CS 3035, Fall 2022
In-Lab Exercise 6

Due: September 9, 2022 (11:59 AM noon)

The following programming exercise has two parts. Parts 1 is compulsory for everyone and part 2 is optional for those who might want to attempt it. Please submit a zip/tar compressed file containing the following:

1. Your program for Parts 1 (and Part 2 if you attempted it). Both text file (.txt) or a C program file (.c) are acceptable.
2. A file with screenshot of your outputs for each part and the **observations for Part 1**. Please submit this file as a PDF.

Part 1: Fibonacci series

The Fibonacci series 0, 1, 1, 2, 3, 5, 8, 13, 21, ... begins with the terms 0 and 1 and has the property that each succeeding term is the sum of the two preceding terms.

A. Write a ***nonrecursive*** function fibonacci (n) that calculates the Fibonacci series up to the n^{th} number.

B. State your observations for the following questions:

   a. If you use an integer data type for n, what is the largest number that can be printed without error by on your system? What type of error do you get when the largest number is reached?

   b. If you use an unsigned long long int as the data type for n, what is the largest number that can be printed by fibonacci (n) on your system? Is this value different from part (a) and why?

Example program output for n = 10:

0 1 1 2 3 5 8 13 21 34

Part 2: Fibonacci triangle

Another representation of the Fibonacci series is as a triangle. For example, the following represents the Fibonacci triangle for n = 10. Write a second function fibonacciTriangle(n) that prints the fibonacci series in this form.

```
0
0 1
0 1 1
0 1 1 2
0 1 1 2 3
0 1 1 2 3 5
0 1 1 2 3 5 8
0 1 1 2 3 5 8 13
0 1 1 2 3 5 8 13 21
0 1 1 2 3 5 8 13 21 34
```