

These are questions to test your understanding of the material. Some of these questions may appear on an exam.

1. Using the definition given for Fibonacci function, write a recursive function to compute $F(n)$.
2. Rewrite the function you wrote in 1 as a tail-recursive function.
3. Rewrite the tail-recursive function you wrote in 2 as an iterative function.
4. What is the run-time efficiency (big Oh) for each of the functions you wrote?
5. Write a recursive function to compute the number of leaf nodes in a binary tree.
6. Give the definitions for the linear recursion, tree recursion, and the tail recursion.
7. What is wrong with the following recursive code that attempts to compute $n!$

```
int Factorial(int x) {  
    if (x == 0) return 1;  
    return x* (x-1) * Factorial(x -2);  
}
```