**Problem 0**

**1.list out the the function call stack**

fib(5) -> fib(4) -> fib(3) -> fib(2) -> fib(1) -> fib(0)

fib(1) -> fib(0)

fib(2) -> fib(1) -> fib(0)

-> fib(0)

fib(3) -> fib(2) -> fib(1) -> fib(0)

fib(1) -> fib(0)

-> fib(1)

**2. Prove the time complexity of the algorithms.**

For the equation the time complexity will be

T(n)=T(n-1)+T(n-2)+1

For each value of n, the function makes two recursive calls with parameters n-1 and n-2. This branching continues until it reaches n = 0 or n = 1, at which the recursion stops. The number of function calls grows exponentially with the value of n because each function call results in two more functions O(2n)

**3. Comment on way's you could improve your implementation**

We can improve this by storing the values of fib(4), fib(3)……. Where these values can be reused instead of recalculation and calling all the below functions