CS222 - Algorithm Design

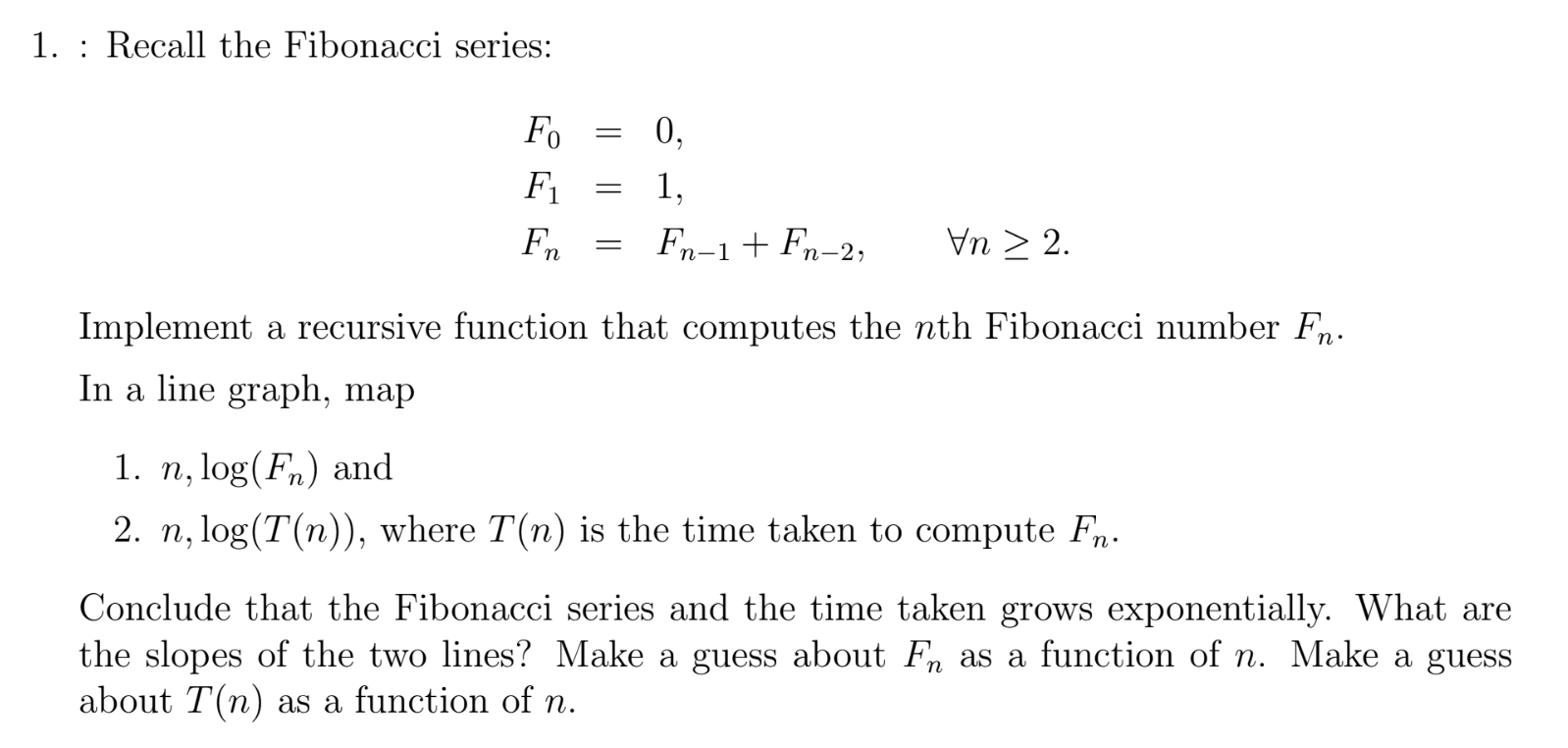
Dr. Arpita Korwar

# *Assignment – 2 : Fibonacci series using recursion*

Authors :

* Prakhar Mathur 1906328
* Sanjay Marreddi 1904119
* Rishabh Tripathi 1904129

*Problem Statement*



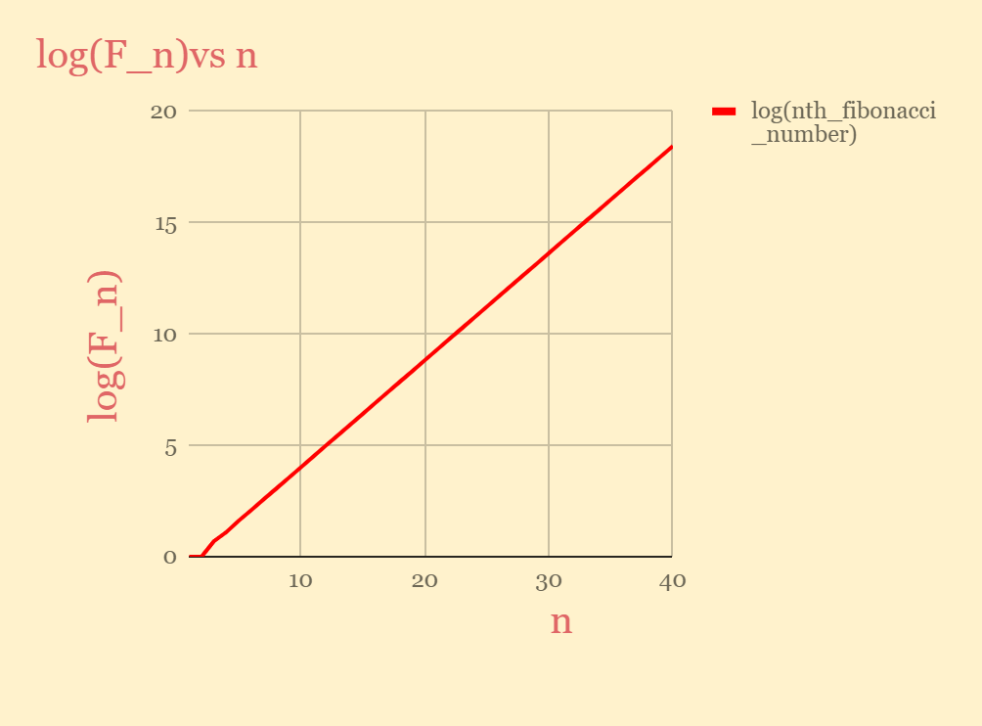
The values of obtained using our code are as follows:

A picture containing calendar

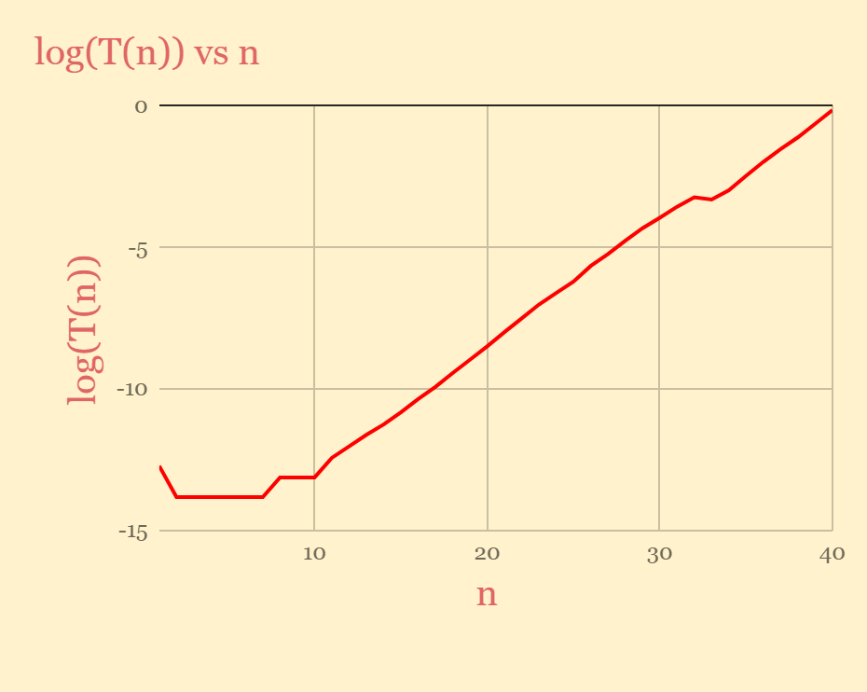
Description automatically generatedA picture containing text, crossword puzzle

Description automatically generated

Line graph of :



Line graph of :



The slopes of both the above graphs are almost **constant** i.e., **logarithms** of and are constant which implies that they are **exponential** in nature.

*So, we can conclude that the Fibonacci series and the time taken grows exponentially.*

The slopes of the two lines are as follows:

>

*Let us guess/compute the and* ***T(n****) as a function of n using above values:*

*Since we observed that slopes are constant,*

d(log())/dn = *constant* ()

∫d(log()) = ∫0.dn

log() = 0.**n** + **k** *( Integration constant)*

= e^(0.**n**+**k**)

= A\*(e^(0.**n**)) (*A is constant)*

*In the similar way, the function for T(n) will be of the form:*

= B\*(e^(0.**n**)) (*B is constant)*

--- The End ---