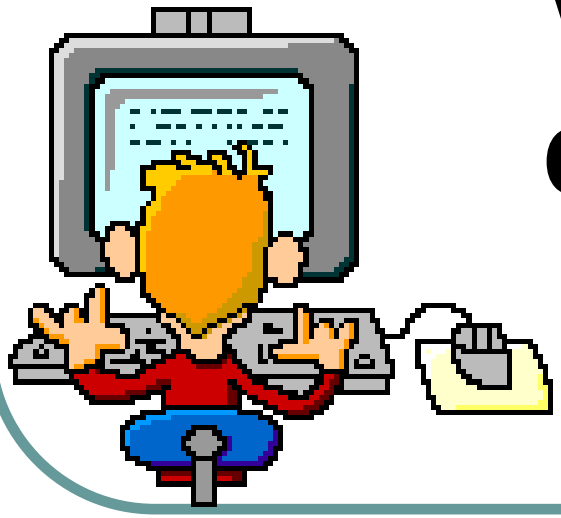
NOW – let's tackle this week's practical class.



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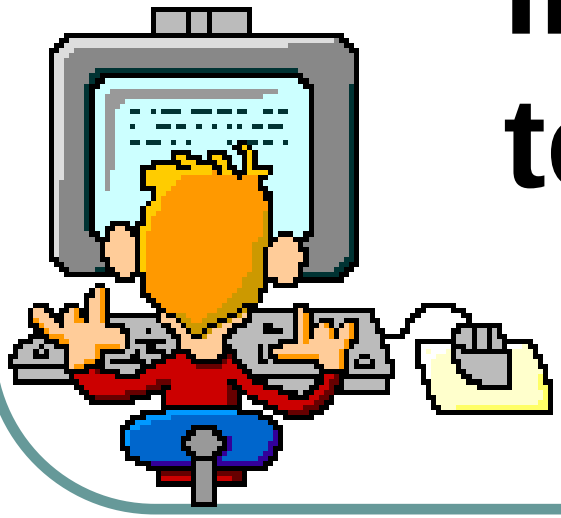
For this week's task we will implement and test a Circle class.



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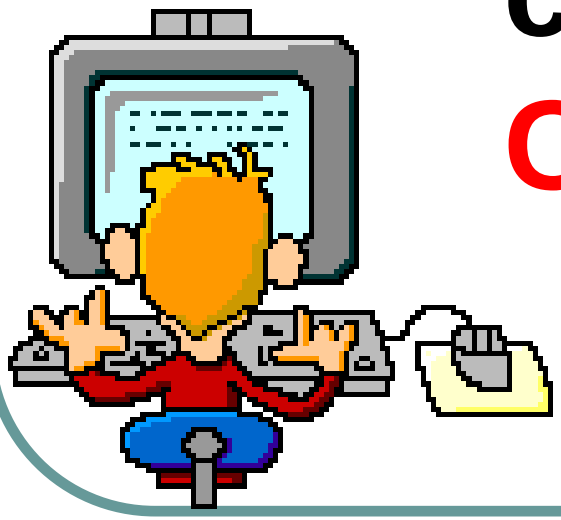
We will write two classes, the Circle class and a CircleTester class.



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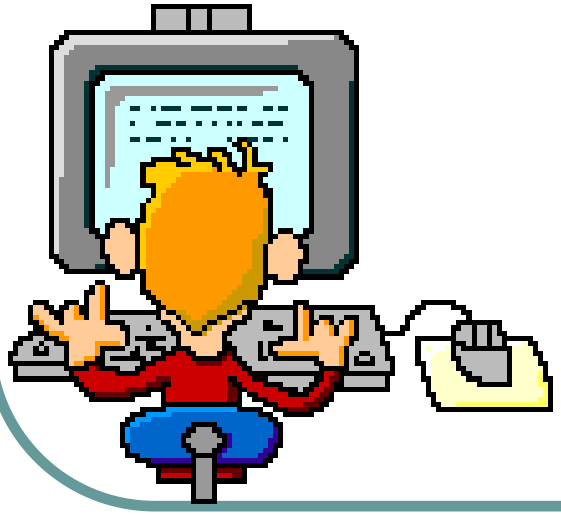
Let's start with the Circle class.



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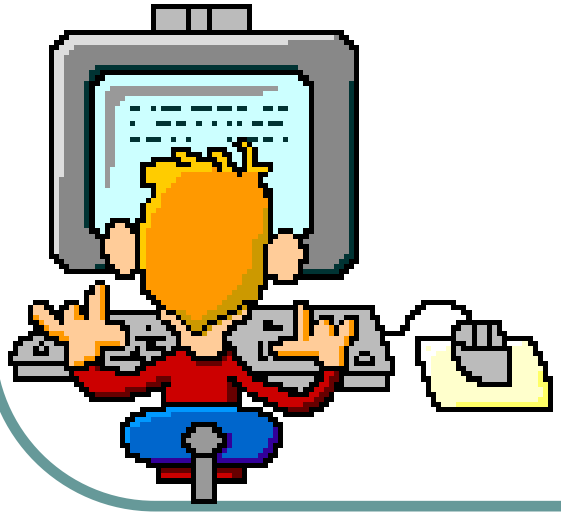

Circle
-radius : double   ***+PI: double= 3.1416***
+Circle(double)   ***+setRadius(double)***   ***+getRadius( ) : double***   ***+calculateArea() : double***   ***+calculateCircumference() : double***

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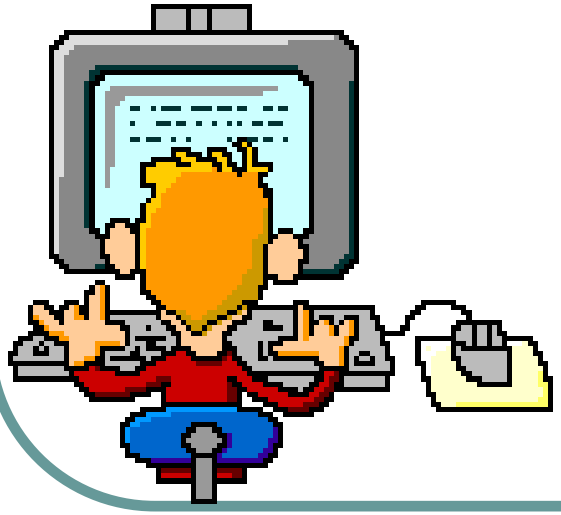
Notice this is a class constant

Circle
-radius : double
+PI: double= 3.1416
+Circle(double)
+setRadius(double)
+getRadius( ) : double
+calculateArea() : double
+calculateCircumference() : double



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a) **Implement the attributes of the Circle class.**

Remember: as this class does not contain a main method you cannot run it, you can just check it has no compiler errors.

Circle
-radius : double *+PI: double= 3.1416*

YOU HAVE 5 MINUTES!!!

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TIME'S UP!!

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b) Add code into the CircleTester program to print the value of PI using the class constant.

YOU HAVE 5 MINUTES!!!

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TIME'S UP!!

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g) Go back to your **Circle** class and add the **constructor** and **getRadius** methods.

Circle
-radius : double
+PI: double= 3.1416
+Circle(double)
+getRadius( ) : double

YOU HAVE 10 MINUTES!!!

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TIME'S UP!!

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c) Add code in the CircleTester program to create a Circle object, c1, with a radius of 4.5. Then use the getRadius method to display this radius.

YOU HAVE 5 MINUTES!!!

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TIME'S UP!!

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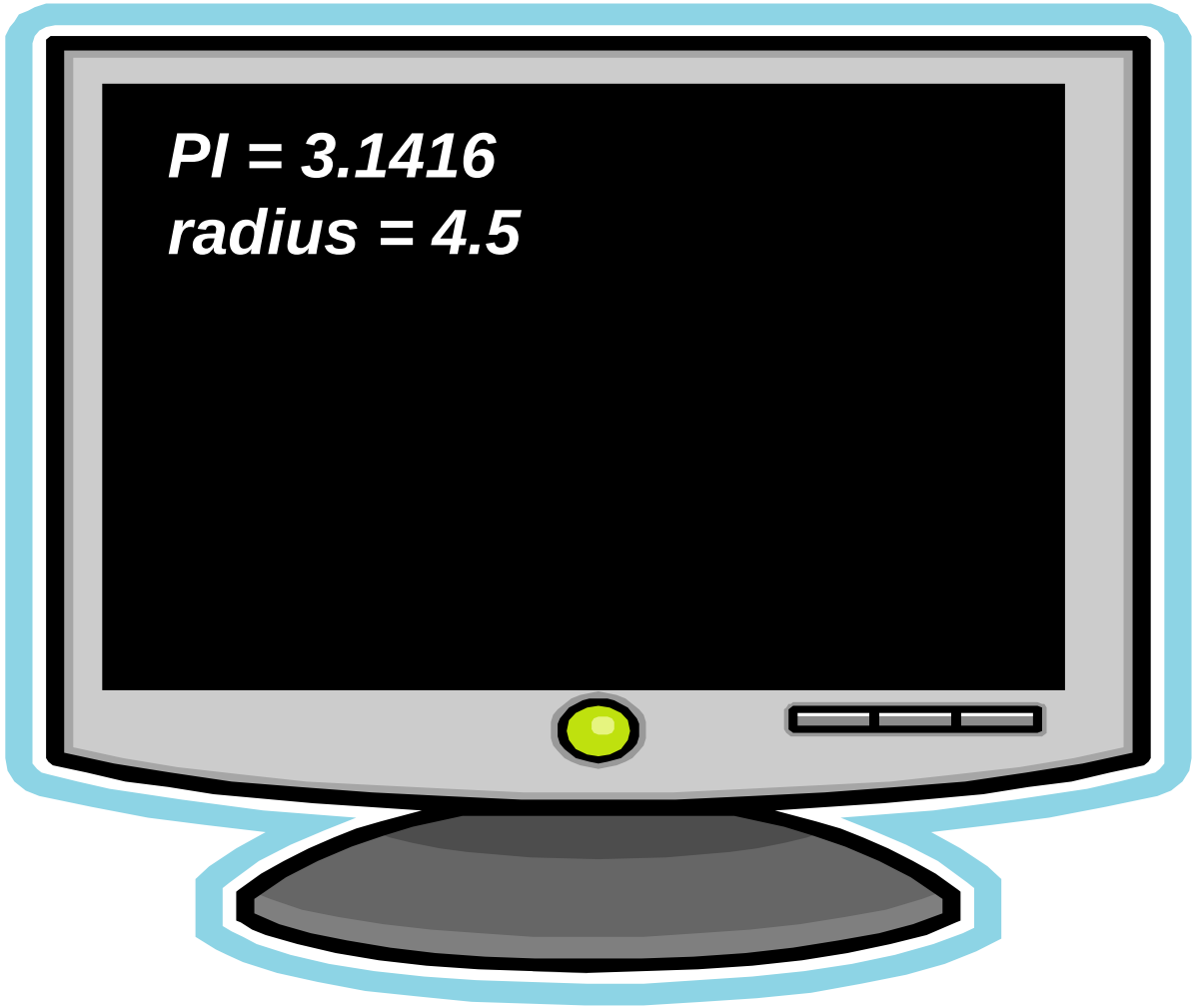

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d) Complete the code for the Circle class by implementing the setRadius, calculateArea and calculateCircumference methods.

Circle
-radius : double *+PI: double= 3.1416*
+Circle(double) *+setRadius(double)* *+getRadius( ) : double* *+calculateArea() : double* *+calculateCircumference() : double*

YOU HAVE 15 MINUTES!!!

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TIME'S UP!!

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e) Modify the CircleTester class to display the area and circumference of the c1 Circle object...

YOU HAVE 5 MINUTES!!!

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TIME'S UP!!

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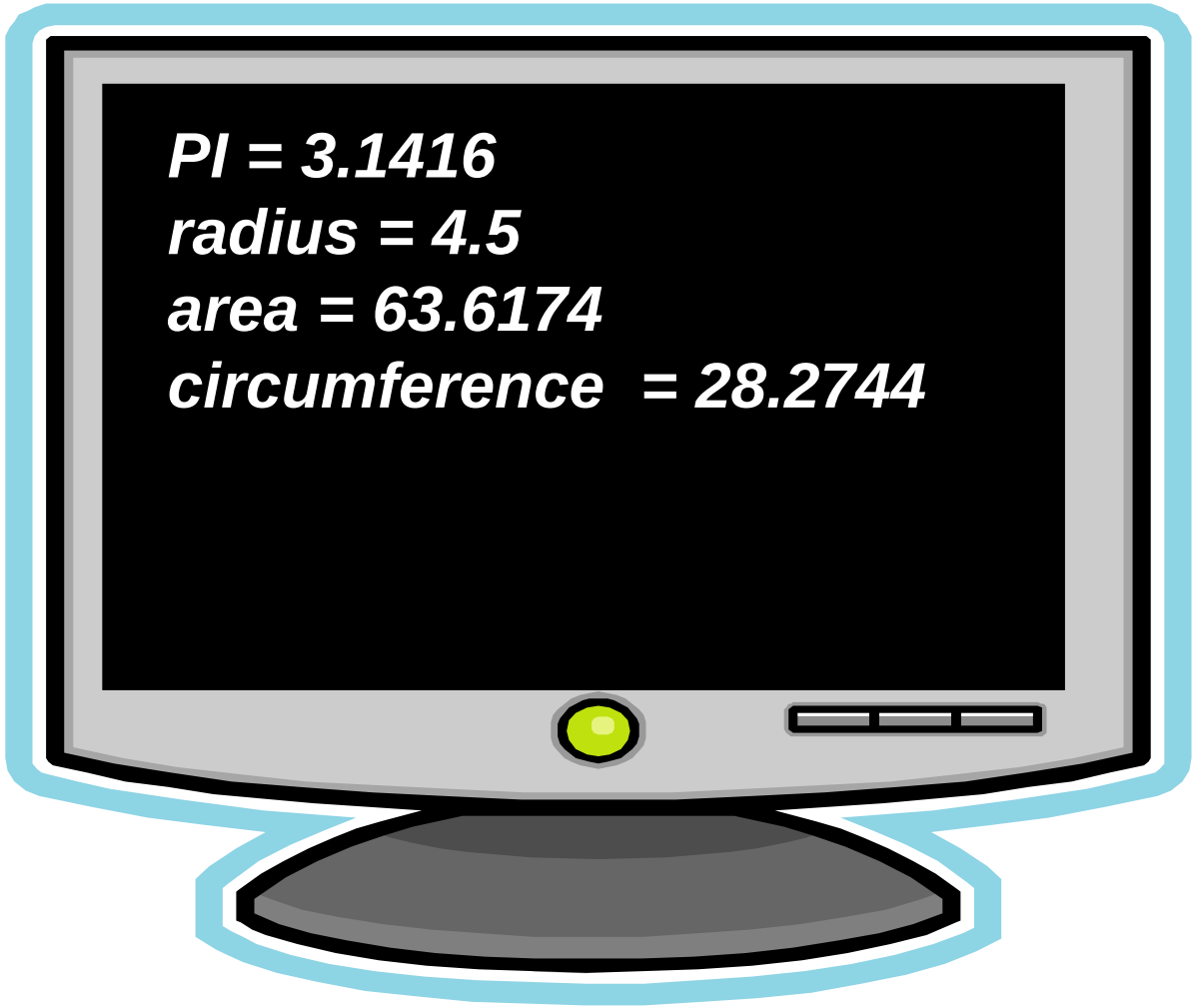

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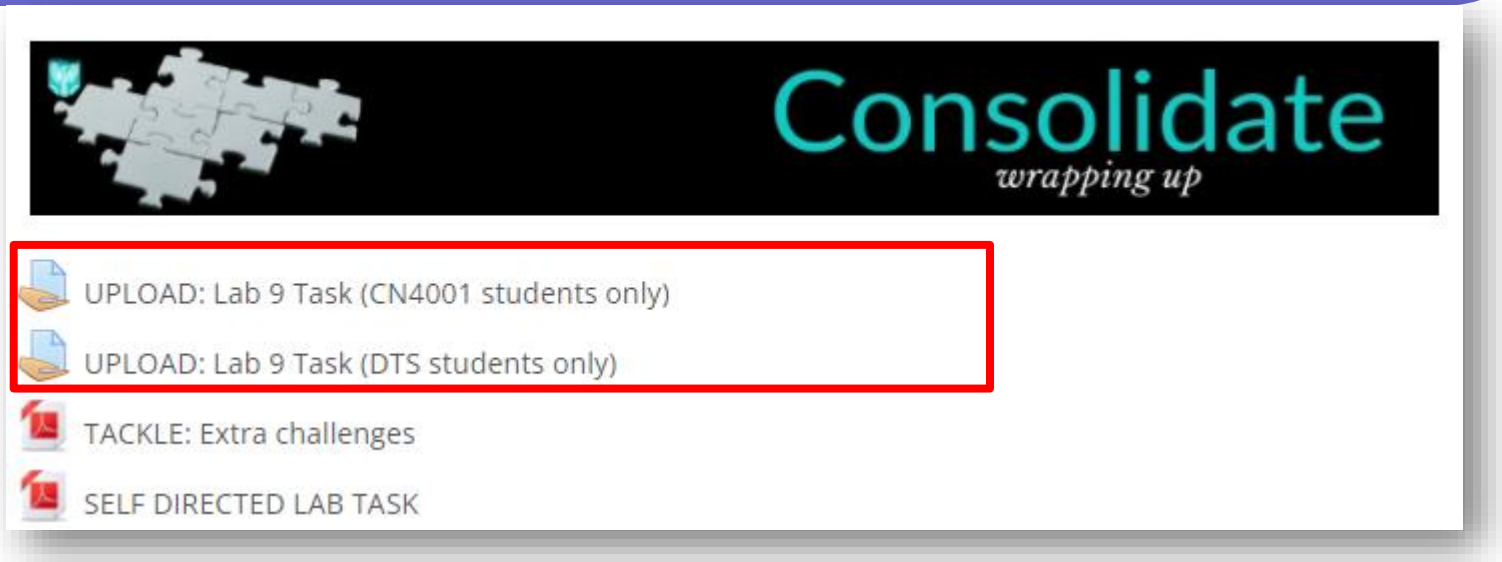

Download from JDoddle then Upload both the Circle.java and CircleTester.java files to Moodle via the appropriate submission link.

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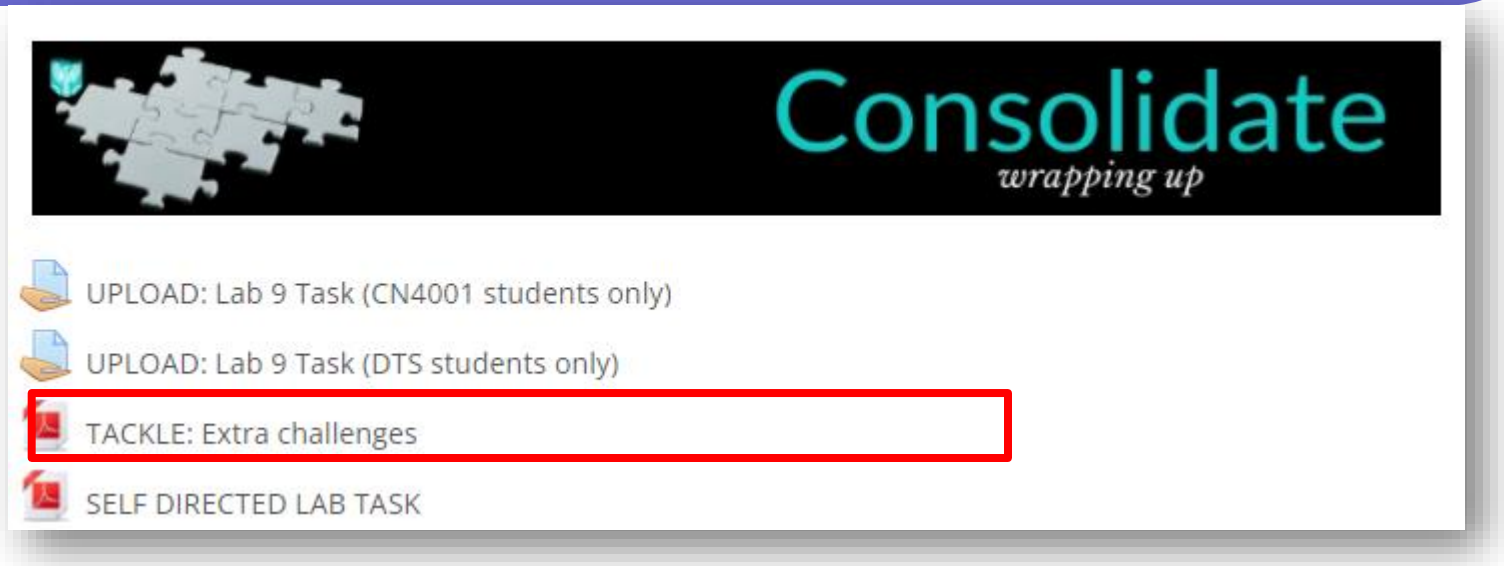

Spend the rest of the time in this practical working on the extra challenges.

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A final Self-Directed Practical Task (worth 18 marks) is also available for you to start now.