# CPSC 1110 – LAB 7

Recursion

**Starter Task: Problem E13:11**, Using Recursion, write a program to compute the sum of all values in an array.

**Second Task**:

Also, in this lab we will implement a program that approximates the square root of a given number using recursion. This is problem **E13.13** from the book. **PLEASE COMMENT YOUR CODE.** You will have points taken off if you do not comment your code. You can see sample comments in my starter code for how you should comment your code. Keep your code neat.

Add your .java file and a pdf containing a screenshot of your output to a single .zip file to submit to UTC Learn.

**Some useful links:**

BlueJ tutorial [www.bluej.org/tutorial/tutorial-201.pdf](http://www.bluej.org/tutorial/tutorial-201.pdf)

Java tutorial home page: <http://docs.oracle.com/javase/tutorial/>

Start here: <http://docs.oracle.com/javase/tutorial/java/index.html>

Arrays <http://docs.oracle.com/javase/tutorial/java/nutsandbolts/arrays.html>

Array Lists <http://docs.oracle.com/javase/7/docs/api/java/util/ArrayList.html>

**Some helpful tips:**

1. Compile often – do it.
2. Break up the problem into two tasks initially, your base case and then your recursive case. The base case will be much less code than the recursive case.
3. There is very limited starter code for this lab. Then again, there is not a lot of code to write to complete this lab.

## Tasks: Follow the directions below to complete your lab assignment

For today's lab we will be completing **Exercise E13.13** from the book. Starter code is included on UTC Learn – SquareRootComputer.java.

**E13.13 –** The following method was known to the ancient Greeks for computing square roots. Given a value x > 0, and a guess g for the square root, a better guess is (g + x/g)/2. Write a recursive helper method private static squareRootGuess(double x, double g). If g2 is approximately equal to x (that is, less than **.0001** difference between x and g2), return g, otherwise, return squareRootGuess with the better guess. Then write a method public static squareRoot(double x) that uses the helper method.

Here is a sample run from a working project:

Enter a number: 27

The square root is of 27.000 is 5.19615

Expected value: 5.19615

***IMPORTANT!!*** Follow the name conventions shown in the lab documentation. For this lab you will simply need to complete the two methods described above private static squareRootGuess(double x, double g) and public static squareRoot(double x).

## To Turn In via UTC Learn

You should turn in 1 .ZIP file containing your java files and a pdf with a0020screen shot of your output. 1 file should be uploaded to UTC Learn. ***IMPORTANT!!!*** You should name your file in the following manner. lastname-firstname-lab07.zip. So John Smith would submit smith-john-lab07.zip.