CSCI 2525 *Assignment 3*

Create the two programs described below. Upload them to Canvas prior to the due date.

1. ***reorder.asm***

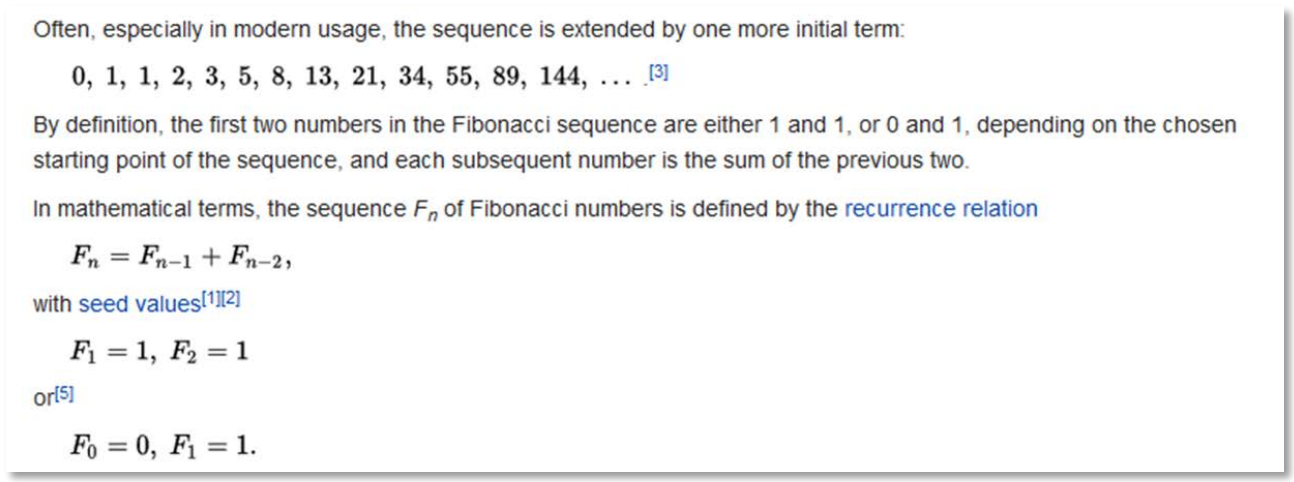
- rearranges the values of the following array into the order shown. Use only MOV and XCHG to accomplish the desired result. **DO NOT use any immediate values**. Use only direct offset addressing to accomplish the goal. Be as efficient as you can. Note: You will have to look at memory to see if you have achieved your goal. You may not create other data elements to assist with this problem.

Original Array: arrayD DWORD 32, 51, 12
Ending Array: arrayD DWORD 12, 32, 51

2. ***fibonacci.asm***

- computes the following.

   a. **Compute** *fib*(*n*) for *n* = 2, 3, …, 10 using an array, of the appropriate size and type. If you so desire, you may declare a value for fib(0) and fib(1). However, all computation of the remaining elements of the array must be done by your program, **no use of immediate values is allowed**. In other words, you must use the formula shown below (figure 1) to determine the values of the remainder of the required elements. **Do not declare an array pre-filled with ALL the required elements.**
   b. After your array is filled with required values, store *fib*(3) through *fib*(6) in consecutive bytes of the ebx register starting from the lowest byte; that is, *fib*(3) is stored in the low byte (bl) of ebx, *fib*(4) is stored in the next byte (bh), *fib*(5) is stored in the next byte of ebx and *fib*(6) is stored in the highest byte.
      i. EBX register will look like this **08050302**


Often, especially in modern usage, the sequence is extended by one more initial term:

$$0,\ 1,\ 1,\ 2,\ 3,\ 5,\ 8,\ 13,\ 21,\ 34,\ 55,\ 89,\ 144,\ \ldots$$ [3]

By definition, the first two numbers in the Fibonacci sequence are either 1 and 1, or 0 and 1, depending on the chosen starting point of the sequence, and each subsequent number is the sum of the previous two.

In mathematical terms, the sequence F_n of Fibonacci numbers is defined by the recurrence relation

$$F_n = F_{n-1} + F_{n-2},$$

with seed values[1][2]

$$F_1 = 1,\ F_2 = 1$$

or[5]

$$F_0 = 0,\ F_1 = 1.$$

Figure 1: Information on the Fibonnaci sequence

Notes for Fibonacci.asm

1. Assume fib(0)=0, fib(1)=1.
2. You may use any instruction/directive/operator through chapter 4 pg 128, including any of the arithmetic operators +, *, /, -.
3. Your program must use indirect operands in some way as discussed in chapter 4.

Specifications for Entire Assignment

1. Your program must make calls to DumpRegs as necessary.
2. If you use immediate values for any portion of this assignment (except where specifically allowed), you will receive a zero for that portion of the assignment.

    Example: mov ebx, 08050302 ;// This is NOT ALLOWED

3. Part of the program will be graded based on program style. I reserve the right to judge style as I deem fit for the assignment.

    This includes commenting, whitespace, use of the required header, etc