

# Mystery Readme

## Design

I figured out what mystery.s did by going through the assembly and writing out the registers and ebp memory locations. There were 3 functions: add, dothething, and main. Add was just simple addition of two variables. Line 10 gave away what the dothething function actually was. I saw there was double recursion and found out it was  $\text{dothething}(a-1) + \text{dothething}(a-2)$ . This directly correlates to finding the nth Fibonacci number. Later I found out num was actually an array and put the pieces together. I think I may be missing some pieces, but my program works. Because the input is a 32-bit integer overflow occurs when the user enters a number greater than 46.

## Compiler Optimization

It seems the compiler reused registers more often in the optimized version. Therefore its memory use was more efficient allowing for the program to run faster.