

# Assignment 5 -- CSE231/506, Fall 2014

Due: 11:55 PM November 20 Thursday, 2014

## Chapter 03

- 29. Create a `toString` method for the `ArrayStack` class. This method should create and return a string that correctly represents the current stack. Such a method could prove useful for testing and debugging the `ArrayStack` class and for testing and debugging applications that use the `ArrayStack` class.
- 42. Create a `toString` method for the `LinkedStack` class. This method should create and return a string that correctly represents the current stack. Such a method could prove useful for testing and debugging the `LinkedStack` class and for testing and debugging applications that use the `LinkedStack` class.

## Chapter 04

10. The Fibonacci sequence is the series of integers

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

See the pattern? Each element in the series is the sum of the preceding two elements. Here is a recursive formula for calculating the  $n$ th number of the sequence:




$$\text{Fib}(N) = \begin{cases} N, & \text{if } N = 0 \text{ or } 1 \\ \text{Fib}(N-2) + \text{Fib}(N-1), & \text{if } N > 1 \end{cases}$$

- a. Write a recursive method `fibonacci` that returns the  $n$ th Fibonacci number when passed the argument `n`.
- b. Write a nonrecursive version of the method `fibonacci`.
- c. Write a driver to test your two versions of the method `fibonacci`.
- d. Compare the recursive and iterative versions for efficiency. (Use words, not Big-O notation.)

Note: for the nonrecursive version of `fibonacci`, you do not need to use either of the two approaches we discussed during the class (tail-recursion or stack-based approach).

- 12. Change the Towers of Hanoi program so that it does the following:
  - a. Prints out only the number of ring moves needed to solve the problem. Use a static variable `count` of type `int` to hold the number of moves.
  - b. Repeatedly prompts the user for the number of rings and reports the results, until the user enters a number less than 0.

## Chapter 05

-   17. Create an interactive test driver for the `ArrayBndQueue` class. See Section 2.4, “Software Testing” for information about interactive test drivers.
-  32. Consider a `toString` method for a queue that would create and return a string that nicely represents the current queue. Assume each enqueued object already provides its own reasonable `toString` method that you can invoke from the queue’s `toString` method. Design, code, and test a `toString` method for the `LinkedUnbndQueue` class.