**Question 2**. Proof by Induction

Let F(n) denote the nth Fibonacci number. Prove F(n) > (4/3)n for n > 4.

Hints:

(1) Use the strong induction

(2) Use the fact F(n) = F(n-1) + F(n-2)

(3) Since you are using two values, you must prove the two base cases: n = 5 and n = 6

**Answer:**  
1. Prove the statement is true with n = 5 and n = 6

* N = 5

F(5) = 5 > (4/3)5 = 1024/243

* N = 6  
  F(6) = 8 > (4/3)6 = 4096/729

2. F(n+1) = F(n) + F(n-1)

F(n) > (4/3)n for n is from [4..k)

If F(k) > (4/3)k then F(k-1) is also > (4/3)(k-1)

Then we will prove it is true with F(k+1)

F(k+1) = F(k) + F(k - 1)  
 = (4/3)k + (4/3)(k-1)

= (4/3)k \* (1 + (4/3)-1)

= (4/3)k \* (1 + (3/4))

= (4/3)k \* (7/4) > (4/3) k + 1 = (4/3)k \*(4/3)

= (7/4) > (4/3)