

CSC 112 Homework 1 - Recursion Name _____

Due Date: Start of class, 10/7/2009

1. For the following problem descriptions, suggest the appropriate base case condition(s) and why those are the appropriate conditions:

- a) A recursive function that computes the logical OR over a size n array of Boolean values
- b) A recursive function that, given an array and a set of indices x and y such that x is less than y and both are less than the size of the array, reverses all array entries between x and y . [Problem 3 on page 606 of book]
- c) A recursive function that checks for whether or not a word is a palindrome by checking whether or not the first and last letters are the same, returning false if they aren't the same, and recursively testing the rest of the word (minus the front and back letter) if they are.

2. Below you will find an implementation of a recursive technique for generating the n th value of the Fibonacci sequence, which are the numbers such that $F_n = F_{n-1} + F_{n-2}$ (1, 1, 2, 3, 5, 8, 13, 21, 34...).

```
int fibonacci(int n)
{
    if ((n == 0) || (n == 1)) return 1;
    else return fibonacci(n-1) + fibonacci(n-2);
}
```

While this is an very simple-looking function to read and write, I claim it is not a very efficient function in terms of amount of work that is performed. Indicate whether you believe with me or not and why.

3. Demonstrate the correctness of the factorial method outlined in class using the “three-checks” verification method described in class.

4. Write a recursive method that computes the logical OR over an array of Booleans