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Serie 3

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Ex.1

a) ~ 1

b) ~ 1

c) ~ 1

d) $\sim 2N^3$

e) ~ 1

f) ~ 2

Ex.2

a) $\sim 2N$

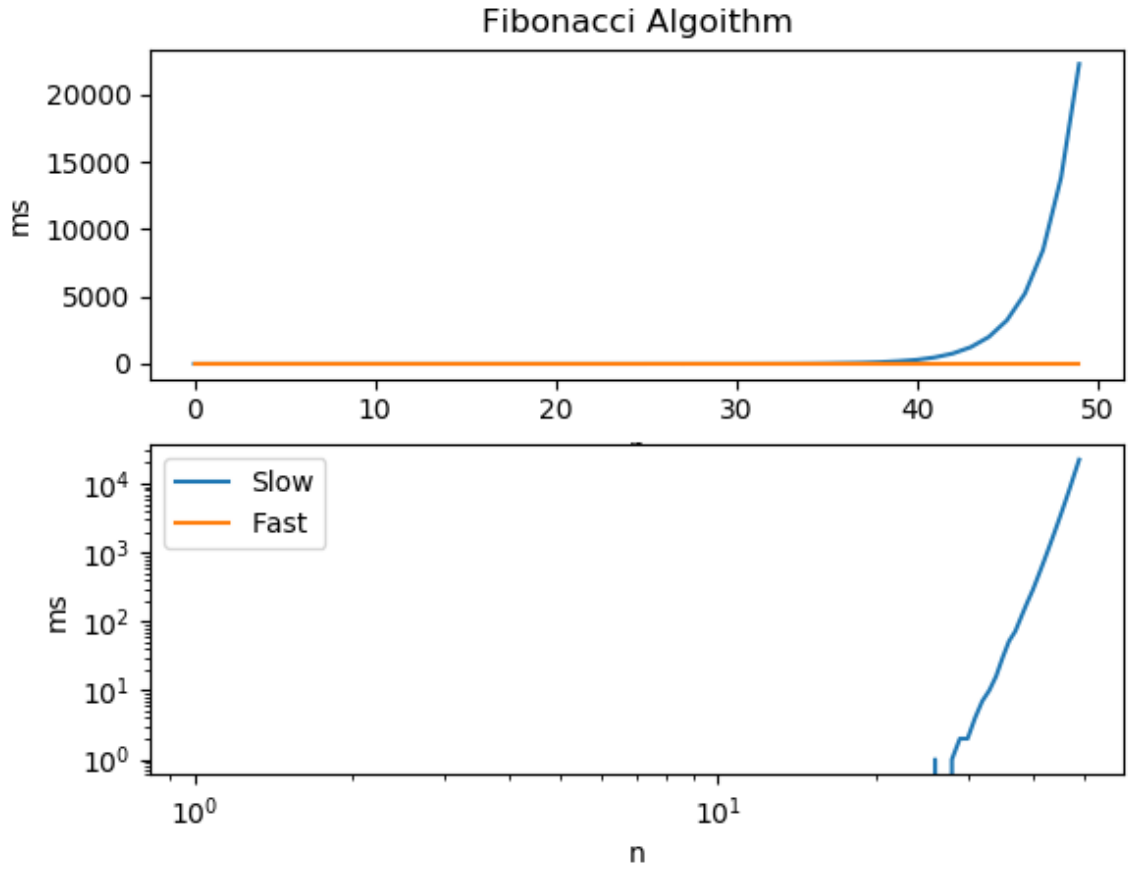
b) $\sim N$

c) $\sim N * lg(N)$

Ex.3

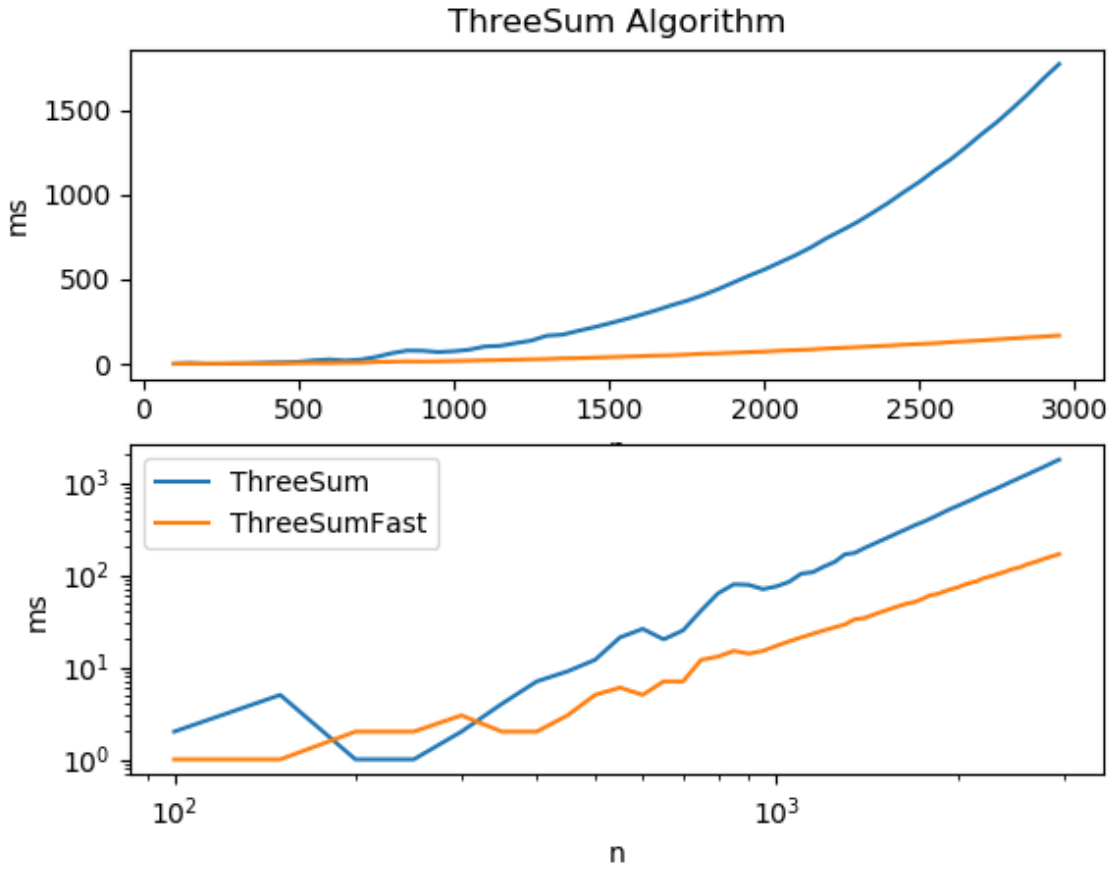
In order to achieve a lg(N), we can throw an egg from the middle floor, then try the middle of the upper floors if the egg doesn't break, or the middle of the lower floors if the egg does break. Then we continue doing the same until we find the floor F.

Ex.4



We can see that the slow algorithm can be as fast as the fast algorithm up to 30 numbers, meaning its almost instantaneous. From there it starts to grow more than exponentially in terms of time consumption. As far as the fast algorithm go, the process is instantaneous up to 50 numbers.

5



The slope of the ThreeSum curve seem to be around 0.5 and the ThreeSumFast one around 0.3 .
Even though the binary search is clearly faster on large number of values, the linear search can be faster in a lower number of value.