

mysFunc Readme
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mysFunc is a program which takes an integer input ranging from 1 to 20 and prints an integer. The relation between the input and output numbers is that the output number represents the i th value of the Fibonacci sequence (where i indicates the input value).

When designing my mystery.c file, I needed to ensure that the file functionally worked the same as the mystery.s file provided by the assignment. Outputting the i th number in the Fibonacci sequence could have been accomplished with at least two ways: recursion or iterative looping. While recursion may work well for small input values (probably would have been ok for the given range of 1-20), I wanted to ensure my program not only had scalability but also had as best big O values as possible. Therefore, I used the iterative method. The iterative method runs in $O(n)$ time and uses $O(1)$ space. The iterative method simply returns 1 if the input value is 1 or 2. If the input value is 3 or greater, the iteration runs with 3 integer values: result, f1, and f2 which are all initialized to 1. On each iteration, result is updated to be the sum of f1 and f2. Next, f1 is set equal to f2 and f2 is then set equal to the result. This allows for the next iteration of the loop to be correctly calculated. After the loop has been completed, the function returns the integer result to the mysFunc.c file.

Fortunately, I ran into absolutely no implementation challenges when working on this project. By testing values with the given .s file, I was quickly able to determine the relationship between the input and output values. The only “challenge” I had was the decision of using either recursion or iterative looping, which I described above.