SE 282: Software Engineering Theory
Assignment 2

submission is through Canvas

1. Given two positive integers A and B, write a program to calculate the **greatest common divisor (GCD)** of the **sum of the first A Fibonacci numbers** and the **sum of the first B Fibonacci numbers**. The program can be in either C or Java.

Input:

- Two positive integers A and B.

Output:

- The GCD of the sum of the first A Fibonacci numbers and the sum of the first B Fibonacci numbers.

Example:

Input:

```
A = 4, B = 3
```

Fibonacci series:

```
0, 1, 1, 2, 3, 5, 8, 13, ...
```

Sum of the first A Fibonacci numbers:

```
0 + 1 + 1 + 2 = 4
```

Sum of the first B Fibonacci numbers:

```
0 + 1 + 1 = 2
```

$\text{GCD}(4, 2) = 2$

Constraints:

- The solution should not rely on precomputed Fibonacci numbers.
- Think about better approaches than brute-force computing the Fibonacci series up to A and B.

Hints:

(a) Consider the properties of the Fibonacci series and how it relates to the Euclidean Algorithm.

(b) Think about how you can efficiently compute the sum of the first A and B Fibonacci numbers without explicitly generating the entire series.

Remember, part of the challenge lies in finding a reasonably elegant and efficient solution.

2. Add suitable output commands to the GCD algorithm that show the progress of the algorithm.

3. Add suitable comment to your code that would help a code reviewer.

4. Provide a readme file that explains your solution to a reader with sample output similar to the output shown in the question above and contains other instructions i.e. how to compile and run the program.

5. Test your code and document this. Introduce, if useful, bounds for the input.