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Programming Assignment #3 - Mystery function

Design

After tracing the registers for a few values and running the given assembly program using different inputs, I determined that this code calculated the n^{th} term (where n is the given command line input) in the Fibonacci sequence.

Since Fibonacci is recursive, I decided to use a recursive function to find the n^{th} term.

Implementation

After checking for valid input according to the assignment specifications (i.e. 1 <= n <= 20), the mystery function is called.
The function runs through an iterative loop to find the n^{th} term.
Two assignments in the loop (after the sum) shift the values over in preparation for the next iteration.

Challenges

The most challenging part of this assignment was finding what the Assembly code was actually calculating. Once determined, all that was needed was to write a function to find the n^{th} term.

Analysis

The running time of the Fibonacci function is 4n (using each line to calculate a sum for the running time). This function will not use a lot of memory because it is not recursive and is only using four variables. The loop can only run from 3 to 20 (assuming the maximum input is 20, per the assignment description).