

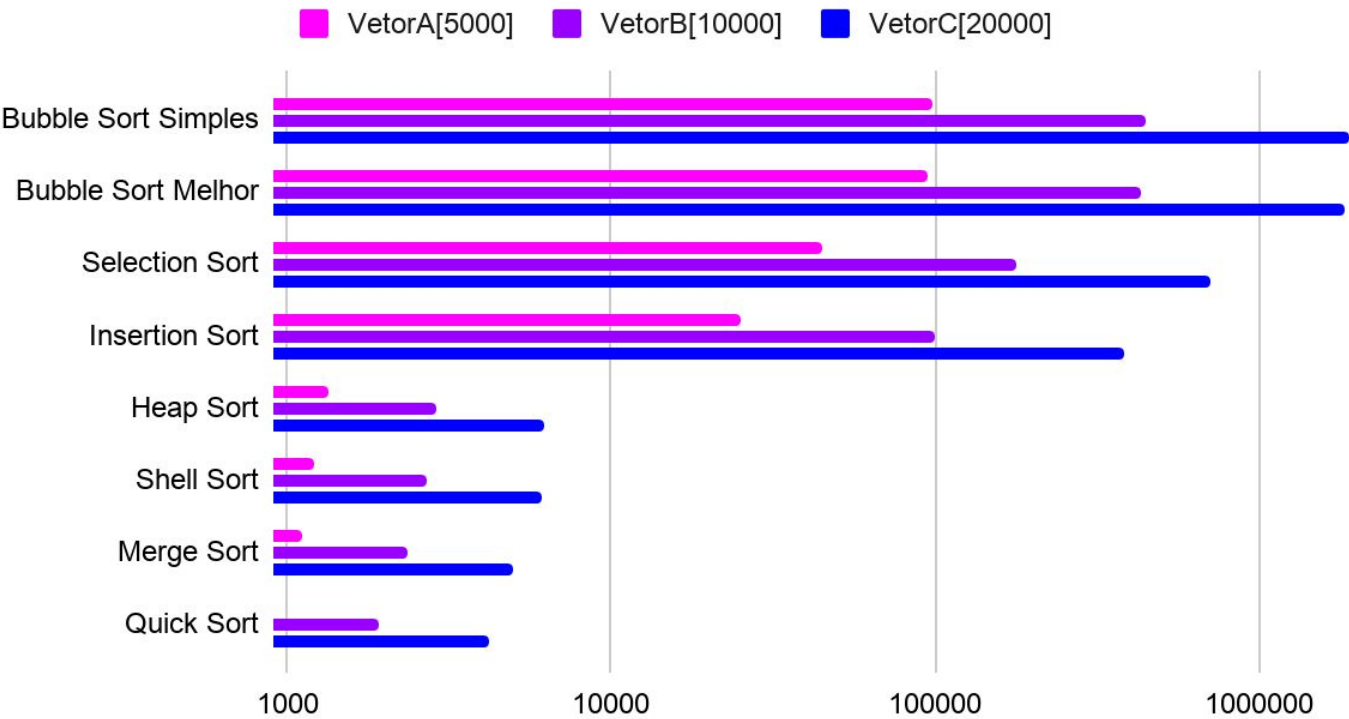
Trabalho PAA

Gustavo Palmeira Zaia	191252158
Rafael Bassi Rosseto	191251968
Vinicius Bolachinha	191251852

Tempo médio de ordenação em microssegundos (usando 10 amostras)

	vetorA[5000]	vetorB[10000]	vetorC[20000]
Bubble Sort Simples	98132	444890	1914100
Bubble Sort Melhor	94507	428624	1833299
Selection Sort	44575	176986	705237
Insertion Sort	24941	99004	384864
Heap Sort	1337	2884	6237
Shell Sort	1220	2711	6057
Merge Sort	1115	2364	5003
Quick Sort	907	1927	4231

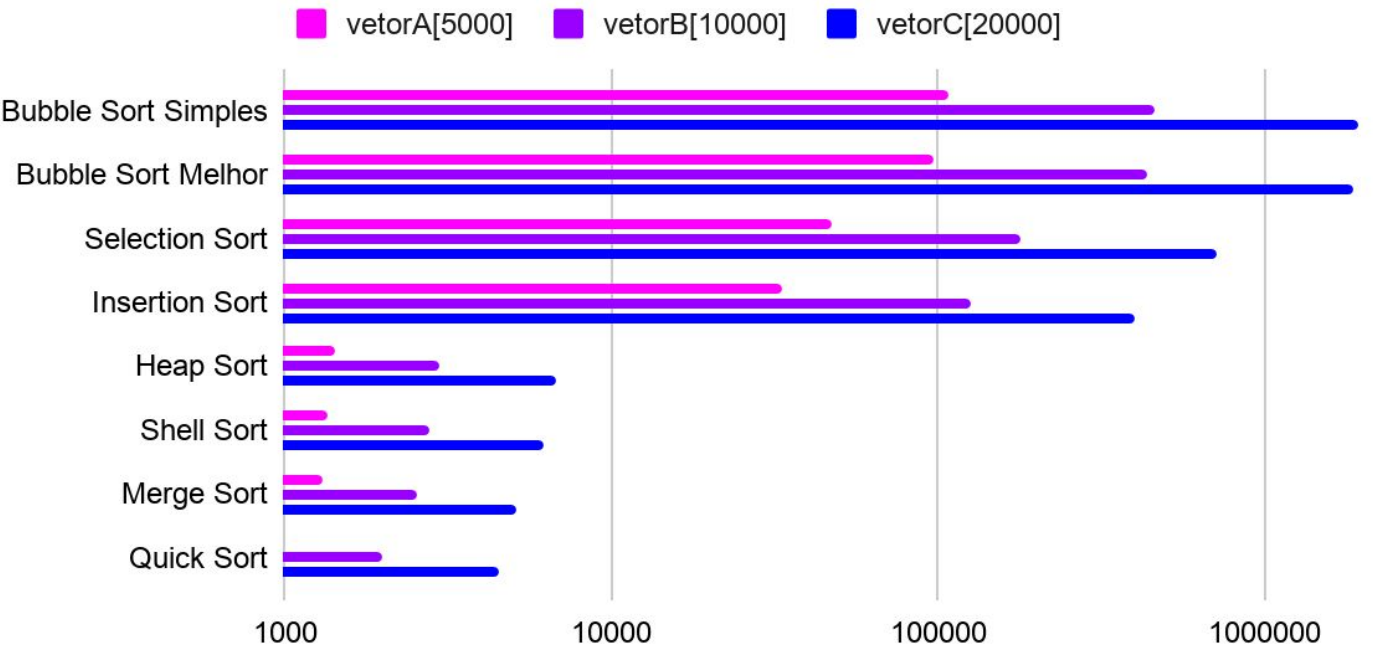
Tempo médio de ordenação em microssegundos



Maior tempo de ordenação em microssegundos (entre 10 amostras)

	vetorA[5000]	vetorB[10000]	vetorC[20000]
Bubble Sort Simples	107960	463289	1922020
Bubble Sort Melhor	97215	437807	1881489
Selection Sort	46875	179304	713396
Insertion Sort	33258	125297	402007
Heap Sort	1434	2952	6707
Shell Sort	1340	2748	6162
Merge Sort	1302	2527	5095
Quick Sort	983	1980	4507

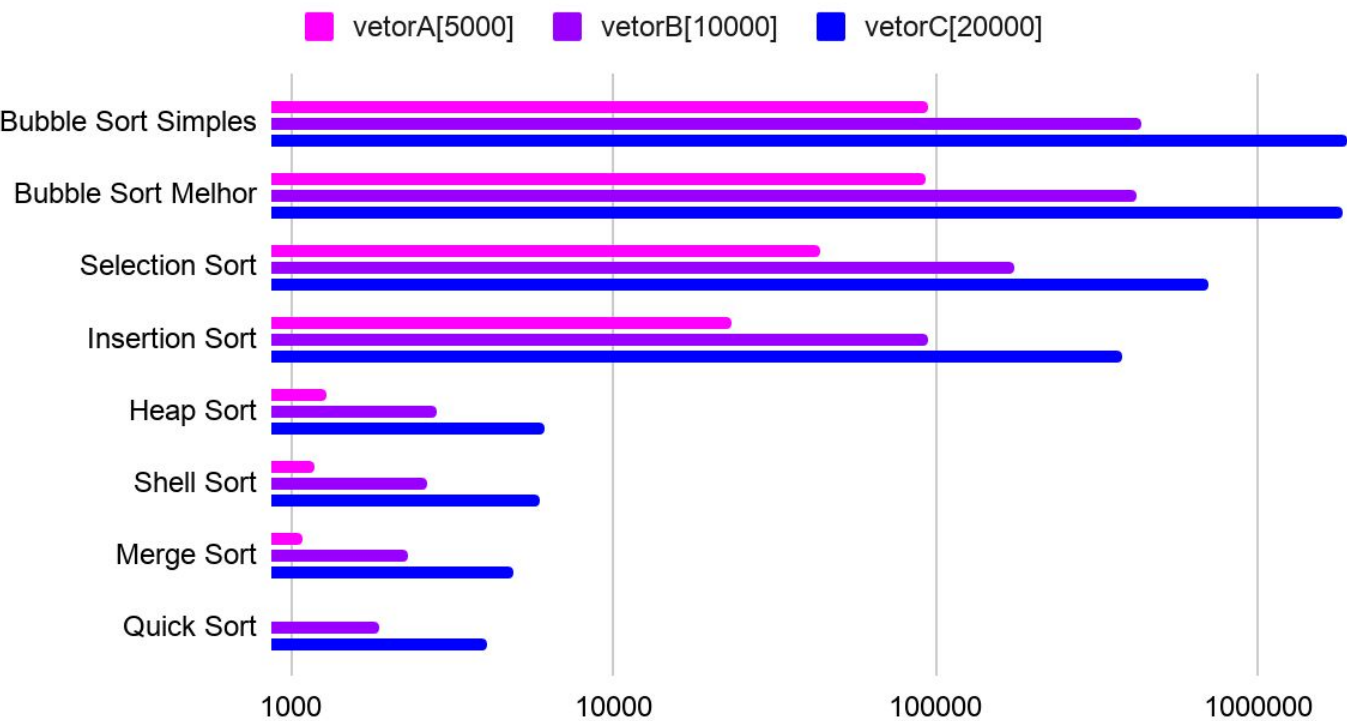
Maior tempo de ordenação em microssegundos



Menor tempo de ordenação em microssegundos (entre 10 amostras)

	vetorA[5000]	vetorB[10000]	vetorC[20000]
Bubble Sort Simples	94727	435398	1906194
Bubble Sort Melhor	92828	420677	1822549
Selection Sort	44036	175193	701687
Insertion Sort	23214	94666	380022
Heap Sort	1295	2850	6091
Shell Sort	1184	2672	5916
Merge Sort	1081	2309	4911
Quick Sort	872	1878	4070

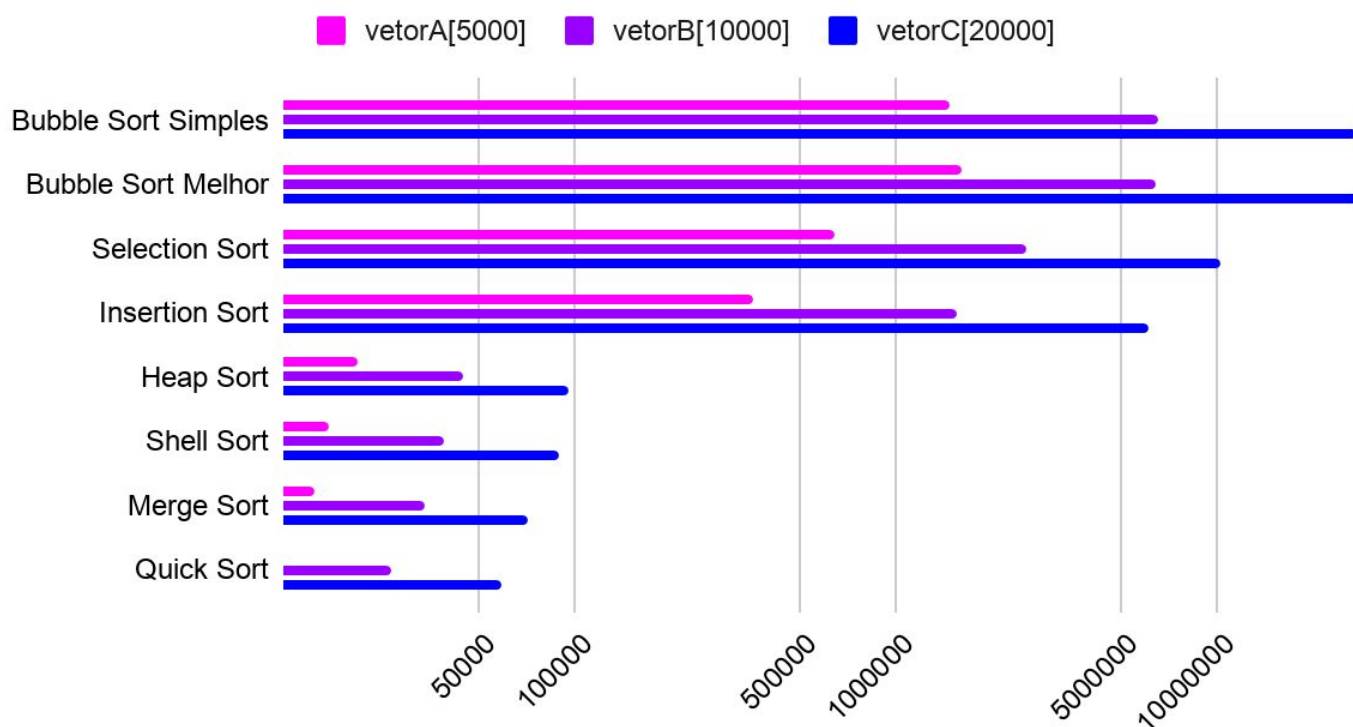
Menor tempo de ordenação em microssegundos



Tempo de execução das 10 amostras em microssegundos

	vetorA[5000]	vetorB[10000]	vetorC[20000]
Bubble Sort Simples	1466135	6542549	27415946
Bubble Sort Melhor	1587332	6491969	28001122
Selection Sort	644855	2562542	10223107
Insertion Sort	359422	1536456	6097645
Heap Sort	20977	44307	94739
Shell Sort	17036	38786	88423
Merge Sort	15326	33963	70970
Quick Sort	12310	26618	58515

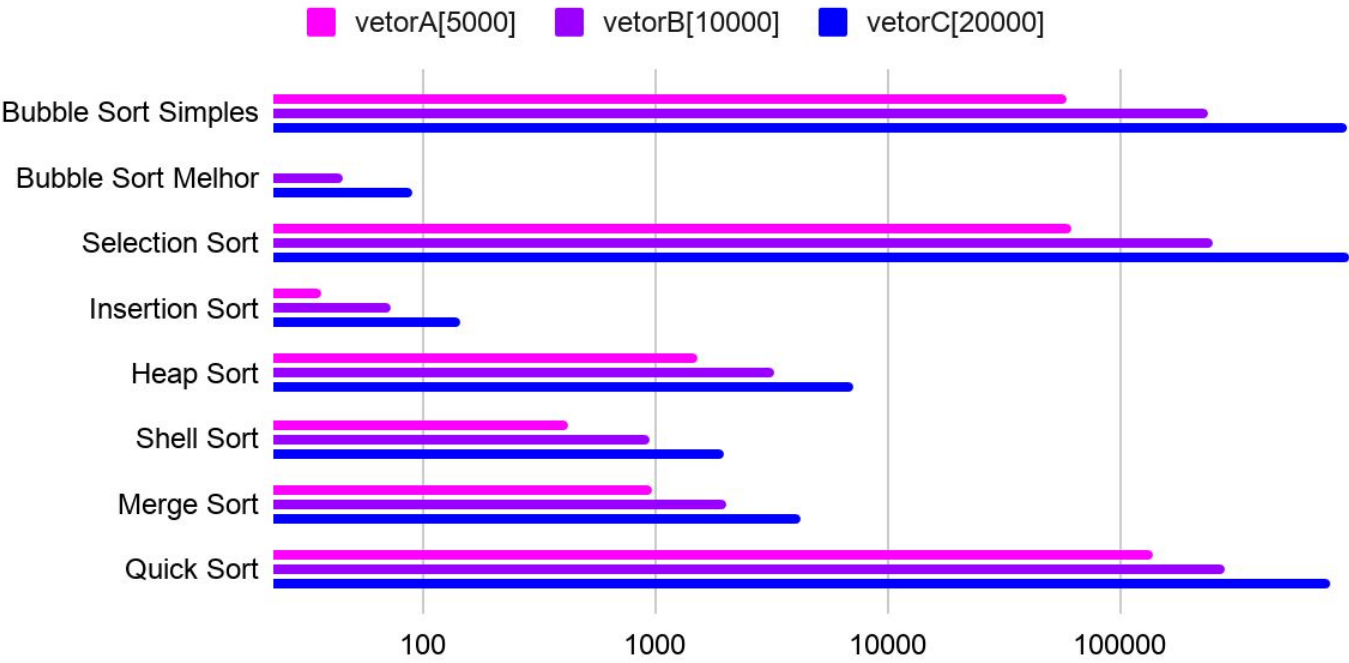
Tempo de ordenação de 10 vetores em microssegundos



**Tempo de ordenação com as amostras em ordem crescente em microssegundos
(usando 10 amostras)**

	vetorA[5000]	vetorB[10000]	vetorC[20000]
Bubble Sort Simples	58704	236709	945521
Bubble Sort Melhor	23	46	92
Selection Sort	61190	250643	980324
Insertion Sort	37	74	147
Heap Sort	1513	3291	7086
Shell Sort	430	956	1981
Merge Sort	966	2027	4290
Quick Sort	138826	281682	799489

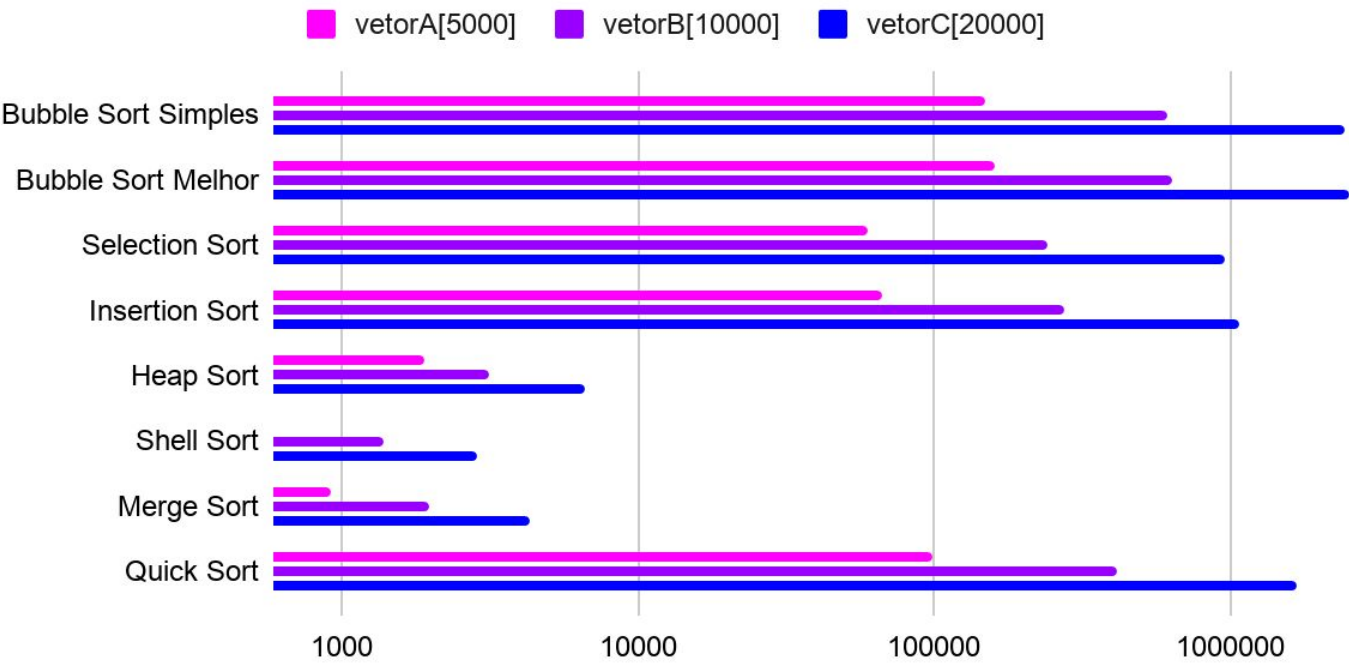
Tempo de ordenação de 10 amostras ordenadas em ordem crescente em microssegundos



Tempo de ordenação com as amostras em ordem decrescente em microssegundos
(usando 10 amostras)

	vetorA[5000]	vetorB[10000]	vetorC[20000]
Bubble Sort Simples	150077	609919	2433754
Bubble Sort Melhor	159470	637376	2547300
Selection Sort	59998	239790	958450
Insertion Sort	67078	275545	1072040
Heap Sort	1887	3165	6586
Shell Sort	588	1397	2875
Merge Sort	923	1985	4327
Quick Sort	98688	415488	1681799

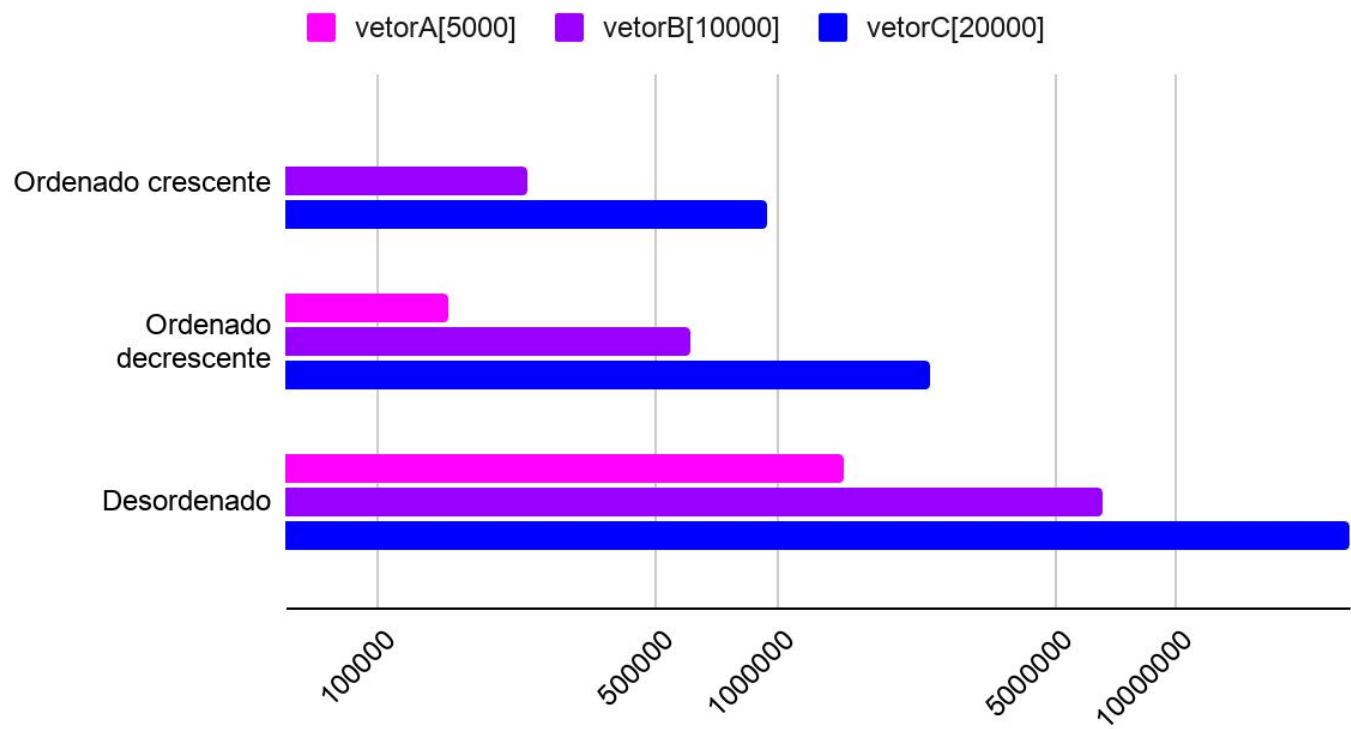
Tempo de ordenação de 10 amostras ordenadas em ordem decrescente em microssegundos



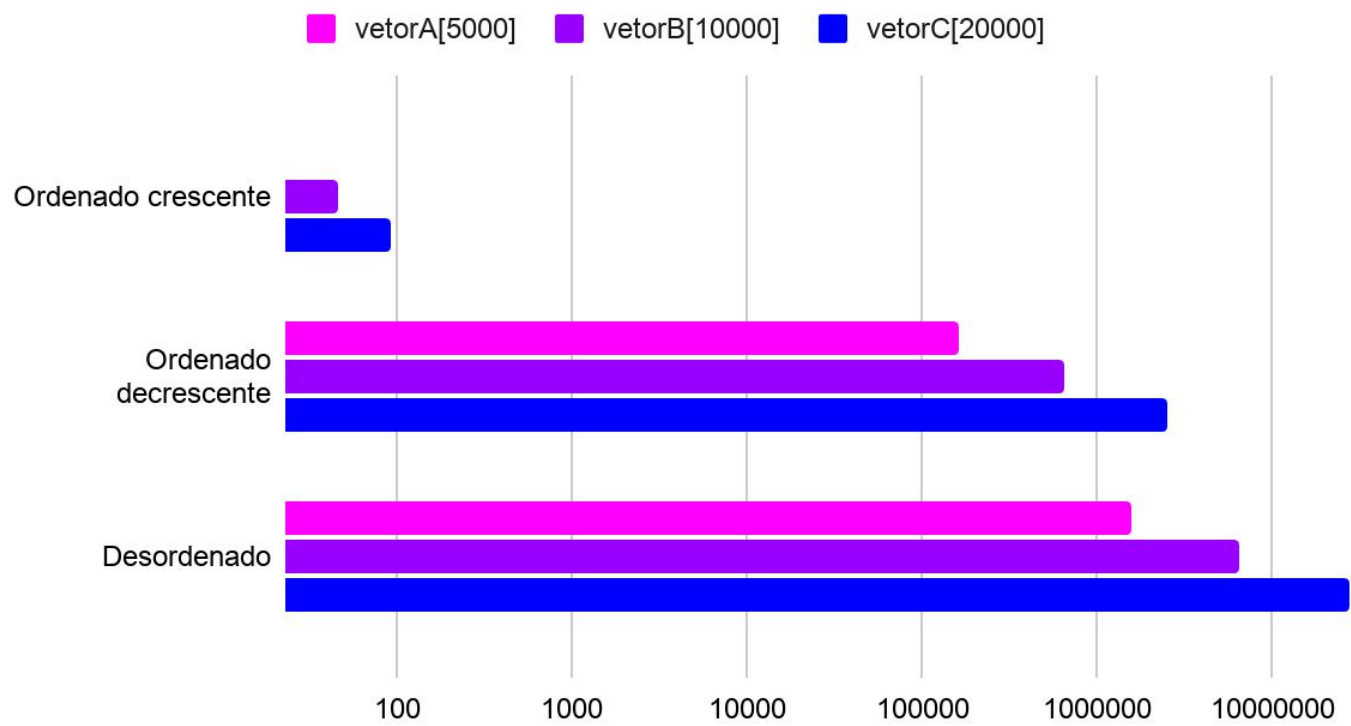
Análise assintótica

Algoritmo	Melhor caso	Pior caso	Caso médio
Bubble Sort	$O(n^2)$	$O(n^2)$	$O(n^2)$
Bubble Sort otimizado	$O(n)$	$O(n^2)$	$O(n^2)$
Quick Sort (pivô a esquerda)	$O(n \cdot \log(n))$	$O(n^2)$	$O(n \cdot \log(n))$
Quick Sort (pivô no centro)	$O(n \cdot \log(n))$	$O(n^2)$	$O(n \cdot \log(n))$
Shell Sort	$O(n \cdot \log(n))$	$O(n^2)$	$O(n \cdot \log n)$
Selection Sort	$O(n^2)$	$O(n^2)$	$O(n^2)$
Heap Sort	$O(n \cdot \log(n))$	$O(n \cdot \log(n))$	$O(n \cdot \log(n))$
Merge Sort	$O(n \cdot \log n)$	$O(n \cdot \log n)$	$O(n \cdot \log n)$

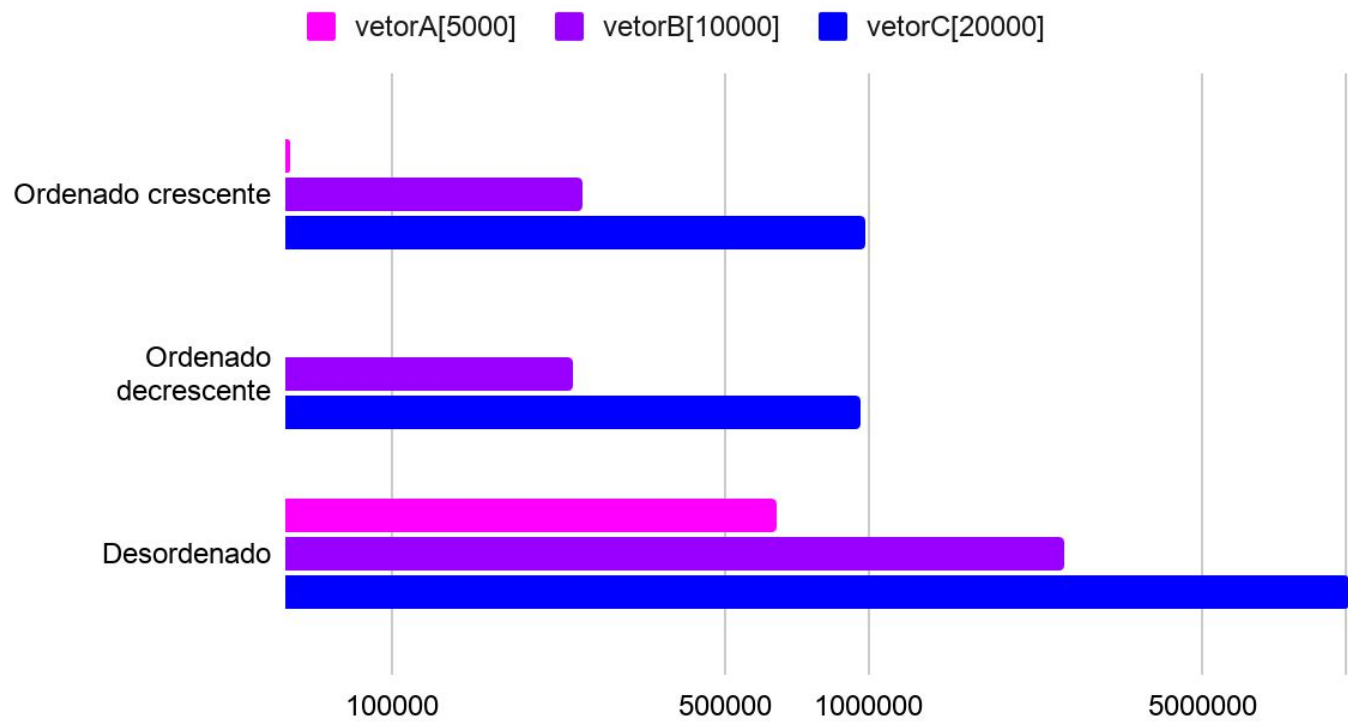
Bubble Sort



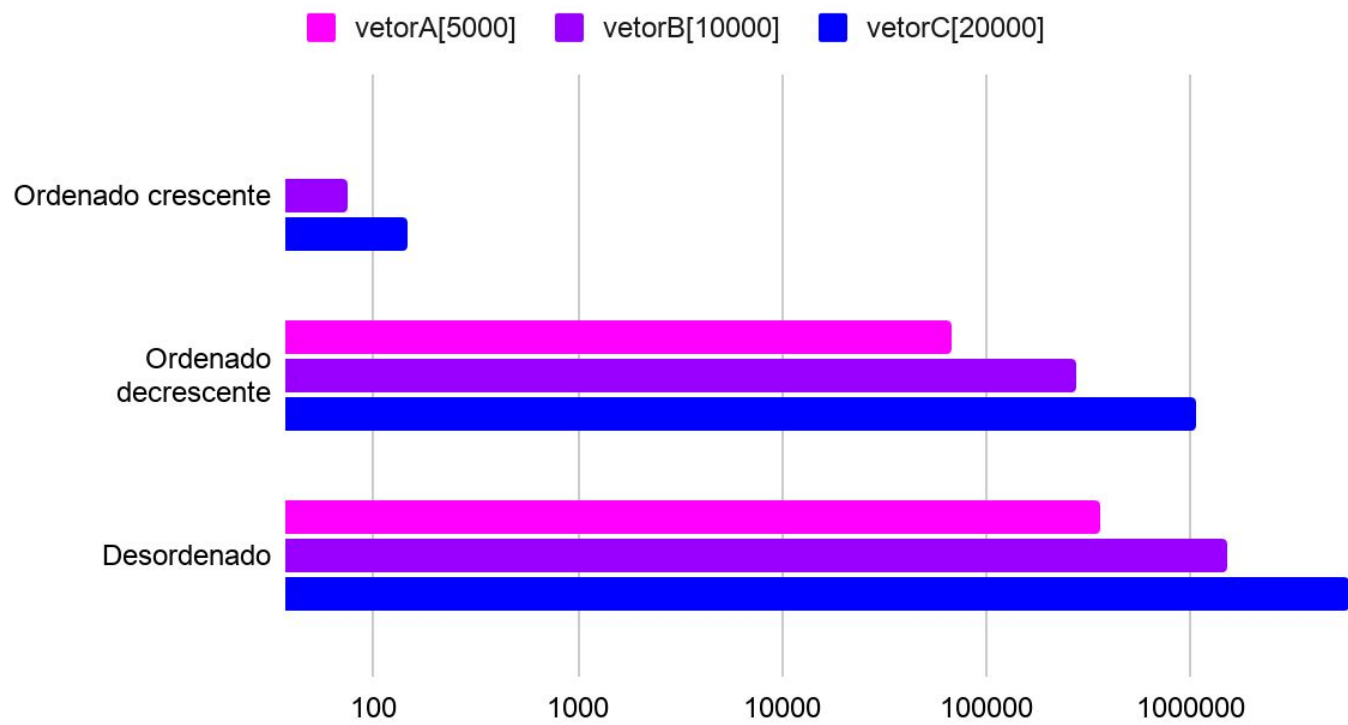
Bubble Sort melhorado



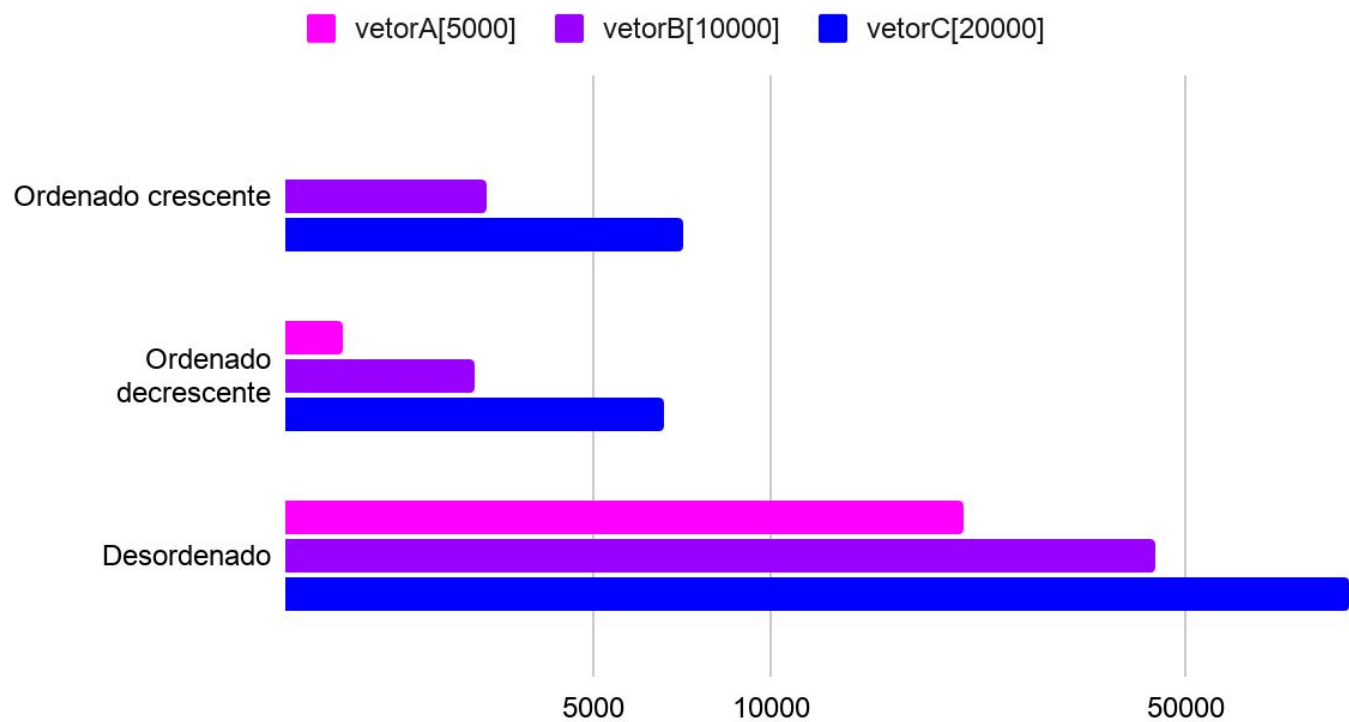
Selection Sort



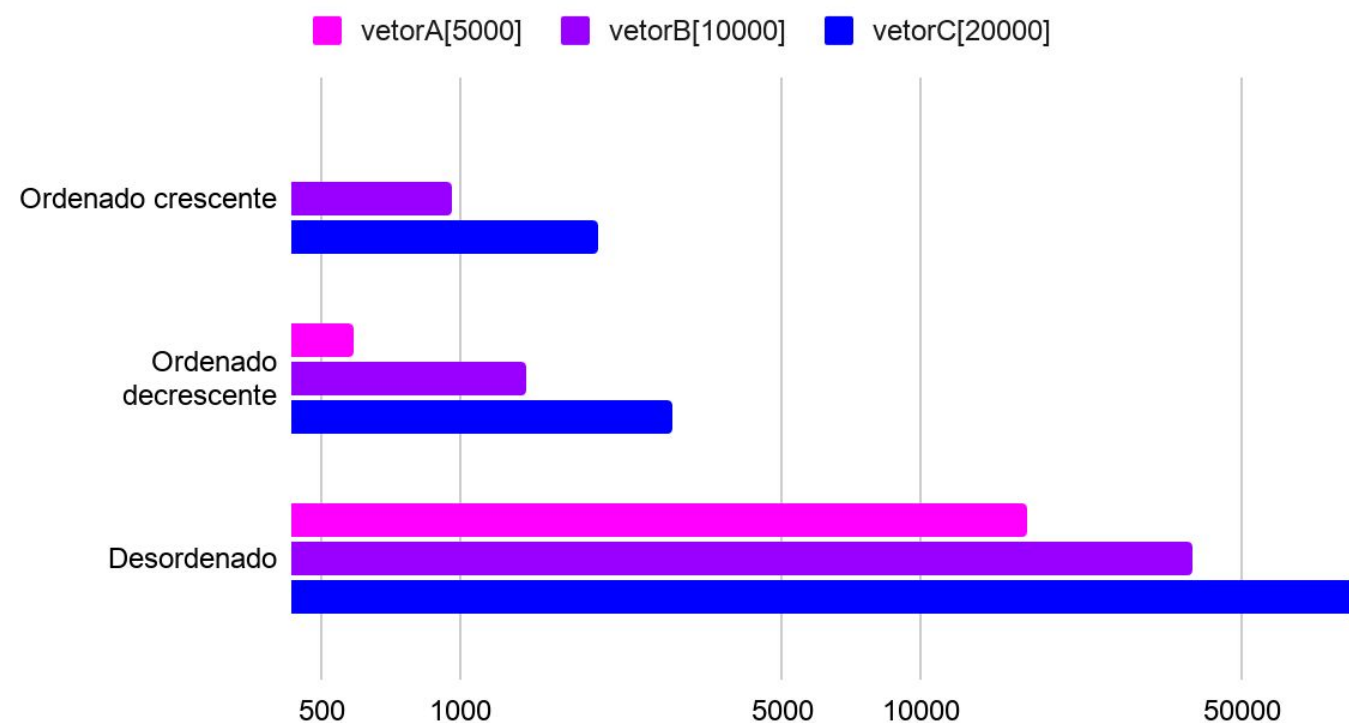
Insertion Sort



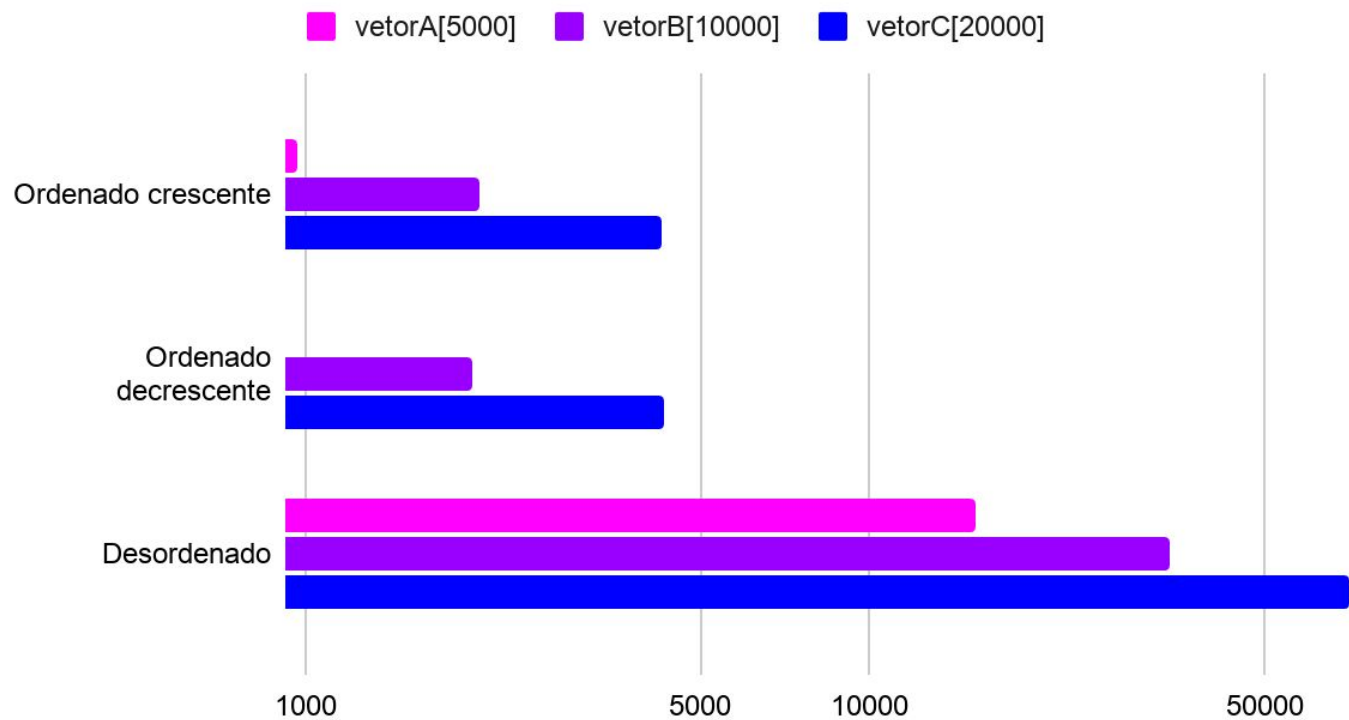
Heap Sort



Shell Sort



Merge Sort



Quick Sort

