CSCI 2500 — Computer Organization
Lab 01 (document version 1.0)

- This lab is due by the end of your lab session on Wednesday, September 5, 2018.
- This lab is to be completed **individually**. Do not share your code with anyone else.
- You **must** show your code and your solutions to a TA or mentor to receive credit for each checkpoint.
- Labs are available by 6:00PM on Mondays before your lab sessions. Plan to start each lab early and ask questions during office hours, in the discussion forum on Submitty, and during your lab session.

1. **Checkpoint 1:** Write a program that asks the user for a positive odd integer n, then builds a *triangle* as shown in the example below. Implement this using nested `for` loops.

   ```
   What is n? 7
      *
     ***
    *****
   *******
   ```

   If you did not do so in the first place, write a function to build this triangle. To stop program execution, use `-1` as the sentinel value to end the program (and let the user know this). Next, write another function to accomplish the same results, but use `printf()` to achieve the formatting and at most one loop.

   Given the previous problem, you next will have your program calculate the area of each triangle. Assume the triangle is an isosceles triangle with the given base of length n and a height equal to the number of rows used to build the triangle. Use `printf()` to display exactly **two digits** of precision.

2. **Checkpoint 2:** The Fibonacci sequence is calculated recursively by summing the previous two values of the sequence, i.e., `fib(n)=fib(n-1)+fib(n-2)`. Assume that this sequence starts with `0` and `1` as its first two elements.

   Write a program (using `long` and not `int` for `fib`) that asks the user for a non-negative integer, then computes its Fibonacci number using a recursive function.

   Run your program on larger and larger numbers. Does it take a long time to compute? Is there any way to speed this computation up and keep the recursion? Can you speed this computation up by removing the recursion?