Laboratory practice No. X: Big O notation

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3) Practice for final project defense presentation

3.1

Insertion Sort	
items	time(ms)
100	0
1000	1
2000	4
4000	6
8000	29
16000	58
32000	182
64000	710
128000	2451
256000	10749
356000	20548
456000	36533
512000	45226
666666	85290
720000	99637
800000	121944
810000	128459
900000	153460
2000000	871854

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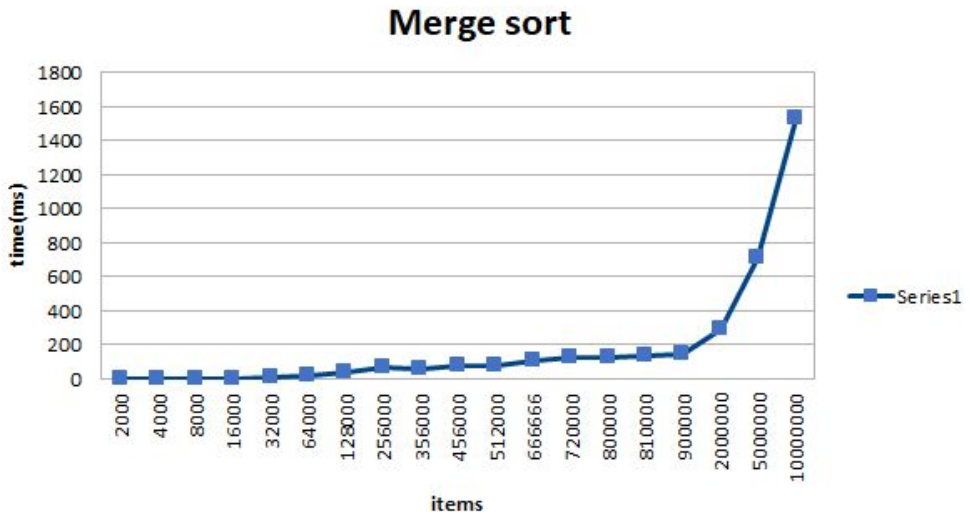
Merge Sort	
items	time(ms)
2000	1
4000	1
8000	3
16000	4
32000	9
64000	24
128000	39
256000	66
356000	62
456000	73
512000	79
666666	108
720000	130
800000	125
810000	135
900000	143
2000000	292
5000000	711
10000000	1530

3.2



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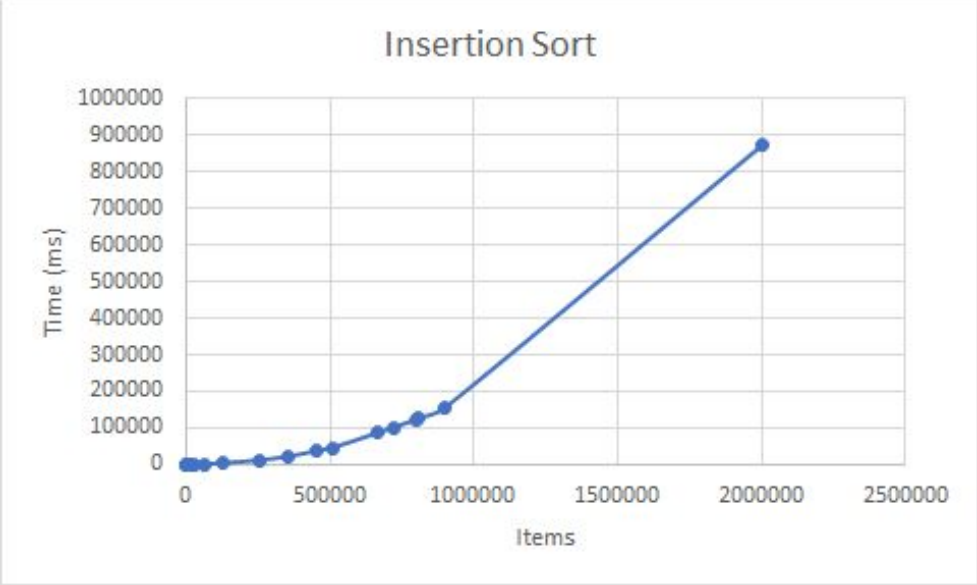

3.3 Merge sort is much quicker than Insertion sort, making it more effective sorting huge arrays because its complexity is less, so it takes less time arranging them.

3.4 It is not accurate to use insertion sort to arrange huge quantities of elements. In a video game it will take a considerably amount of time, so it can make the game extremely slow.

3.5 In the of huge arrays, the method insertion sort is faster when the majority of the elements are in order, the reason of these is because the method uses just one space in the memory instead of two like merge sort, which makes easier and faster to go over the array, while is trying to organize it.

3.6 Array 2:

- only14: T(n)= n + k
- countEvens: T(n)= n + k
- sum13: T(n)= n + k
- lucky13: T(n)= n + k
- fizzArray: T(n)= n

Array 3:

- canBalance: T(n)= n(m+n)
- linearIn: T(n)= n + k
- seriesUp: T(n)= n^2
- fix34: T(n)= 2n^2 + 2nk
- maxSpan: T(n)= n^2 + nk

3.7 Basically there are two loops, one that goes from the beginning to the end and the other that does the opposite and every time he founds a position that contains the same as the first position, takes the length and compares, using a java method call Math.max, the maxSpam he had already save with the new one and saves the largest one. At the end the method returns the biggest span.

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3.8 k= constant
n= condition that change every time that a recursive call is made
m= condition that change every time that a recursive call is made

4) Practice for midterms

4.1 *c) O(n+m)*
4.2 *b) O(mxnx $\sqrt{n}$)*
4.3 *b)O(ancho)*
4.4 *a) O(n^4)*
4.5 *d) O(n^2)*
4.6 *d) T(n)=T(n+1)+C*
4.9 *d) execute more than nxm steps*

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