











size	merge ascending time	merge descending time	merge random time
50000	0.0061414	0.0181525	0.0327376
123456	0.0143608	0.0145877	0.0301882
300000	0.0374766	0.0373456	0.0769913
314159	0.0392487	0.0391764	0.085812
400000	0.0505987	0.0505758	0.103939
401234	0.0506145	0.0507752	0.104533
500000	0.0773748	0.0816182	0.132411
1000000	0.129426	0.131105	0.27598

size	quick ascending time	quick descending time	quick random time
50000	0.00485555	0.00461833	0.00755115
123456	0.0110998	0.0113998	0.025417
300000	0.027692	0.0275581	0.0649621
314159	0.0287663	0.0286164	0.085276
400000	0.0365836	0.0536731	0.0739445
401234	0.036744	0.0549362	0.0890593
500000	0.0643925	0.0633876	0.090916
1000000	0.100692	0.112239	0.194577

size	selection ascending time	selection descending time	selection random time
50000	3.38544	3.49041	3.60014
55000	4.11476	4.24731	4.35819
65000	5.71231	5.91825	6.083
70000	6.64425	6.83624	7.07407
75000	7.60358	7.85079	8.11607
77500	8.14891	8.37709	8.64438
80000	8.66008	8.92606	9.21032
90000	10.9504	11.2968	11.6676
100000	13.527	13.9463	14.3758

size	insertion descending time	insertion random time	size	insertion ascending time
50000	0.00130257	2.23887	50000	0.000789435
55000	0.00142835	2.69616	123456	0.00194014
65000	0.00168074	3.77888	300000	0.0014503
70000	0.00181263	4.3878	314159	0.00151866
75000	0.00199676	5.04242	400000	0.0019318
77500	0.00202155	5.36215	401234	0.00193896
80000	0.00207749	5.73165	500000	0.00241115
90000	0.00232659	7.23264	1000000	0.00482162
100000	0.00247816	8.95711		

size	bubble descending time	Bubble random time	size	bubble ascending time
50000	15.9217	16.1847	50000	0.000543254
55000	19.2637	19.5778	123456	0.000409883
65000	26.924	27.4871	300000	0.000993579
70000	31.1875	31.8693	314159	0.00103976
75000	35.734	36.5672	400000	0.00132601
77500	38.1646	39.0674	401234	0.00134209
80000	40.666	41.6359	500000	0.00166132
90000	51.6041	52.818	1000000	0.00337572
100000	63.551	65.0879		

Bubble sort

- A. ascending – it seems as though its a $O(n)$ function as from 500000 items to 1000000 items the time in seconds only increased at a factor of 2. The same can be shown for 400000 items to 1000000 items as it increases by a factor of 2.5.
- B. descending- it seems as if its a $O(n^2)$ function as from 50000 items to 100000 items it increases by a factor of 4 even though the items were only increased by a factor of 2.
- C. random - for this one its looks to be $O(N^2)$ because from 50000 items to 100000 items it increases by a factor of 4 even though the items were only increased by a factor of 2.

insertion sort

- A. ascending - $O(N \log N)$
- B. descending – $O(n)$
- C. random – $O(n^2)$

Selection sort

- A. ascending- $O(n^2)$
- B. descending- $O(n^2)$
- C. random- $O(n^2)$

Quick sort

- A. ascending – $O(N)$
- B. descending – $O(N)$
- C. random - $O(N \log N)$

Merge Sort

- A. ascending – $O(N)$
- B. descending- $O(N)$
- C. random – $O(N)$

10million items

Bubble sort

- A. ascending – $O(n)$ - .0337572 seconds
- B. descending- $O(n^2)$ - 635510 seconds
- C. random - $O(N^2)$ - 655510 seconds

insertion sort

- A. ascending - $O(N \log N)$ - .0337572 seconds
- B. descending – $O(n)$ - .24781 seconds
- C. random – $O(n^2)$ – 89571.1 seconds

Selection sort

- A. ascending- $O(n^2)$ – 135270 seconds
- B. descending- $O(n^2)$ – 139463 seconds
- C. random- $O(n^2)$ - 143758 seconds

Quick sort

- A. ascending – $O(N)$ – 1.00692 seconds
- B. descending – $O(N)$ – 1.12239 seconds
- C. random - $O(N \log N)$ – 1.94577 seconds

Merge Sort

- A. ascending – $O(N)$ – 1.29426 seconds
- B. descending- $O(N)$ – 1.31105 seconds
- C. random – $O(N)$ – 2.7598 seconds