**Lab W1D1**

**Fibonacci Numbers**

**Question 2**

**A)**

**Prove F(n) > (4/3)^n for n > 4**

**n = 5**

**f(5) > (4/3) ^5 🡪 5 > 4.25 ----------- 🡪 True;**

**f(6) > (4/3) ^6 🡪 6 > 5.61 ----------- 🡪 True;**

**n = k f(k) > (4/3)^k --------- > True : our hypothesis**

**n = k +1 f (k + 1) > ( 4/3)^k+1**

**LHS 🡪 f (k + 1) = f(k) + f(k - 1) ------ > based on Fibonacci definition**

**LHS = (4/3)^ k + (4/3)^k-1**

**RHS = (4/3)k+1 then**

**( 4/3)^k + (4/3)^ k-1 > (4/3)^k+1**

**-------------------------------------------------------------------------------------------**

**B)**

**Prove F(n) is greater than ( m/ m-1) for some m and n ………..**

**F(n) > (2/1)^n 🡪 never exits**

**F(n) > (3/2)^n 🡪 n >= 11**

**F(n) > ( 4/3)^n 🡪 n >= 5**

**F(n) > (m/ m - 1) 🡪 n >= 3 m = 5,6,7………..**