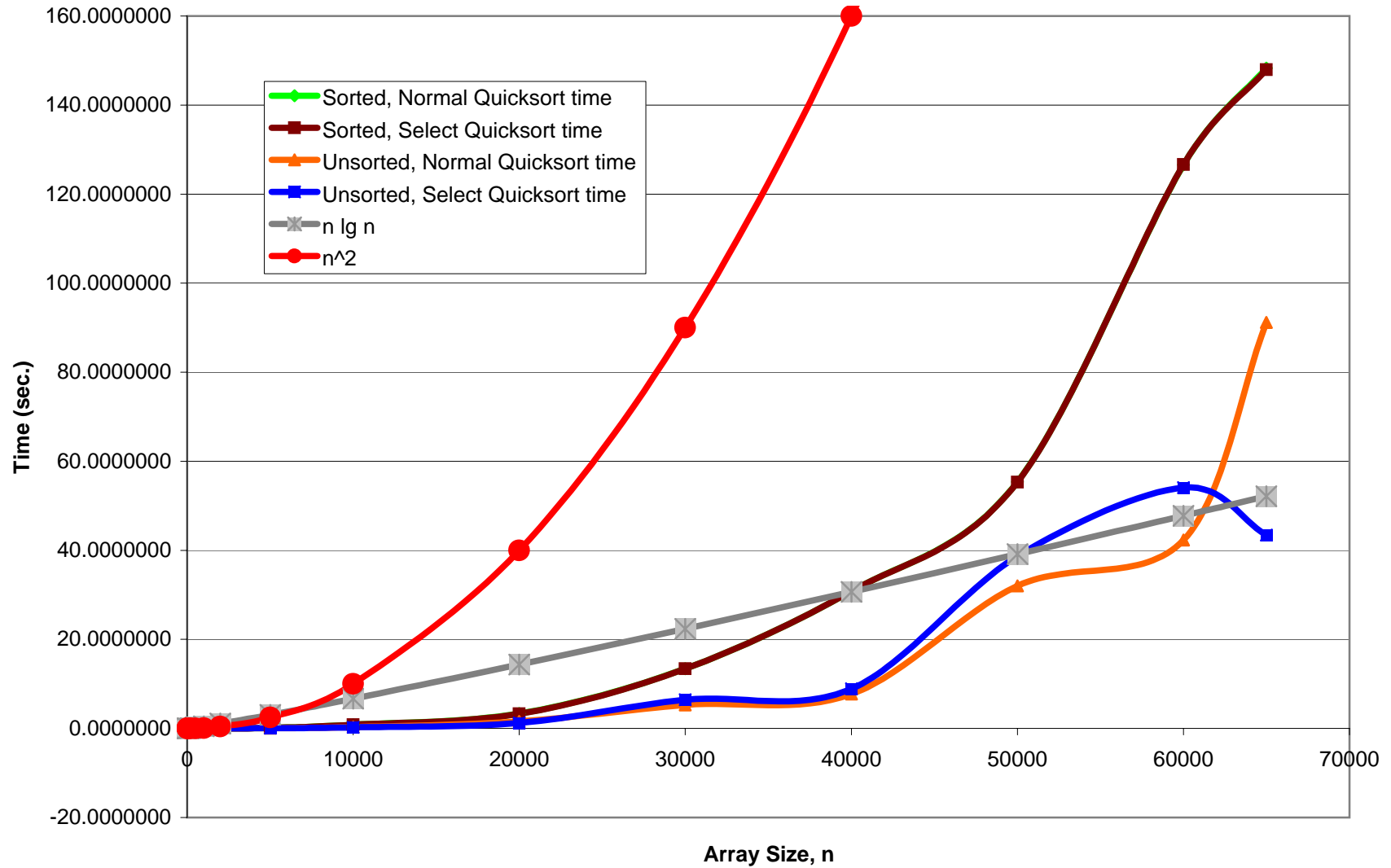


Quicksort Runtimes



Number of Items, n	Sorted, Normal Quicksort time	Sorted, Select Quicksort time	Unsorted, Normal Quicksort time	Unsorted, Select Quicksort time	n lg n	n^2
10	0.0000109	0.0000113	0.0000055	0.0000062	0.0016667	0.00001
20	0.0000211	0.0000205	0.0000127	0.0000111	0.0043368	0.00004
100	0.0000981	0.0000960	0.0000491	0.0000620	0.0333333	0.001
200	0.0003609	0.0003528	0.0001874	0.0001997	0.0767010	0.004
500	0.0013653	0.0013777	0.0009802	0.0008712	0.2249142	0.025
1000	0.0084409	0.0084377	0.0028418	0.0036206	0.5000000	0.1
2000	0.0337916	0.0335627	0.0098026	0.0219247	1.1003433	0.4
5000	0.1327583	0.1325133	0.0662863	0.0497276	3.0824750	2.5
10000	0.8210470	0.8274610	0.3285370	0.2706793	6.6666667	10
20000	3.3340400	3.3184733	1.5700013	1.2360200	14.3367667	40
30000	13.4175000	13.4371000	5.2938233	6.4359733	22.3856063	90
40000	30.8711000	30.8519000	7.7477700	8.8842000	30.6803999	160
50000	55.3669333	55.3149333	32.0495667	38.6679333	39.1580834	250
60000	126.5593333	126.6220000	42.3240000	54.0658333	47.7815125	360
65000	148.3210000	147.9630000	91.1659667	43.4214333	52.1398947	422.5

Worst Case

Average Case

#items	Normal, Sorted	Select, Sorted	Normal, Unsorted	Select, Unsorted
10	0.0000173	0.0000179	0.0000064	0.0000062
10	0.0000075	0.0000080	0.0000051	0.0000053
10	0.0000080	0.0000080	0.0000050	0.0000072
20	0.0000236	0.0000211	0.0000142	0.0000117
20	0.0000202	0.0000202	0.0000106	0.0000102
20	0.0000196	0.0000201	0.0000132	0.0000115
50	0.0001026	0.0000960	0.0000407	0.0000552
50	0.0000960	0.0000959	0.0000350	0.0000720
50	0.0000958	0.0000960	0.0000716	0.0000589
100	0.0003711	0.0003530	0.0001711	0.0001663
100	0.0003525	0.0003526	0.0002654	0.0001519
100	0.0003590	0.0003527	0.0001258	0.0002809
200	0.0013800	0.0013523	0.0011525	0.0009066
200	0.0013619	0.0014295	0.0010900	0.0008956
200	0.0013541	0.0013514	0.0006980	0.0008114
500	0.0083676	0.0083721	0.0022316	0.0029967
500	0.0084526	0.0084764	0.0032220	0.0049596
500	0.0085025	0.0084647	0.0030718	0.0029055
1000	0.0335309	0.0336310	0.0086283	0.0109780
1000	0.0340144	0.0340642	0.0112448	0.0296373
1000	0.0338294	0.0329930	0.0095347	0.0251588
2000	0.1328420	0.1328590	0.0489833	0.0567565
2000	0.1315430	0.1300670	0.0397215	0.0476999
2000	0.1338900	0.1346140	0.1101540	0.0447265
5000	0.8310330	0.8240850	0.4588460	0.2936740
5000	0.8186730	0.8372960	0.1714790	0.1895700
5000	0.8134350	0.8210020	0.3552860	0.3287940
10000	3.3358300	3.3469800	1.6755800	2.0440800
10000	3.3331500	3.3270600	2.2735300	0.6700980
10000	3.3331400	3.2813800	0.7608940	0.9938820
20000	13.4116000	13.5294000	4.8636800	6.4106300
20000	13.3744000	13.4761000	5.2664300	5.3718700
20000	13.4665000	13.3058000	5.7513600	7.5254200
30000	30.7870000	30.7779000	7.8053200	8.3809700
30000	30.9993000	30.9821000	5.3911900	5.1064300
30000	30.8270000	30.7957000	10.0468000	13.1652000
40000	55.5858000	55.4347000	54.2075000	43.6383000
40000	55.1785000	55.1941000	31.5566000	16.6382000
40000	55.3365000	55.3160000	10.3846000	55.7273000
50000	87.4429000	87.1866000	50.8257000	40.3356000
50000	87.3693000	87.0223000	35.9047000	22.2994000
50000	87.2005000	87.5217000	47.1350000	84.6389000
60000	127.2050000	126.8450000	36.4357000	32.9763000
60000	126.2970000	126.6110000	52.6509000	32.7439000
60000	126.1760000	126.4100000	37.8854000	96.4773000
65000	147.8920000	147.1150000	68.1589000	58.6417000
65000	148.6750000	149.0940000	102.5750000	41.1617000
65000	148.3960000	147.6800000	102.7640000	30.4609000