eda121311903119O6

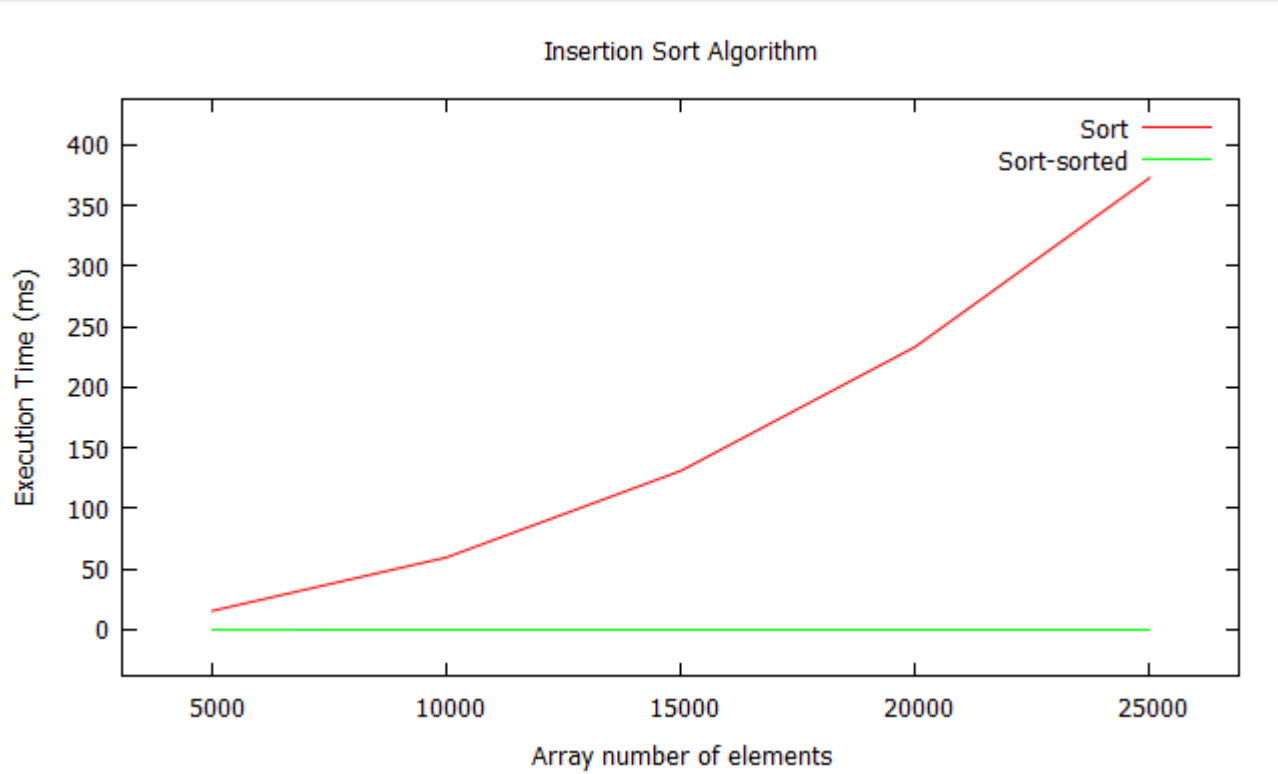
Estudo da complexidade de algoritmos

Algoritmos em estudo

- Insertion
- Bubble
- Heap
- Merge
- Quicksort
- Radix
- Bucket
- Counting
- Comb
- Shell
- Selection

Insertion

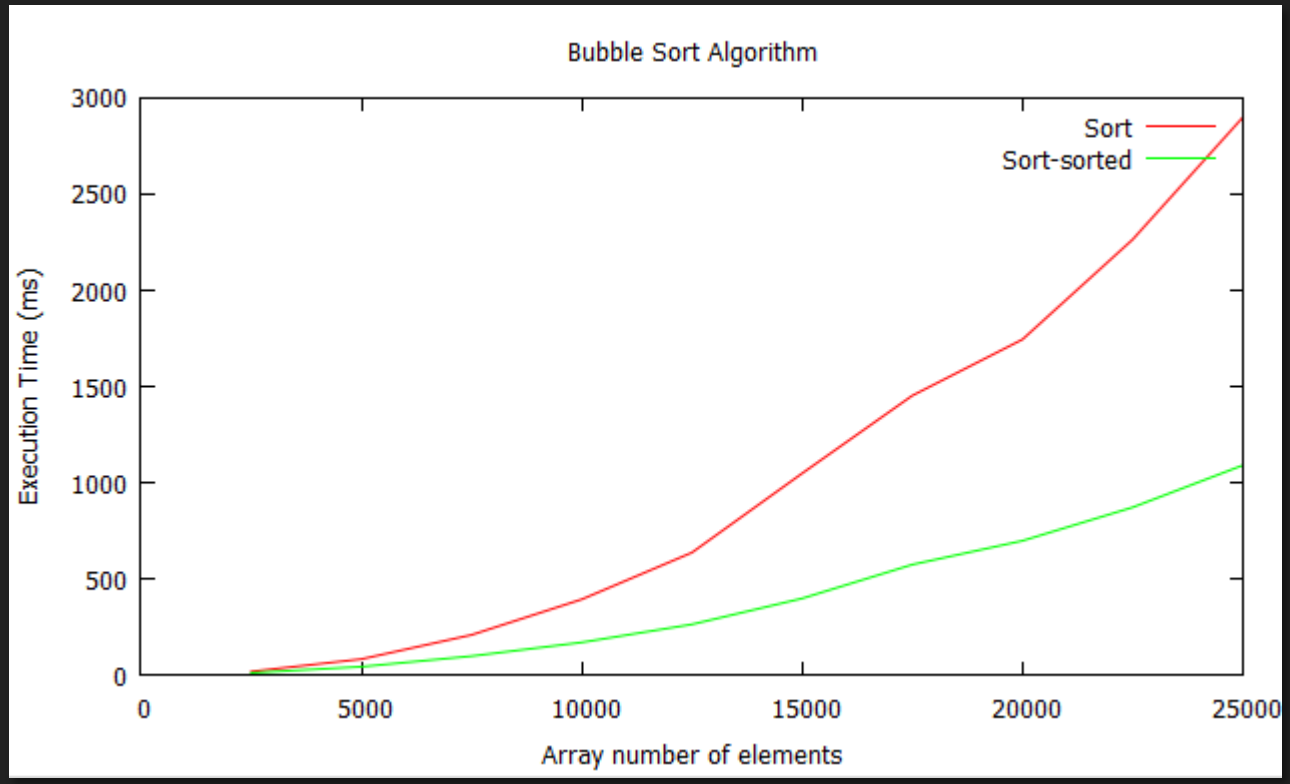
Pior caso: O (n^2)
Caso médio: O (n^2)
Melhor caso: O (n)



# Nº	Sort	Sort-sorted
5000	15.557	0.0322
10000	59.6854	0.0489
15000	131.1569	0.0651
20000	233.452	0.0833
25000	372.877	0.1003

Bubble

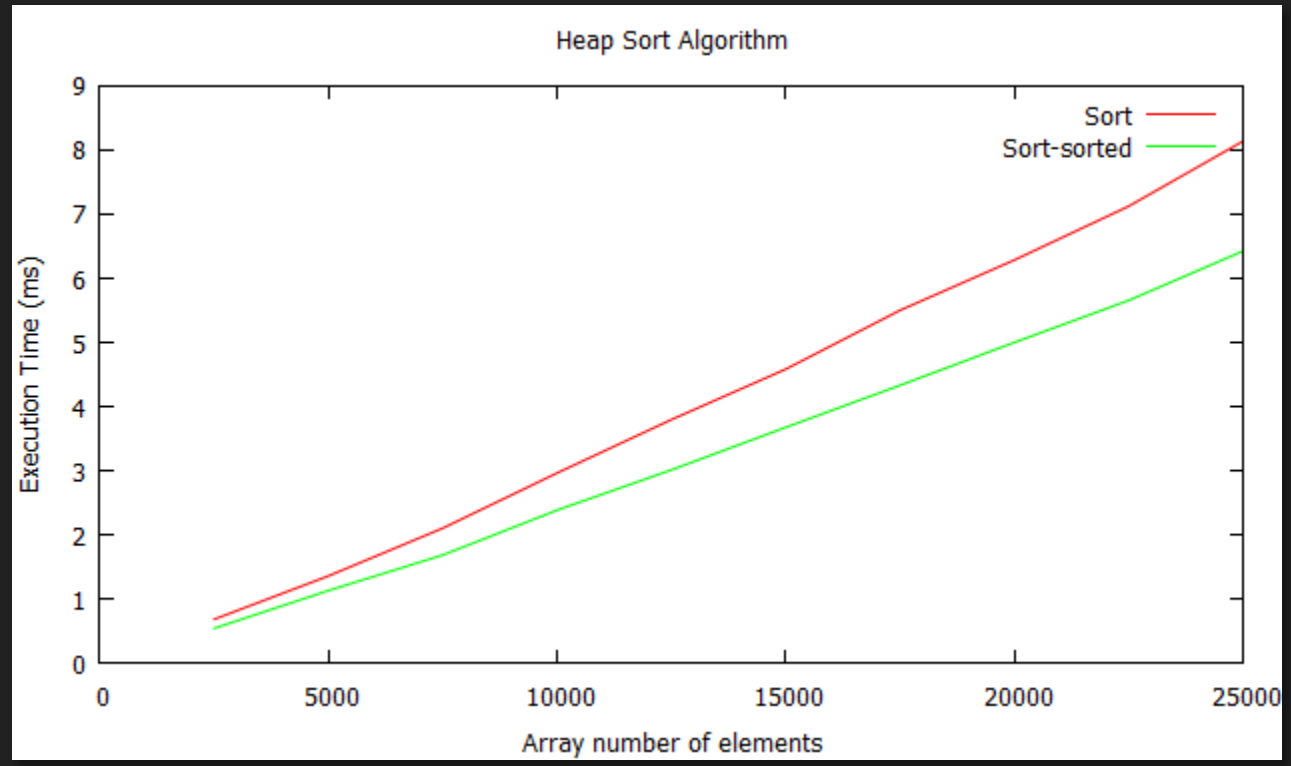
Pior caso: O (n^2)
Caso médio: O (n^2)
Melhor caso: O (n)



# Nº	Sort	Sort-sorted
2500	17.035	10.5695
5000	81.6614	42.1405
7500	207.6276	97.2523
10000	392.3867	168.5123
12500	635.8622	262.2661
15000	1047.5458	397.3973
17500	1452.1726	573.0037
20000	1744.1806	697.3344
22500	2263.7188	871.1923
25000	2899.2318	1089.7475

Heap

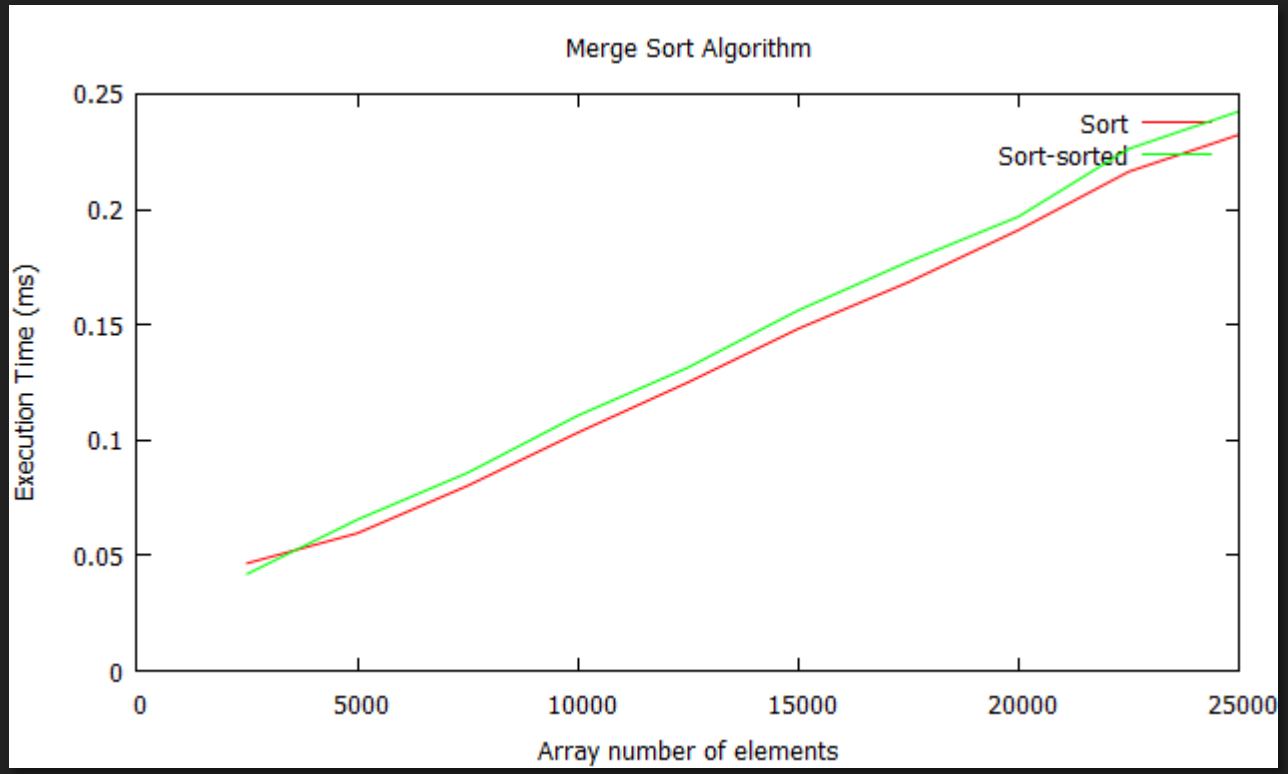
Pior cenário: O (n log (n))
Caso médio: O (n log (n))
Melhor caso: O (n log (n))



# Nº	Sort	Sort-sorted
2500	0.679	0.5389
5000	1.3563	1.1278
7500	2.1009	1.6816
10000	2.9615	2.3824
12500	3.7942	3.0094
15000	4.5816	3.6742
17500	5.4989	4.3292
20000	6.2845	4.9983
22500	7.1219	5.6547
25000	8.1364	6.4229

Merge

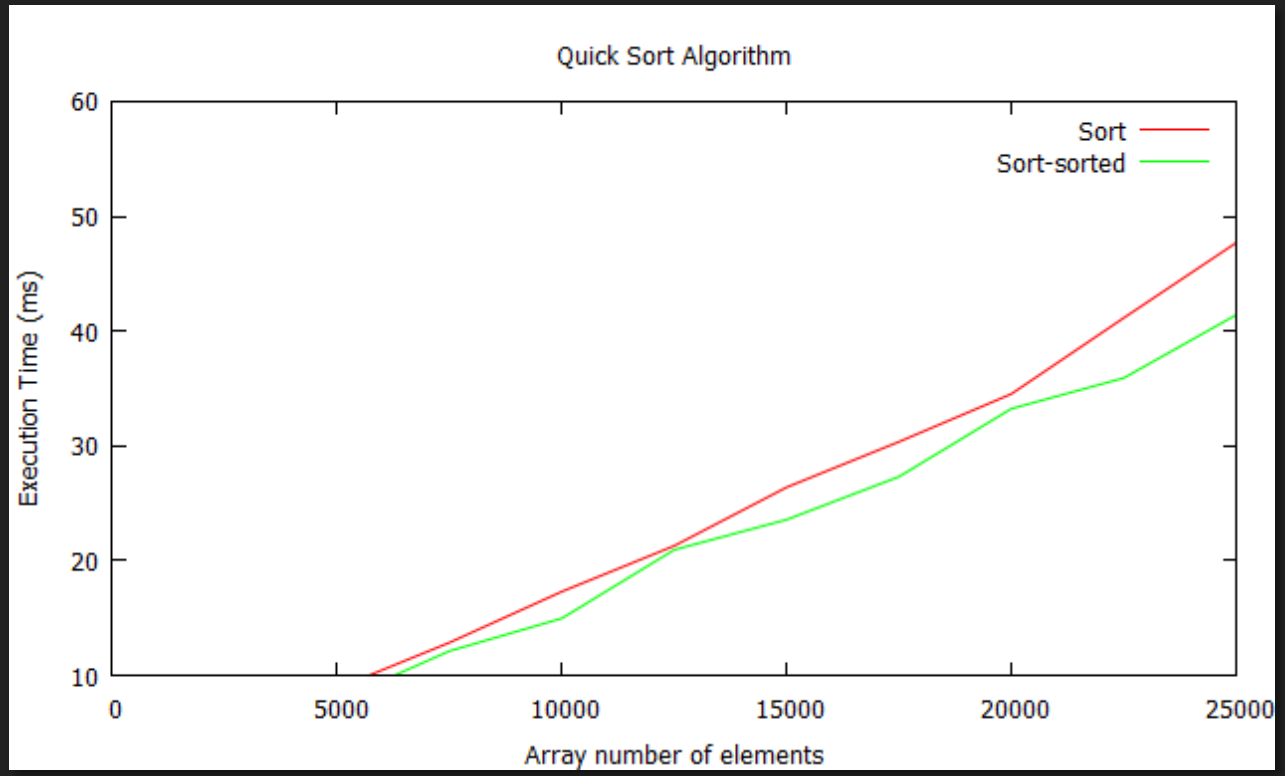
Pior cenário: $O(n^{\log_b a} \log(n))$
Caso médio: O (n log (n))
Melhor caso: O (n log (n))



# Nº	Sort	Sort-sorted
2500	0.0466	0.042
5000	0.0596	0.0655
7500	0.0802	0.0858
10000	0.1032	0.1106
12500	0.125	0.1314
15000	0.1482	0.1562
17500	0.1684	0.1773
20000	0.191	0.1968
22500	0.2163	0.2262
25000	0.2323	0.2424

Quicksort

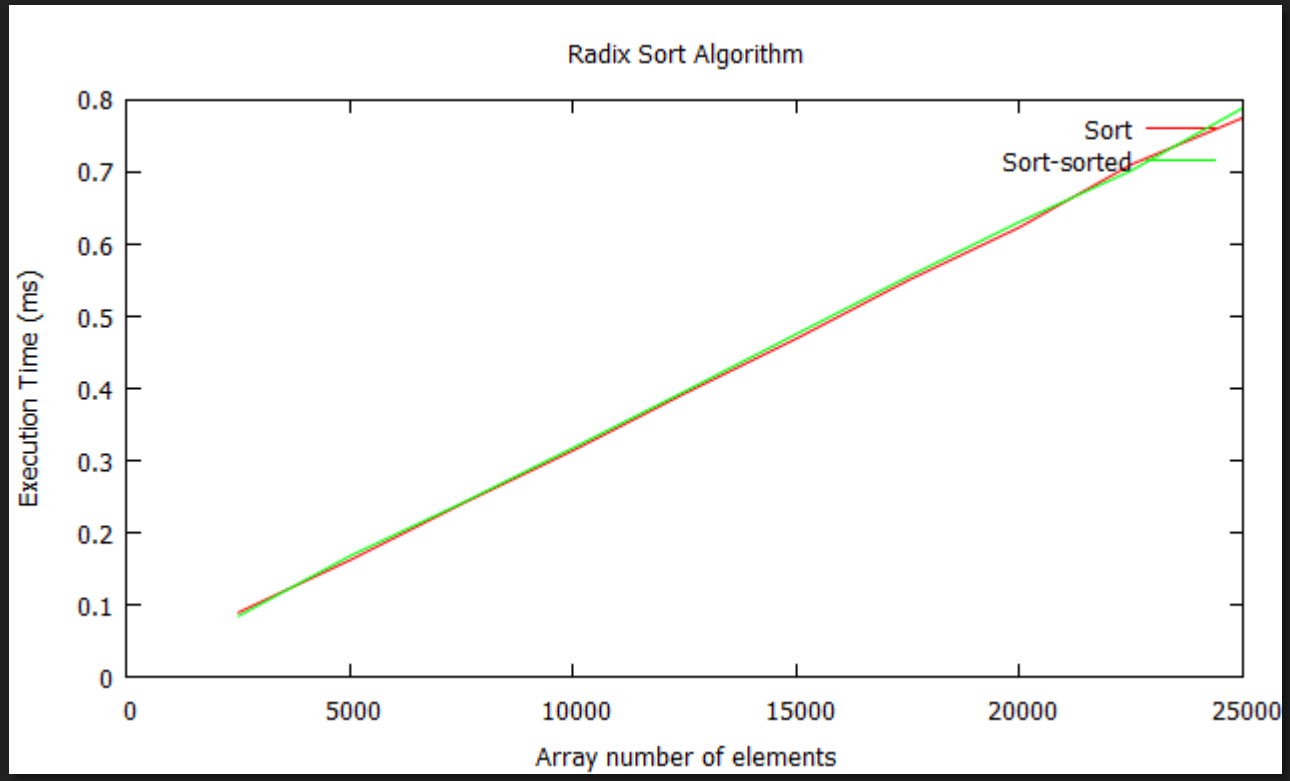
Pior cenário: O (n^2).
Caso médio: O (n log (n))
Melhor Caso: O (n log (n))



# Nº	Sort	Sort-sorted
2500	4.4372	3.7681
5000	8.8683	7.7838
7500	12.8538	12.12
10000	17.298	14.9595
12500	21.2783	20.9301
15000	26.3824	23.5627
17500	30.3453	27.3019
20000	34.5133	33.2304
22500	41.1341	35.9031
25000	47.6799	41.3942

Radix

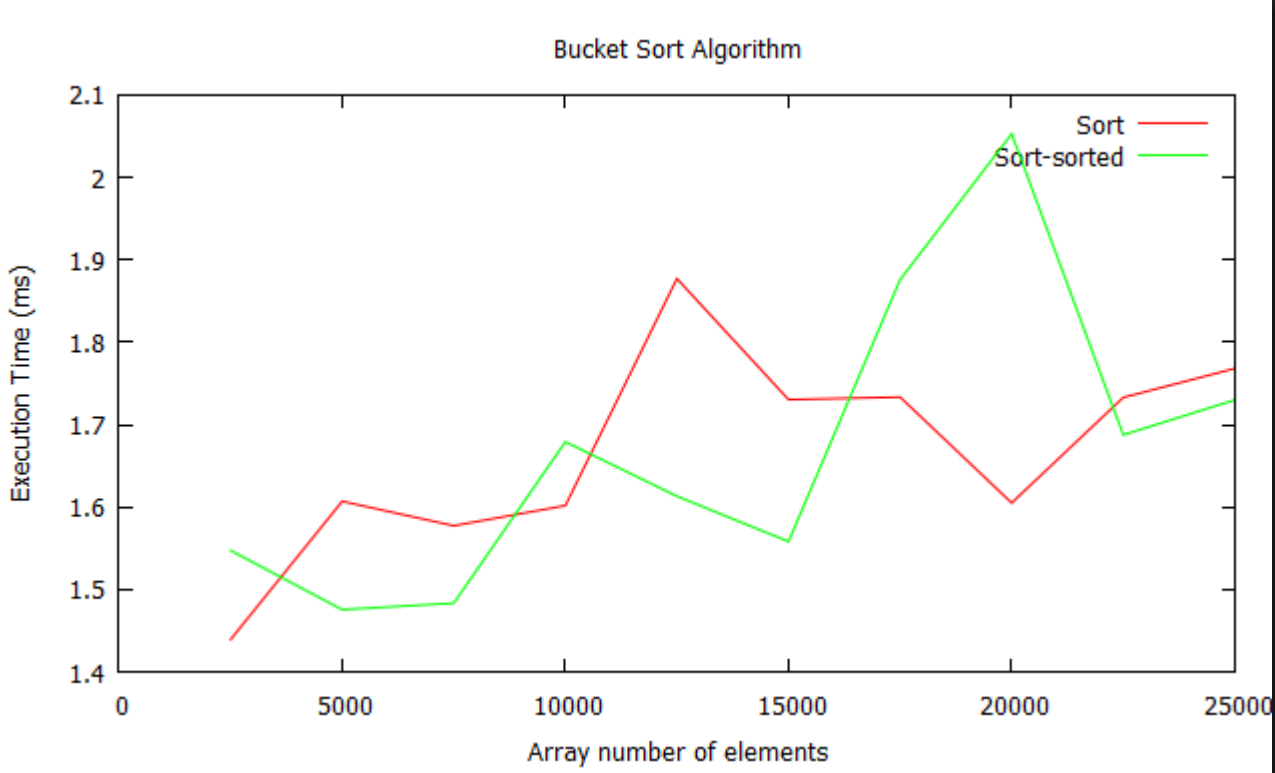
Pior caso: O (n + s)
Melhor caso: O (Kn)



# Nº	Sort	Sort-sorted
2500	0.0894	0.0843
5000	0.1619	0.1679
7500	0.2396	0.2409
10000	0.314	0.3178
12500	0.393	0.3961
15000	0.4691	0.4755
17500	0.5498	0.5549
20000	0.6235	0.631
22500	0.7104	0.702
25000	0.7751	0.7889

Bucket

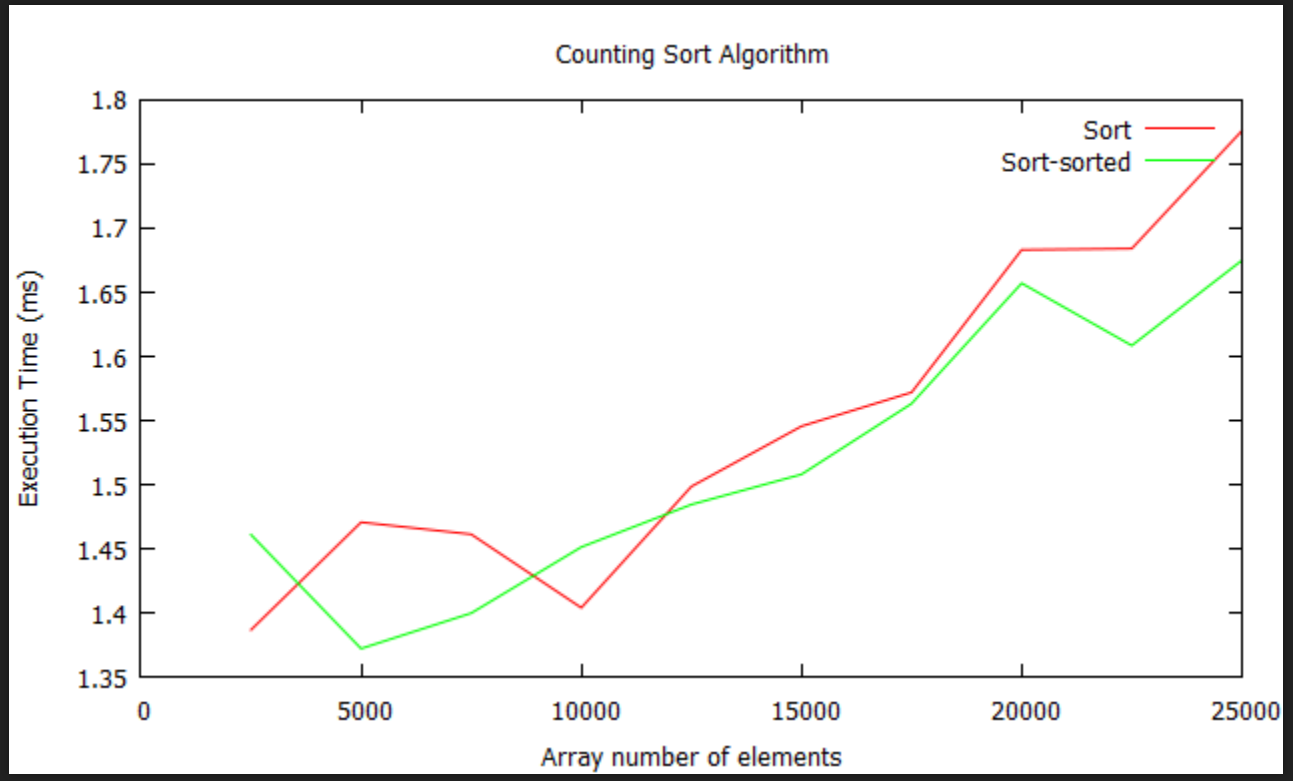
Pior caso: O (n * k)
Caso médio: O (n + k)
Melhor caso: O (n^2)



# Nº	Sort	Sort-sorted
2500	1.4392	1.5473
5000	1.6069	1.4755
7500	1.5772	1.4833
10000	1.6017	1.6791
12500	1.8771	1.6131
15000	1.7303	1.558
17500	1.7333	1.8758
20000	1.6049	2.0528
22500	1.7329	1.6874
25000	1.7681	1.73

Counting

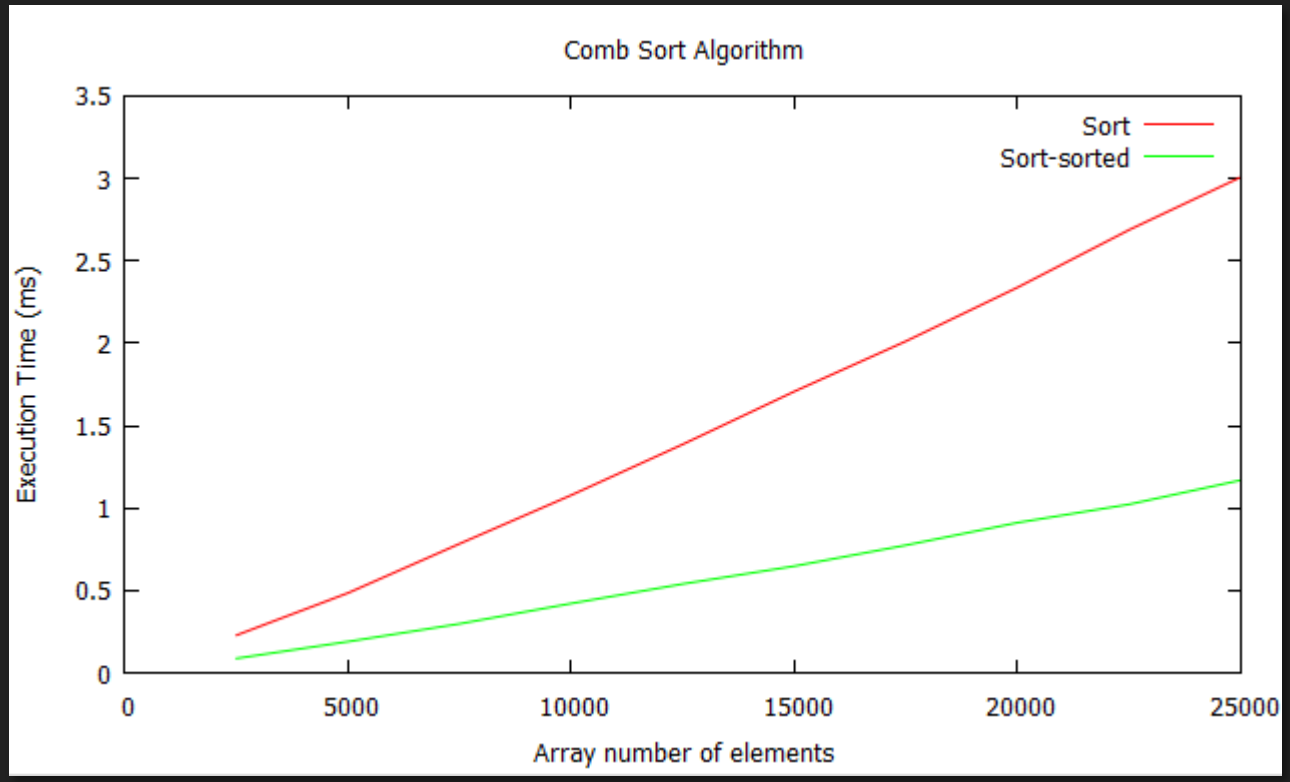
Pior caso: O (n + k)
Caso médio: O (n + k)
Melhor caso: O (n + k)



# Nº	Sort	Sort-sorted
2500	1.3866	1.4609
5000	1.4706	1.372
7500	1.4612	1.3997
10000	1.4039	1.4512
12500	1.4985	1.4844
15000	1.5455	1.5079
17500	1.5719	1.5631
20000	1.6831	1.657
22500	1.684	1.6084
25000	1.7759	1.6748

Comb

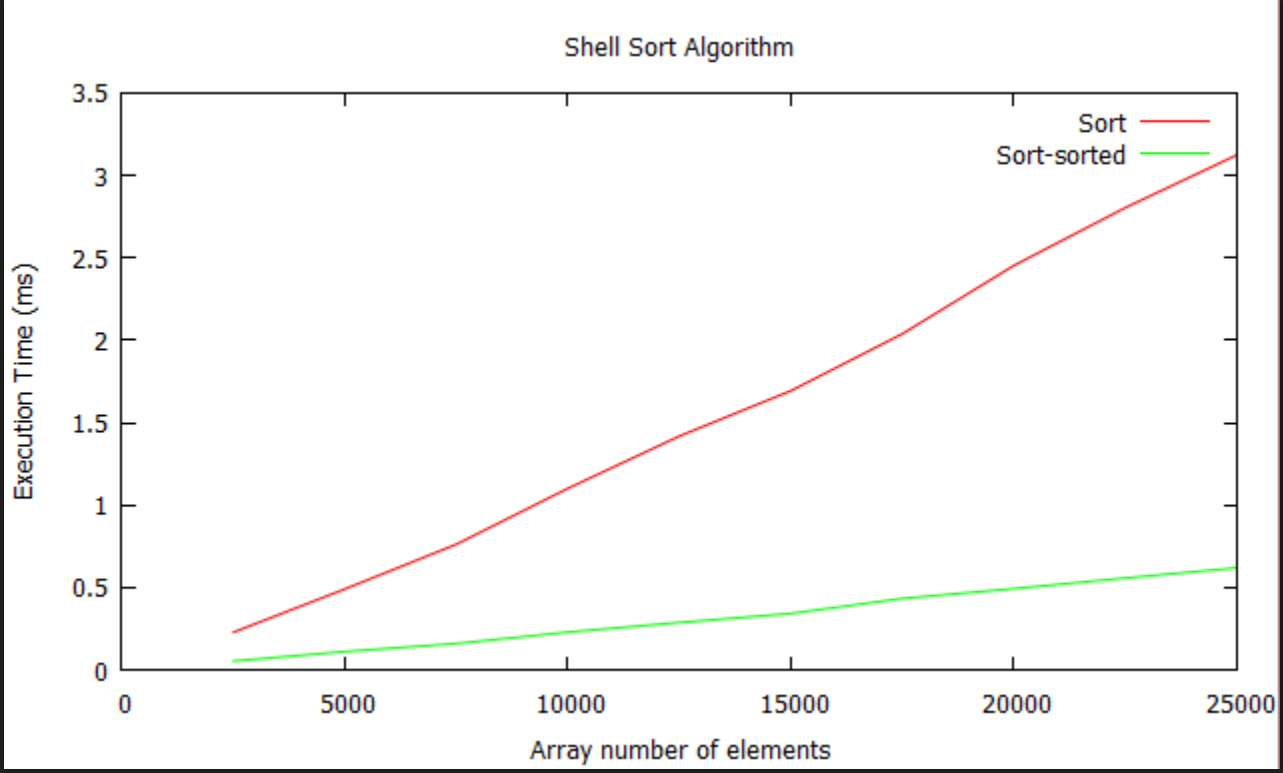
Pior caso: $\Omega(n^2)$
Caso médio: $\Omega(n^2 / 2^b)$
Melhor caso: $O(n)$



# N°	Sort	Sort-sorted
2500	0.2283	0.0875
5000	0.4849	0.1894
7500	0.7837	0.2979
10000	1.0779	0.4212
12500	1.3869	0.5392
15000	1.7072	0.6475
17500	2.0124	0.7747
20000	2.3388	0.911
22500	2.6876	1.022
25000	3.0071	1.1688

Shell

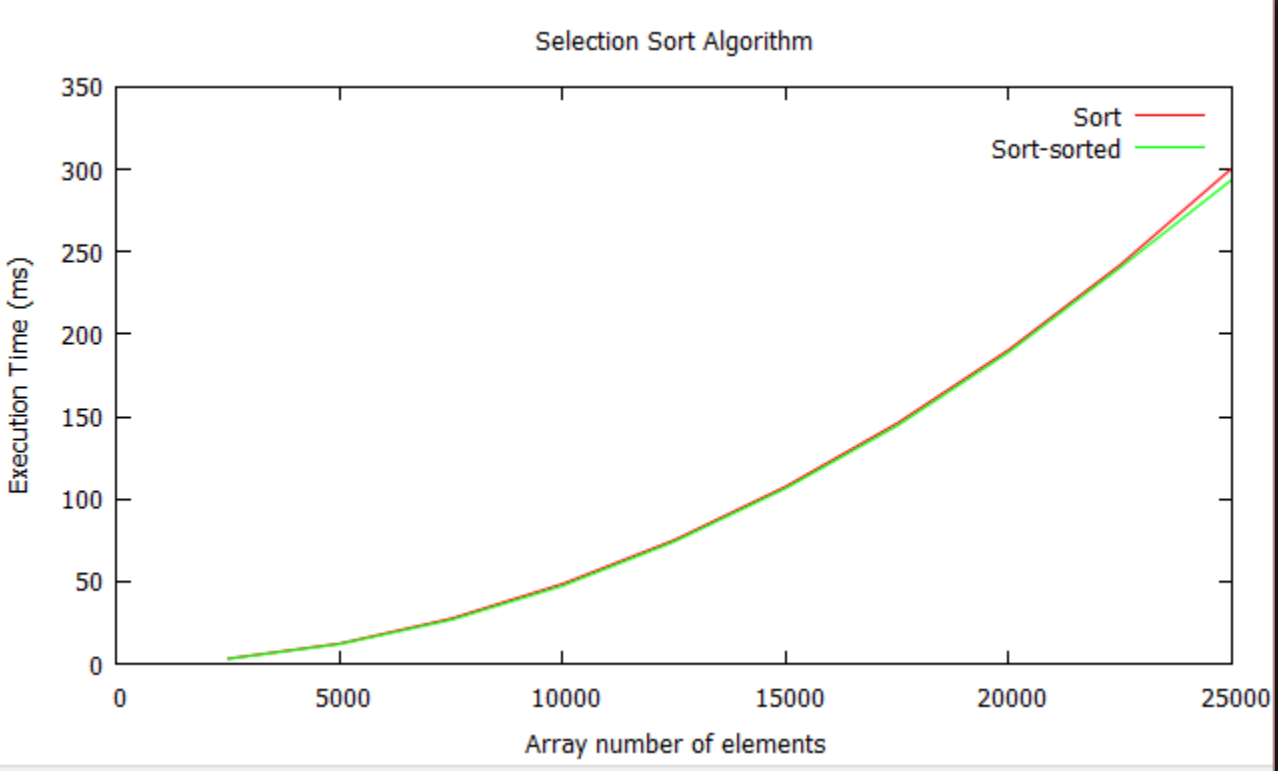
Pior caso: $O(n \log^2 n)$
Caso médio: $O(n)$
Melhor caso: $O(n)$



# Nº	Sort	Sort-sorted
2500	0.2276	0.0536
5000	0.4899	0.1109
7500	0.762	0.1599
10000	1.1008	0.229
12500	1.4178	0.2872
15000	1.6927	0.3422
17500	2.0385	0.4331
20000	2.4526	0.4926
22500	2.8037	0.5573
25000	3.1231	0.6192

Selection

Pior caso: O (n^2)
Caso médio: O (n^2)
Melhor caso: O (n^2)



# Nº	Sort	Sort-sorted
2500	3.232	2.9973
5000	12.3287	11.9807
7500	27.4999	26.6452
10000	48.5909	47.4012
12500	75.1666	74.102
15000	107.6313	106.5069
17500	146.0439	144.426
20000	190.6101	189.1041
22500	242.0928	240.4674
25000	300.6341	293.7253

Comparação entre todos os algoritmos