Algorithmics	Student information	Date	Number of session
	UO: 257850	02/03/2021	2
	Surname: Campa Martínez		
	Name: Armando		

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Measurements

i	BubbleDirect	BubbleInverse	BubbleRandom
20000	368	455	552
40000	1566	1881	2598
80000	1448	6638	10713
160000	5462	26465	54307
320000	16303	134563	199739
640000	55962	409676	803941
1280000	316522	33241833	
2560000	1164327		

Given that BubbleSort always has a O(n^2) complexity, it makes sense that the measurements are similar. They sometimes change because unfortunately I had to run them while on class.

i	InsertionDirect	InsertionInverse	InsertionRandom
20000	1	548	41
40000	2	265	152
80000	1	1020	631
160000	2	3942	2479
320000	1	15663	9350
640000	1	61873	36874
1280000	1	278485	162428
2560000			

As the Insertion algorithm complexity is usually O(n^2) but O(n) in the best case scenario, it is very clear why the first column times are so small while the others are higher, and random is smaller because the best o better case scenario appears more times than with inverse vector.

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i	QuicksortDirect	QuicksortInverse	QuicksortRandom
20000	3	3	5
40000	4	4	8
80000	6	8	10
160000	6	4	16
320000	8	8	34
640000	11	17	67
1280000	24	36	150
2560000			

Quicksort is a very fast algorithm, having a complexity of O(nlogn) in most cases. As such, recorded times are very low, although higher in random as it is more probable that a bad case scenario happens.

i	SelectionDirect	SelectionInverse	SelectionRandom
20000	62	108	88
40000	151	363	426
80000	736	2041	2262
160000	2633	7968	13909
320000	11507	31420	98724
640000	55025	120717	689899
1280000	236164	534135	1594623
2560000			

This is a similar case to Bubble sorting, times are consistent due to always having the same complexity at all times.

Quicksort Fateful

In this case the pivot is chosen by taking the first element. It is highly probable that this is not a good value, to use as pivot. In fac, it is possible that this is the worst possible pivot, once we approach the end of the execution.

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Ultimately this means that we are using the worst complexity most of the time, making the measured times resemble more that characteristic of O(n^2) rather than that of O(nlogn), which is quite worse.