

CSE 30
Spring 2021
Quiz 1

Solutions

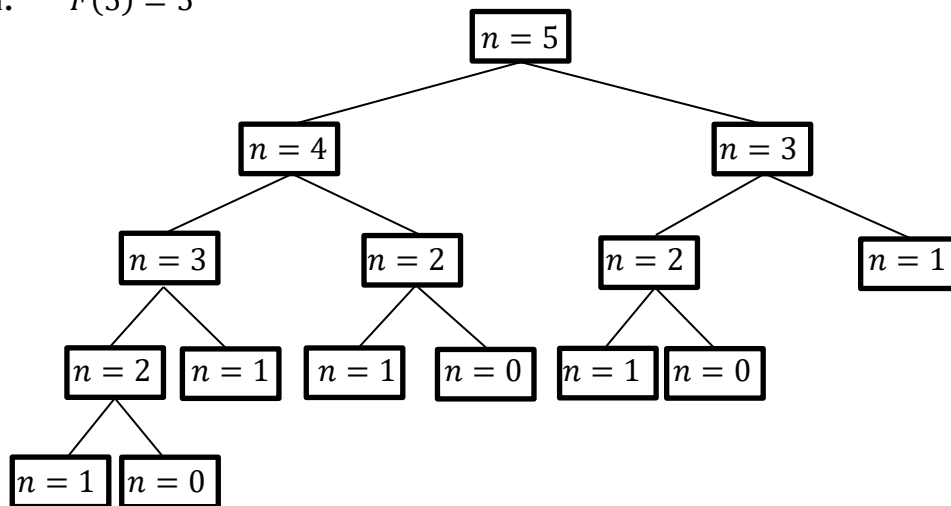
1. (30 Points) The Fibonacci function $F(n)$ is defined by $F(0) = 0$, $F(1) = 1$ and the recurrence formula $F(n) = F(n - 1) + F(n - 2)$ for $n \geq 2$.

a. (20 Points) Write a recursive Python function that returns the value $F(n)$.

```
def F(n):  
    # begin solution  
  
    if n==0:  
        return 0  
    elif n==1:  
        return 1  
    else:  
        return F(n-1)+F(n-2)  
  
    # end solution
```

b. (10 Points) Perform a box trace of the function call $F(5)$. Each box should state the value of n for that recursive invocation. What integer is returned?

Solution: $F(5) = 5$



2. (20 Points) Write a recursive Python function called $\text{Sum}(n, m)$ that returns the sum of the integers from n to m (inclusive) if $n \leq m$, and returns 0 if $n > m$. Do this by emulating the algorithm for the factorial function discussed in class: first determine the sum of the integers from n to $m - 1$ recursively, then add m to the result.

```
def Sum(n, m):  
  
    # begin solution  
  
    if n>m:  
        return 0  
    else:  
        return Sum(n, m-1) + m  
  
    # end solution
```