

Laboratory practice No. 1: Recursion

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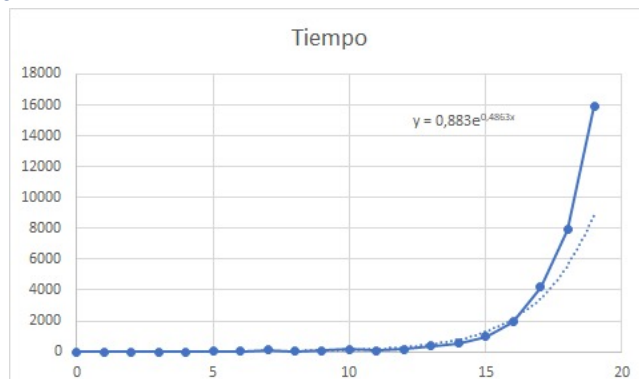
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3) Practice for final project defense presentation

3.1

$T(n, m) = C_3 + T(n-1, m) + T(n, m-1)$, with this equation it is impossible to solve this recurrence equation, what is done is just clear the C_3 and that's it and that's not what we need. So what we do was made this formula: $f = n + m$, then the formula would be so: $T(f) = C_3 + T(f-1) + T(f-1)$ and this is equal to $T(f) = c_3(2^{f-1}) + c_1 2^{f-1}$

3.2



Thanks to the graph you can see that this algorithm has an exponential growth with respect to the time at the time of being executed. Estimating time is incalculable, because if you put this problem in the calculator you'll get an error because it is such an inefficient complexity, it is almost impossible to calculate that time.

3.3

The complexity that we have in this exercise 1.1 because it has a huge time consumption and for this specific case that they tell us that each string has 300.000 characters, calculating the time would be practically indeterminable, the complexity that we found for this algorithm is the most inappropriate for this case.

3.4 [Optional]

3.5

Recursion 1:

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ESTRUCTURA DE DATOS 1

Código ST0245

°**fibonacci**: $T(n) = T(n-1) + T(n-2) + c, O(2^n)$

°**factorial**: $T(n) = T(n-1) + c, O(n+1)$

°**bunnyEars**: $T(n) = T(n-1) + c, O(n+1)$

°**triangle**: $T(n) = T(n-1) + c, O(n+1)$

°**bunnyEars2**: $T(n) = T(n-1) + c, O(n+1)$

Recursion 2:

°**groupsum5**: $T(n) = T(n+1) + T(n+1) + c, O(2^n)$

°**groupsum6**: $T(n) = T(n+1) + T(n+1) + c, O(2^n)$

°**groupNoAdj**: $T(n) = T(n+1) + T(n+1) + c, O(2^n)$

°**splitArray2**: $T(n) = T(n+1) + T(n+1) + c, O(2^n)$

°**splitOdd10**: $T(n) = T(n+1) + T(n+1) + c, O(2^n)$

3.6

°**fibonacci**: n is the Fibonacci number that we want to find. C is a number that is added to the complexity, and is generated by if and math equations

°**factorial**: we want to find the factorial number that is n . C is a number that is added to the complexity, and is generated by if and math equations.

°**bunnyEars**: n is the number of bunnies. C is a number that is added to the complexity, and is generated by if and math equations.

°**triangle**: n is the number of rows of the triangle. C is a number that is added to the complexity, and is generated by if and math equations.

°**bunnyEars2**: n is the number of bunnies. C is a number that is added to the complexity, and is generated by if and math equations.

°**groupsum5**: n is the number of elements in the array, C is a number that is added to the complexity, and is generated by if and math equations.

°**groupsum6**: n is the number of elements in the array, C is a number that is added to the complexity, and is generated by if and math equations.

°**groupNoAdj**: n is the number of elements in the array, C is a number that is added to the complexity, and is generated by if and math equations.

°**splitArray2**: n is the number of elements in the array, C is a number that is added to the complexity, and is generated by if and math equations.

°**splitOdd10**: n is the number of elements in the array, C is a number that is added to the complexity, and is generated by if and math equations.

4) Practice for midterms

4.1 1.A / 2.C / 3.A

4.2 1.A / 2.A & C

4.3 B

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4.4 C

4.5 1.A / 2.B

5) Recommended reading (optional)

6) Team work and gradual progress (optional)

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