

# Plan 7

October 16 – October 23

- Read Chapter 8 in the textbook.
- Read Chapter 4 in “Programming from the Ground Up”  
(available via the web page of the course).
- **Exercise 14** (Challenging)  
Solve the exercise on the next pages.

**Exercise 14** The Fibonacci numbers are the following sequence of numbers:

0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, ...

By definition, the first two Fibonacci numbers are 0 and 1, and each remaining number is the sum of the previous two. A C function for computing the  $n$ th Fibonacci number is shown below.

```
int fib(int n) {
    int prev = 0, cur = 1, result = 0, i;
    for (i = 1; i <= n; i++) {
        result += prev;
        prev = cur;
        cur = result;
    }
    return result;
}
```

- (a) Implement this function in x86 assembly language. Comment your code.
- (b) The  $n$ th Fibonacci number may also be computed by the following recursive C function:

```
int fib(int n) {  
    return n <= 2 ? n - 1 : fib(n - 1) + fib(n - 2);  
}
```

Implement this function in x86 assembly language. Comment your code.