Laboratory practice No. 1: Recursion

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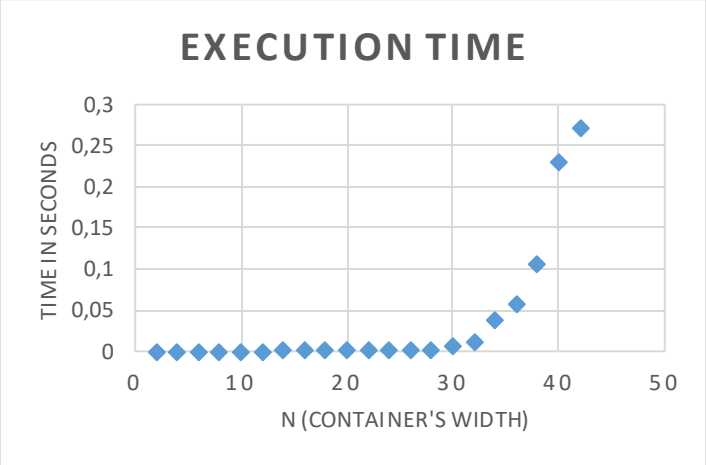
3) Practice for final project defense presentation

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

3.2

n	Milliseconds	Seconds
2	0	0
4	0	0
6	0	0
8	0	0
10	0	0
12	0	0
14	1	0,001
16	1	0,001
18	1	0,001
20	1	0,001
22	2	0,002
24	2	0,002
26	2	0,002
28	2	0,002
30	6	0,006
32	12	0,012
34	38	0,038
36	57	0,057
38	106	0,106
40	230	0,23
42	271	0,271



The graph shows an exponential tendency, it is evident that although the increment is imperceptible when the value of n is considerably small, the execution time grows rapidly as n starts to increase its value.

3.3 We consider this algorithm is not efficient enough for the Puerto de Urabá Proyect since it took about 33 seconds to calculate the answer for n=50cm, and the real containers used in the ports measure thousands of centimeters.

3.4 -

3.5 & 3.6

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C as the constant factor of time that it takes the algorithm to develop elementary operations, T(n) as the total time, T as the time required to do the instruction:

a) bunnyEars: T(n) = T(n-1) + c (n is the number of bunnies)
b) change XY: T(n) = T(n-1) + c (n is the String's length)
c) array11: T(n) = T(n-1) + c (n is the array's length minus the index)
d) countHi: T(n) = T(n-1) + c (n is the String's length)
e) endX: T(n) = T(n-1) + c (n is the String's length)
f) groupSum6: T(n) = 2 * T(n-1) + c (n is the array's length minus start)
g) groupSum5: T(n) = 2 * T(n-1) + c (n is the array's length minus start)
h) groupNoAdj: T(n) = T(n-1) + c (n is the array's length minus start)
i) splitArray: T(n) = T(n-1) + c (n is the array's length minus start)
j) splitOdd10: T(n) = T(n-1) + c (n is the array's length minus start)

4) Practice for midterms

4.1 *Line 3: True;*
Line 4: str.charAt(0)==str.charAt(str.length()-1)
4.2 *d*
4.3 *Line 4: (n-a, a, b, c) + 1;*
Line 5: (res, solucionar(n-b, a, b, c) +1)
Line 6: (res, solucionar(n-c, a, b, c)+1)
4.4 *e*
4.5 a) *Line 3: if(T==0) return 1;*
Line 4: if(T<3 && T!=0) return 0;
Line 8: f1+f2+f3
b) *b*
4.6 *Line 10: sumaAux(n.substring(i),i+2)*
Line 11: sumaAux(n.substring(1),i)
4.7 *-*
4.8 *Line 9: return 0;*
Line 13: ni+nj;
4.9 *-*
4.10 *b*
4.11 ***a)*** *Line 4: lucas(n-1) + lucas(n-2);*
b) *c*
4.12 *Line 7: sat*
Line 17: fi+fj
Line 18: sat

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