HOMEWORK 4

CS 125

due at 11:45am (classtime) on Tuesday, September 8

Write a Python *function* to solve each of the following problems. You may either compose and test your solutions in the ActiveCode boxes on the Runestone site, or using Python installed locally on your computer.

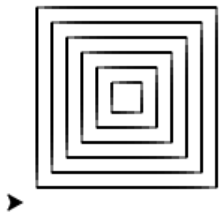
When you have finished your solutions, copy and paste all of them into a single Python file (or text document). Use comments (lines that begin with a `#` symbol) to clearly state the problem number for each solution in your file. Save your file and upload it to the Homework 4 assignment on Moodle.

1. **Inches to centimeters:** Write a function `inchToCM(inches)` that converts inches to centimeters and returns the result. One inch is 2.54 centimeters.
2. **Volume of a sphere:** Write a function `sphereVol(radius)` that returns the volume of a sphere whose radius is given by the `radius` parameter. The formula for the volume of a sphere with radius r is $\frac{4}{3}\pi r^3$.
3. **Approximating square roots:** Write a function `mySqrt(n,k)` that approximates $\sqrt{n}$ using k iterations of Newton's algorithm. Newton's algorithm is an iterative method where the initial approximation is $\frac{n}{2}$ and each successive approximation is computed using the formula

   $$\text{newguess} = \frac{1}{2}\left(\text{oldguess} + \frac{n}{\text{oldguess}}\right)$$

   Your function should compute k iterations of Newton's method and return the result.

4. **Nested Squares:** Write a function `nestedSquares(n)` that draws n nested squares. For example, the following diagram shows six nested squres:

   You may choose to have your function call the `drawSquare` function given in Chapter 6 of the text.