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Reading x86 Assembly Code
(mystery.c)

Design

This program takes in one non-negative integer parameter. First of all the program runs an error check to ensure the correct number of arguments. It then converts the given string arguments into an integer. After that, the programs initializes an array of size 200 to the value of -1. The program than calls the fibonacci function to calculate the resulting value.

The fibonacci function takes in one parameter, which the n-th Fibonacci number and returns the value of that n-th Fibonacci function. Another function called add is called by the fibonacci function during the recursive call to add two digits.

Challenges

- Understanding and decoding the given assembly code
- Figuring out the optimization

Optimization

The optimization was possible because the compiler knows ahead of time how many variable are going be used and how they will be used. And according to that, it uses minimal registers and also reuses them. Another possibility is that the compiler reuses the already computed results and stores them somewhere for later use instead of doing the calculations all over again.