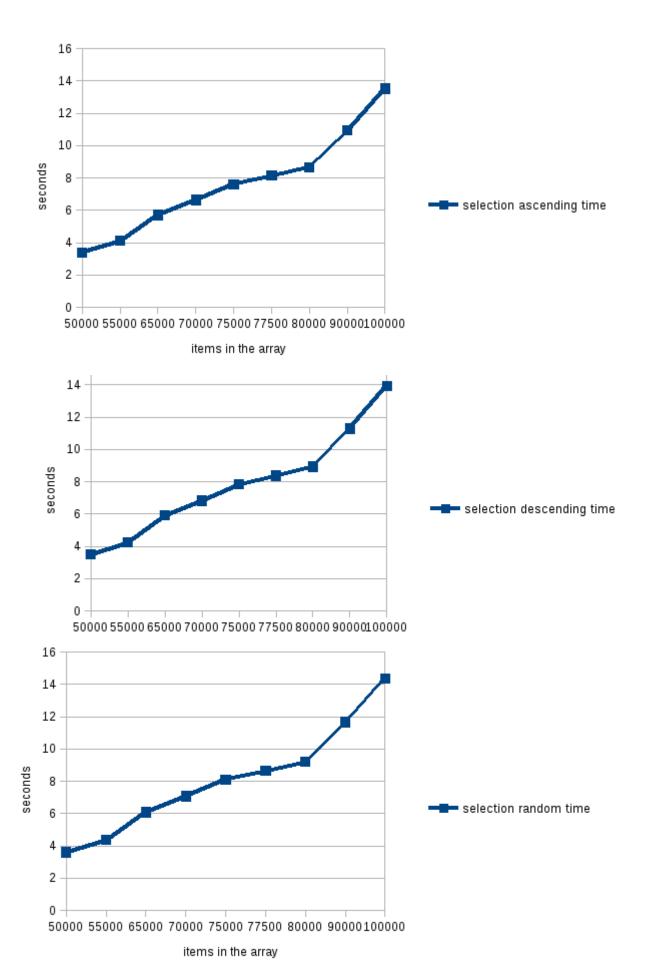
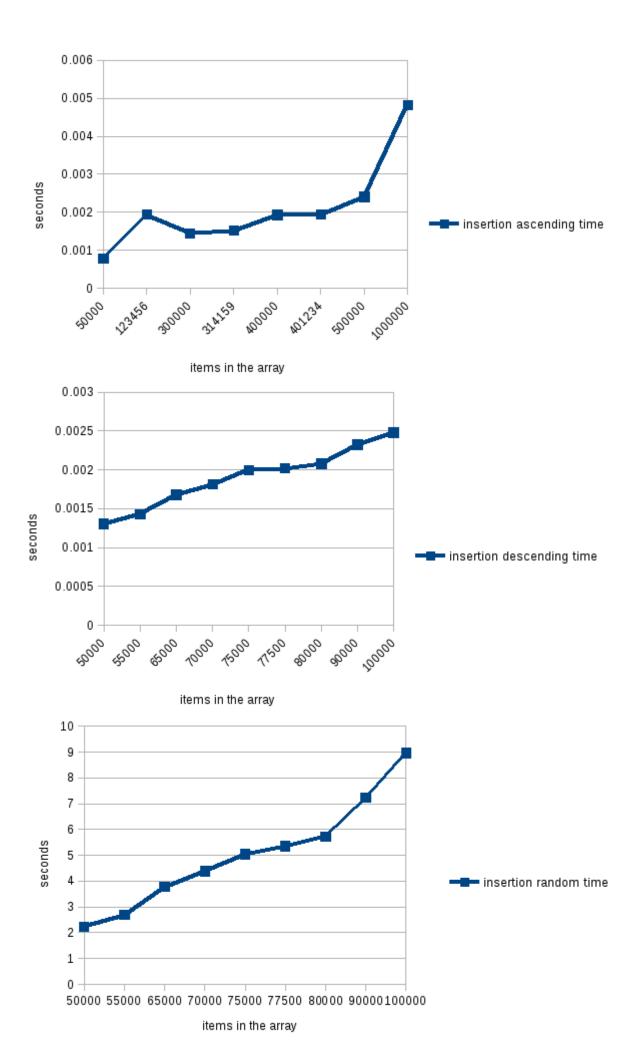
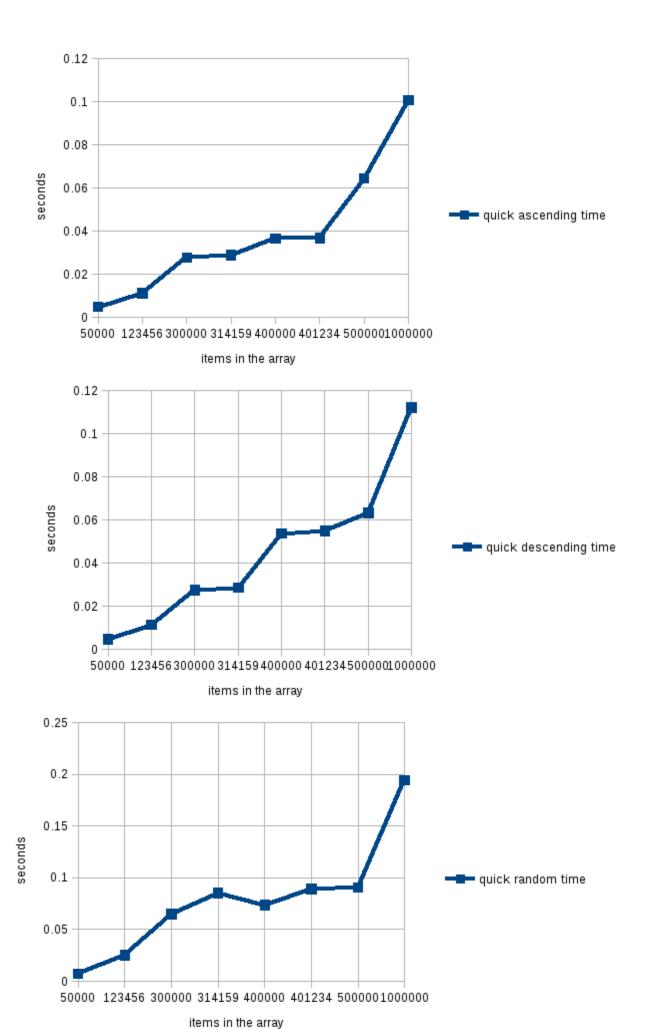
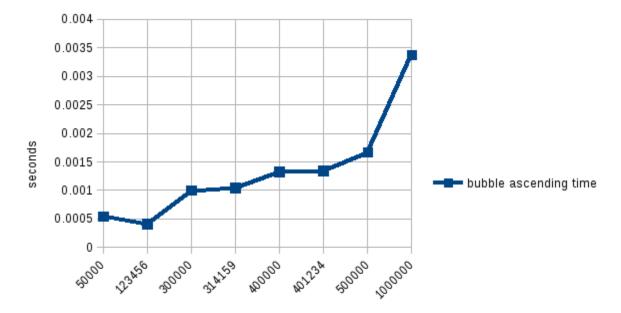


items in the array

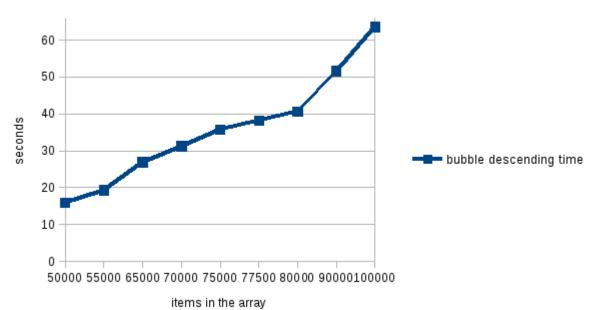


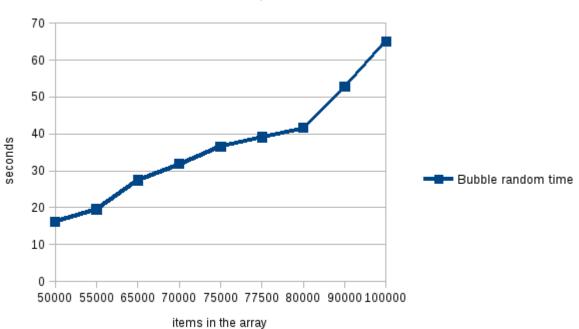






items in the array





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
5000	0.00485555	0.00461833	0.00755115
12345	6 0.0110998	0.0113998	0.025417
30000	0.027692	0.0275581	0.0649621
31415	9 0.0287663	0.0286164	0.085276
40000	0.0365836	0.0536731	0.0739445
40123	0.036744	0.0549362	0.0890593
50000	0.0643925	0.0633876	0.090916
100000	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	
55000	0.00142835	2.69616		
65000	0.00168074	3.77888	123456	
			1 300000	0.0014503
70000	0.00181263	4.3878	314159	
75000	0.00199676	5.04242		
77500			Ι Δ()()()()()	0.0019318
			401234	0.00193896
80000	0.00207749	5.73165	500000	
90000	0.00232659	7.23264		J I
			1000000	0.00482162
100000	0.00247816	8.95711		

size	bubble descending time	Bubble random time
50000	15.9217	16.1847
55000	19.2637	19.5778
65000	26.924	27.4871
70000	31.1875	31.8693
75000	35.734	36.5672
77500	38.1646	39.0674
80000	40.666	41.6359
90000	51.6041	52.818
100000	63.551	65.0879

	size		bubble ascending time
7		50000	0.000543254
3		123456	0.000409883
1		300000	0.000993579
3		314159	0.00103976
2		400000	0.00132601
ļ		401234	0.00134209
)		500000	0.00166132
3		1000000	0.00337572
. 1			

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 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(NlogN)
- 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(NlogN)

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(NlogN) .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(NlogN) 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