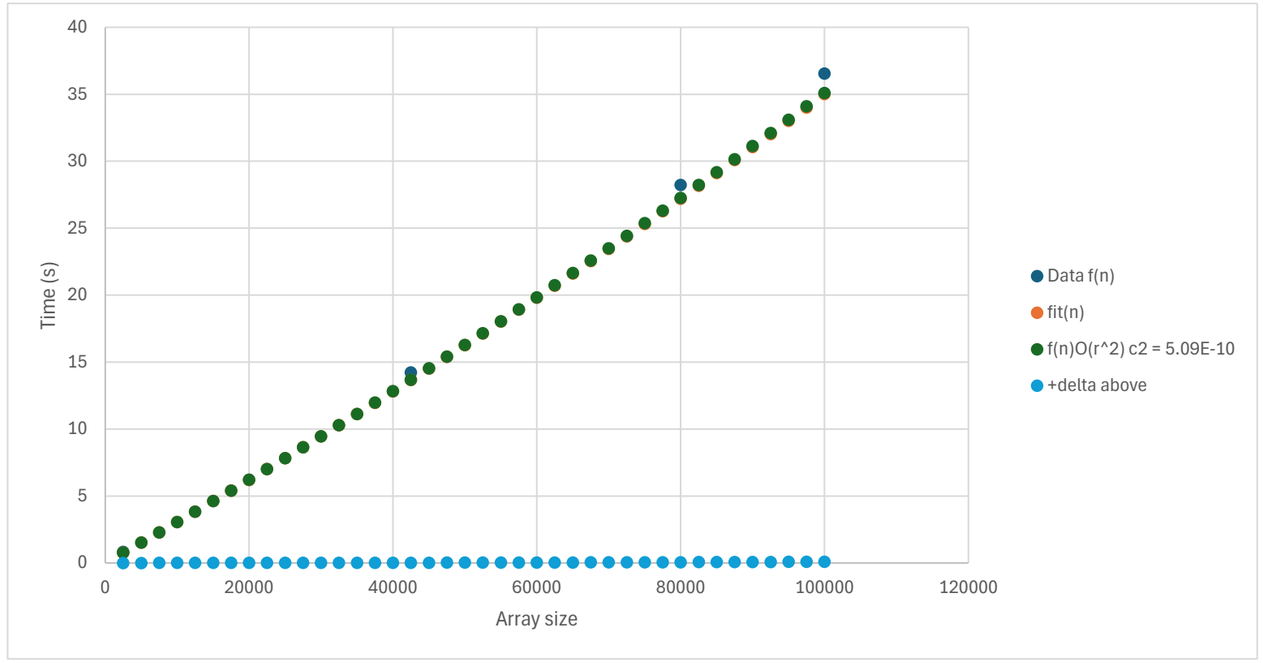
Heap sort Timing analysis

| r^0 | Array Size | r^2 | Data f(n) | fitf(n) |
|---|---|---|---|---|
| 1 | 2500 | 6250000 | 0.82676 | 0.75743 |
| 1 | 42500 | 1806250000 | 14.2289 | 13.65743 |
| 1 | 80000 | 6400000000 | 28.2259 | 27.20430 |
| 1 | 100000 | 10000000000 | 36.5469 | 35.00430 |

| r^0 | Array Size | r^2 | Time(s) | f(n)O(r^2) c2 = 5.09E-10 | fit(n) | +Delta Above |
|---|---|---|---|---|---|---|
| 1 | 2500 | 6250000 | 0.82676 | 0.75748 | 0.75743 | 0.00006 |
| 1 | 5000 | 25000000 | 1.50436 | 1.51703 | 1.51680 | 0.00023 |
| 1 | 7500 | 56250000 | 2.17986 | 2.28293 | 2.28243 | 0.00051 |
| 1 | 10000 | 100000000 | 2.8948 | 3.05520 | 3.05430 | 0.00090 |
| 1 | 12500 | 156250000 | 4.0061 | 3.83383 | 3.83243 | 0.00141 |
| 1 | 15000 | 225000000 | 4.66568 | 4.61883 | 4.61680 | 0.00203 |
| 1 | 17500 | 306250000 | 6.07978 | 5.41018 | 5.40743 | 0.00276 |
| 1 | 20000 | 400000000 | 6.31152 | 6.20790 | 6.20430 | 0.00360 |
| 1 | 22500 | 506250000 | 7.8962 | 7.01198 | 7.00743 | 0.00456 |
| 1 | 25000 | 625000000 | 8.55102 | 7.82243 | 7.81680 | 0.00563 |
| 1 | 27500 | 756250000 | 9.60378 | 8.63923 | 8.63243 | 0.00681 |
| 1 | 30000 | 900000000 | 10.3433 | 9.46240 | 9.45430 | 0.00810 |
| 1 | 32500 | 1056250000 | 10.7493 | 10.29193 | 10.28243 | 0.00951 |
| 1 | 35000 | 1225000000 | 11.8592 | 11.12783 | 11.11680 | 0.01103 |
| 1 | 37500 | 1406250000 | 12.7251 | 11.97008 | 11.95743 | 0.01266 |
| 1 | 40000 | 1600000000 | 14.1757 | 12.81870 | 12.80430 | 0.01440 |
| 1 | 42500 | 1806250000 | 14.2289 | 13.67368 | 13.65743 | 0.01626 |
| 1 | 45000 | 2025000000 | 15.2592 | 14.53503 | 14.51680 | 0.01823 |
| 1 | 47500 | 2256250000 | 16.6465 | 15.40273 | 15.38243 | 0.02031 |
| 1 | 50000 | 2500000000 | 17.846 | 16.27680 | 16.25430 | 0.02250 |
| 1 | 52500 | 2756250000 | 18.5685 | 17.15723 | 17.13243 | 0.02481 |
| 1 | 55000 | 3025000000 | 19.5253 | 18.04403 | 18.01680 | 0.02723 |
| 1 | 57500 | 3306250000 | 19.9721 | 18.93718 | 18.90743 | 0.02976 |
| 1 | 60000 | 3600000000 | 20.6077 | 19.83670 | 19.80430 | 0.03240 |
| 1 | 62500 | 3906250000 | 21.5665 | 20.74258 | 20.70743 | 0.03516 |
| 1 | 65000 | 4225000000 | 22.8628 | 21.65483 | 21.61680 | 0.03803 |
| 1 | 67500 | 4556250000 | 24.8122 | 22.57343 | 22.53243 | 0.04101 |
| 1 | 70000 | 4900000000 | 24.7718 | 23.49840 | 23.45430 | 0.04410 |
| 1 | 72500 | 5256250000 | 25.3446 | 24.42973 | 24.38243 | 0.04731 |
| 1 | 75000 | 5625000000 | 26.7776 | 25.36743 | 25.31680 | 0.05063 |
| 1 | 77500 | 6006250000 | 27.6775 | 26.31148 | 26.25743 | 0.05406 |
| 1 | 80000 | 6400000000 | 28.2259 | 27.26190 | 27.20430 | 0.05760 |
| 1 | 82500 | 6806250000 | 28.6355 | 28.21868 | 28.15743 | 0.06126 |
| 1 | 85000 | 7225000000 | 29.4006 | 29.18183 | 29.11680 | 0.06502 |
| 1 | 87500 | 7656250000 | 31.2556 | 30.15133 | 30.08243 | 0.06891 |
| 1 | 90000 | 8100000000 | 32.0948 | 31.12720 | 31.05430 | 0.07290 |
| 1 | 92500 | 8556250000 | 32.984 | 32.10943 | 32.03243 | 0.07701 |
| 1 | 95000 | 9025000000 | 33.8605 | 33.09803 | 33.01680 | 0.08123 |
| 1 | 97500 | 9506250000 | 39.8167 | 34.09298 | 34.00743 | 0.08556 |
| 1 | 100000 | 10000000000 | 36.5469 | 35.09430 | 35.00430 | 0.09000 |




f(n) =c0*x^0 + c1*x^1 + c2 *x^2

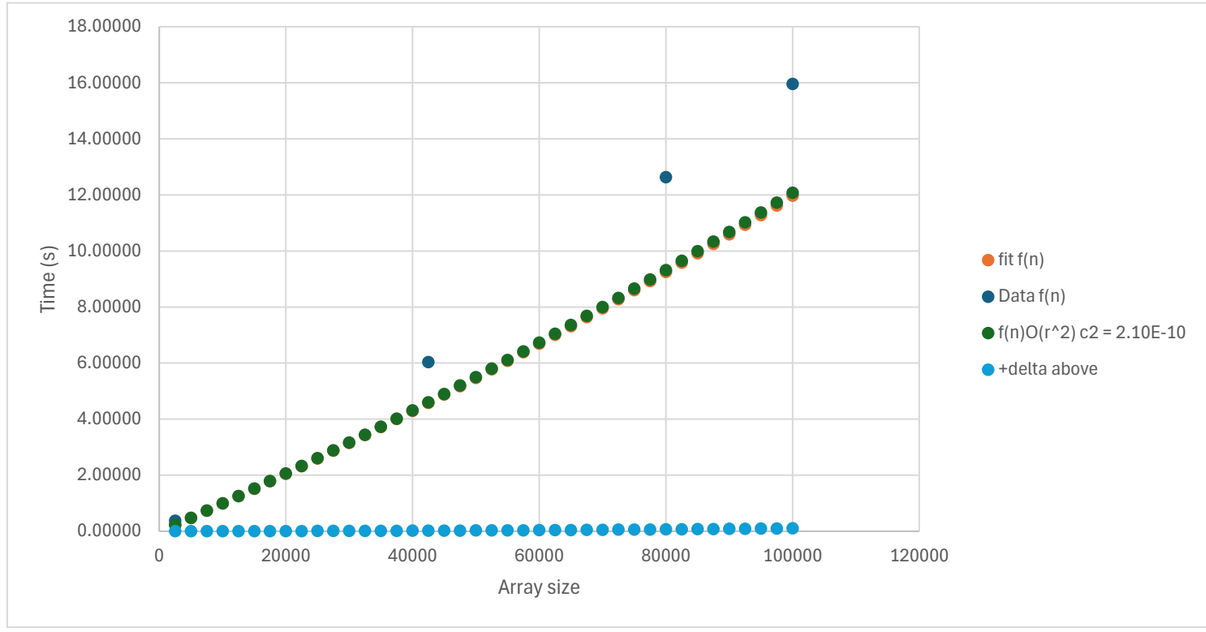
f(n) =c0*r^0 + c1*r^1 + c2 *r^2

| | |
|---|---|
| c0 = | 0.0043 |
| c1 = | 0.0003 |
| c2 = | 5.00E-10 |

quick sort Timing analysis

| r^0 | Array Size | r^2 | Data f(n) | fitf(n) |
|---|---|---|---|---|
| 1 | 2500 | 6250000 | 0.36934 | 0.22145 |
| 1 | 42500 | 1806250000 | 6.03562 | 4.58145 |
| 1 | 80000 | 6400000000 | 12.6289 | 9.25020 |
| 1 | 100000 | 10000000000 | 15.952 | 11.97020 |

| r^0 | Array Size | r^2 | Time (s) | f(n)O(r^2) c2 = 2.10E-10 | fit(n) | -Delta Above |
|---|---|---|---|---|---|---|
| 1 | 2500 | 6250000 | 0.36934 | 0.22151 | 0.22145 | 0.00006 |
| 1 | 5000 | 25000000 | 0.62912 | 0.47545 | 0.47520 | 0.00025 |
| 1 | 7500 | 56250000 | 0.86974 | 0.73201 | 0.73145 | 0.00056 |
| 1 | 10000 | 100000000 | 1.2499 | 0.99120 | 0.99020 | 0.00100 |
| 1 | 12500 | 156250000 | 1.7095 | 1.25301 | 1.25145 | 0.00156 |
| 1 | 15000 | 225000000 | 1.93212 | 1.51745 | 1.51520 | 0.00225 |
| 1 | 17500 | 306250000 | 2.612 | 1.78451 | 1.78145 | 0.00306 |
| 1 | 20000 | 400000000 | 2.80022 | 2.05420 | 2.05020 | 0.00400 |
| 1 | 22500 | 506250000 | 3.80878 | 2.32651 | 2.32145 | 0.00506 |
| 1 | 25000 | 625000000 | 3.75224 | 2.60145 | 2.59520 | 0.00625 |
| 1 | 27500 | 756250000 | 4.0253 | 2.87901 | 2.87145 | 0.00756 |
| 1 | 30000 | 900000000 | 4.19516 | 3.15920 | 3.15020 | 0.00900 |
| 1 | 32500 | 1056250000 | 4.68614 | 3.44201 | 3.43145 | 0.01056 |
| 1 | 35000 | 1225000000 | 4.9677 | 3.72745 | 3.71520 | 0.01225 |
| 1 | 37500 | 1406250000 | 5.5918 | 4.01551 | 4.00145 | 0.01406 |
| 1 | 40000 | 1600000000 | 5.97982 | 4.30620 | 4.29020 | 0.01600 |
| 1 | 42500 | 1806250000 | 6.03562 | 4.59951 | 4.58145 | 0.01806 |
| 1 | 45000 | 2025000000 | 6.50756 | 4.89545 | 4.87520 | 0.02025 |
| 1 | 47500 | 2256250000 | 7.0292 | 5.19401 | 5.17145 | 0.02256 |
| 1 | 50000 | 2500000000 | 7.72128 | 5.49520 | 5.47020 | 0.02500 |
| 1 | 52500 | 2756250000 | 7.85002 | 5.79901 | 5.77145 | 0.02756 |
| 1 | 55000 | 3025000000 | 8.3102 | 6.10545 | 6.07520 | 0.03025 |
| 1 | 57500 | 3306250000 | 8.9134 | 6.41451 | 6.38145 | 0.03306 |
| 1 | 60000 | 3600000000 | 8.89028 | 6.72620 | 6.69020 | 0.03600 |
| 1 | 62500 | 3906250000 | 9.3656 | 7.04051 | 7.00145 | 0.03906 |
| 1 | 65000 | 4225000000 | 9.71172 | 7.35745 | 7.31520 | 0.04225 |
| 1 | 67500 | 4556250000 | 10.2744 | 7.67701 | 7.63145 | 0.04556 |
| 1 | 70000 | 4900000000 | 10.6094 | 7.99920 | 7.95020 | 0.04900 |
| 1 | 72500 | 5256250000 | 10.9828 | 8.32401 | 8.27145 | 0.05256 |
| 1 | 75000 | 5625000000 | 11.8325 | 8.65145 | 8.59520 | 0.05625 |
| 1 | 77500 | 6006250000 | 11.5932 | 8.98151 | 8.92145 | 0.06006 |
| 1 | 80000 | 6400000000 | 12.6289 | 9.31420 | 9.25020 | 0.06400 |
| 1 | 82500 | 6806250000 | 12.5635 | 9.64951 | 9.58145 | 0.06806 |
| 1 | 85000 | 7225000000 | 13.0714 | 9.98745 | 9.91520 | 0.07225 |
| 1 | 87500 | 7656250000 | 13.373 | 10.32801 | 10.25145 | 0.07656 |
| 1 | 90000 | 8100000000 | 14.1582 | 10.67120 | 10.59020 | 0.08100 |
| 1 | 92500 | 8556250000 | 14.3393 | 11.01701 | 10.93145 | 0.08556 |
| 1 | 95000 | 9025000000 | 14.8696 | 11.36545 | 11.27520 | 0.09025 |
| 1 | 97500 | 9506250000 | 15.7241 | 11.71651 | 11.62145 | 0.09506 |
| 1 | 100000 | 10000000000 | 15.952 | 12.07020 | 11.97020 | 0.10000 |




f(n) =c0*x^0 + c1*x^1 + c2 *x^2

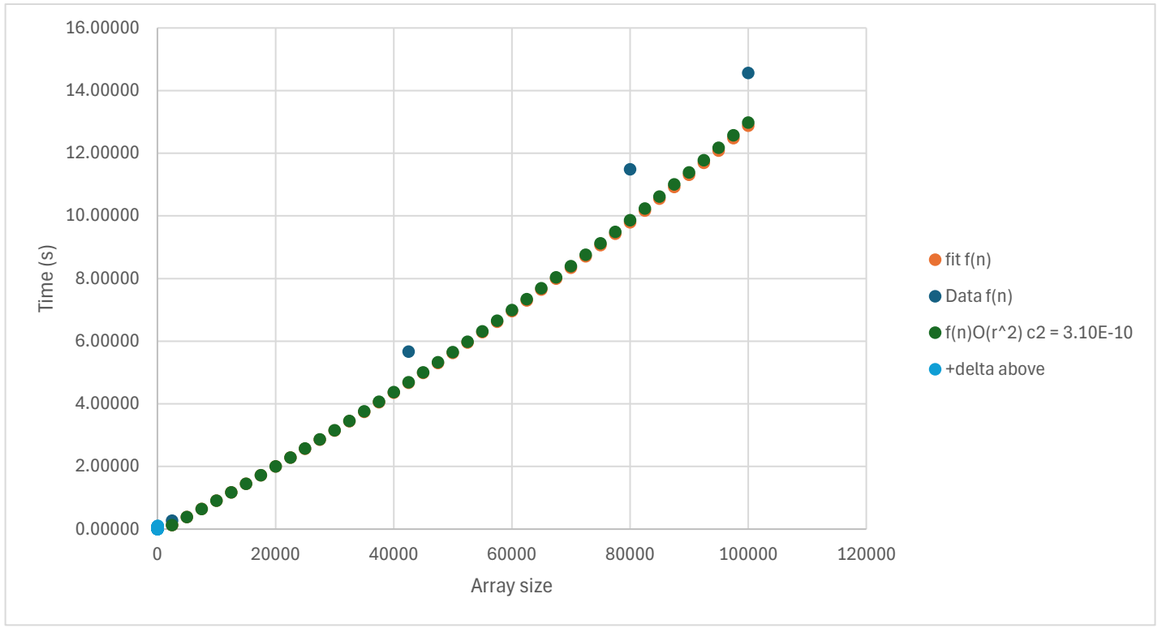
f(n) =c0*r^0 + c1*r^1 + c2 *r^2

| | |
|---|---|
| c0 = | -0.0298 |
| c1 = | 0.0001 |
| c2 = | 2.00E-10 |

Shell sort Timing analysis

| r^0 | Array Size | r^2 | Data f(n) | fitf(n) |
|---|---|---|---|---|
| 1 | 2500 | 6250000 | 0.27344 | 0.13078 |
| 1 | 42500 | 1806250000 | 5.66862 | 4.67078 |
| 1 | 80000 | 6400000000 | 11.4893 | 9.79890 |
| 1 | 100000 | 10000000000 | 14.5615 | 12.87890 |

| r^0 | Array Size | r^2 | Time (s) | f(n)O(r^2) c2 = 3.10E-10 | fit(n) | -Delta Above |
|---|---|---|---|---|---|---|
| 1 | 2500 | 6250000 | 0.27344 | 0.13084 | 0.13078 | 0.00006 |
| 1 | 5000 | 25000000 | 0.4934 | 0.38665 | 0.38640 | 0.00025 |
| 1 | 7500 | 56250000 | 0.73156 | 0.64634 | 0.64578 | 0.00056 |
| 1 | 10000 | 100000000 | 0.99854 | 0.90990 | 0.90890 | 0.00100 |
| 1 | 12500 | 156250000 | 1.34026 | 1.17734 | 1.17578 | 0.00156 |
| 1 | 15000 | 225000000 | 1.56248 | 1.44865 | 1.44640 | 0.00225 |
| 1 | 17500 | 306250000 | 2.02786 | 1.72384 | 1.72078 | 0.00306 |
| 1 | 20000 | 400000000 | 2.51556 | 2.00290 | 1.99890 | 0.00400 |
| 1 | 22500 | 506250000 | 3.12534 | 2.28584 | 2.28078 | 0.00506 |
| 1 | 25000 | 625000000 | 2.96022 | 2.57265 | 2.56640 | 0.00625 |
| 1 | 27500 | 756250000 | 3.2155 | 2.86334 | 2.85578 | 0.00756 |
| 1 | 30000 | 900000000 | 3.5322 | 3.15790 | 3.14890 | 0.00900 |
| 1 | 32500 | 1056250000 | 3.91238 | 3.45634 | 3.44578 | 0.01056 |
| 1 | 35000 | 1225000000 | 4.40504 | 3.75865 | 3.74640 | 0.01225 |
| 1 | 37500 | 1406250000 | 4.71676 | 4.06484 | 4.05078 | 0.01406 |
| 1 | 40000 | 1600000000 | 5.1759 | 4.37490 | 4.35890 | 0.01600 |
| 1 | 42500 | 1806250000 | 5.66862 | 4.68884 | 4.67078 | 0.01806 |
| 1 | 45000 | 2025000000 | 5.66206 | 5.00665 | 4.98640 | 0.02025 |
| 1 | 47500 | 2256250000 | 6.11702 | 5.32834 | 5.30578 | 0.02256 |
| 1 | 50000 | 2500000000 | 6.70814 | 5.65390 | 5.62890 | 0.02500 |
| 1 | 52500 | 2756250000 | 6.56212 | 5.98334 | 5.95578 | 0.02756 |
| 1 | 55000 | 3025000000 | 7.26002 | 6.31665 | 6.28640 | 0.03025 |
| 1 | 57500 | 3306250000 | 7.90416 | 6.65384 | 6.62078 | 0.03306 |
| 1 | 60000 | 3600000000 | 7.88838 | 6.99490 | 6.95890 | 0.03600 |
| 1 | 62500 | 3906250000 | 8.35612 | 7.33984 | 7.30078 | 0.03906 |
| 1 | 65000 | 4225000000 | 8.8764 | 7.68865 | 7.64640 | 0.04225 |
| 1 | 67500 | 4556250000 | 9.05164 | 8.04134 | 7.99578 | 0.04556 |
| 1 | 70000 | 4900000000 | 9.25194 | 8.39790 | 8.34890 | 0.04900 |
| 1 | 72500 | 5256250000 | 9.52196 | 8.75834 | 8.70578 | 0.05256 |
| 1 | 75000 | 5625000000 | 10.0095 | 9.12265 | 9.06640 | 0.05625 |
| 1 | 77500 | 6006250000 | 10.4334 | 9.49084 | 9.43078 | 0.06006 |
| 1 | 80000 | 6400000000 | 11.4893 | 9.86290 | 9.79890 | 0.06400 |
| 1 | 82500 | 6806250000 | 11.6898 | 10.23884 | 10.17078 | 0.06806 |
| 1 | 85000 | 7225000000 | 12.5771 | 10.61865 | 10.54640 | 0.07225 |
| 1 | 87500 | 7656250000 | 11.7978 | 11.00234 | 10.92578 | 0.07656 |
| 1 | 90000 | 8100000000 | 12.5278 | 11.38990 | 11.30890 | 0.08100 |
| 1 | 92500 | 8556250000 | 12.6608 | 11.78134 | 11.69578 | 0.08556 |
| 1 | 95000 | 9025000000 | 13.7492 | 12.17665 | 12.08640 | 0.09025 |
| 1 | 97500 | 9506250000 | 13.9102 | 12.57584 | 12.48078 | 0.09506 |
| 1 | 100000 | 10000000000 | 14.5615 | 12.97890 | 12.87890 | 0.10000 |




f(n) =c0*x^0 + c1*x^1 + c2 *x^2

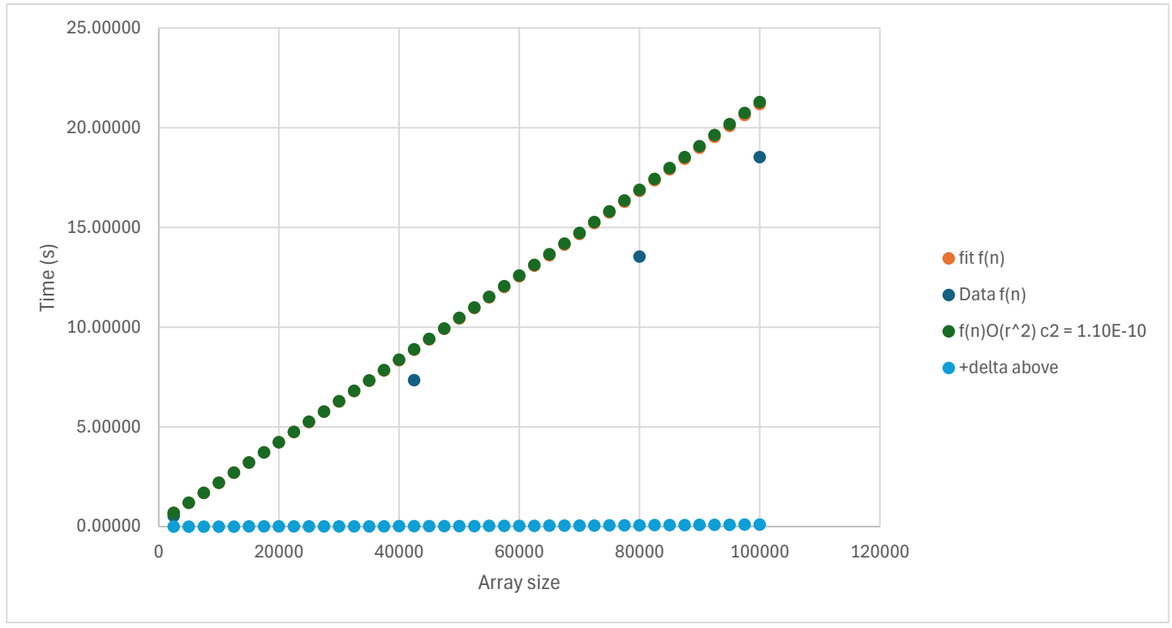
f(n) =c0*r^0 + c1*r^1 + c2 *r^2

| | |
|---|---|
| c0 = | -0.1211 |
| c1 = | 0.0001 |
| c2 = | 3.00E-10 |

Merge sort Timing analysis

| r^0 | Array Size | r^2 | Data f(n) | fitf(n) |
|---|---|---|---|---|
| 1 | 2500 | 6250000 | 0.52364 | 0.68653 |
| 1 | 42500 | 1806250000 | 7.34286 | 8.86653 |
| 1 | 80000 | 6400000000 | 13.5318 | 16.82590 |
| 1 | 100000 | 10000000000 | 18.5286 | 21.18590 |

| r^0 | Array Size | r^2 | Time(s) | f(n)O(r^2) c2 = 1.10E-10 | fit(n) | +Delta Above |
|---|---|---|---|---|---|---|
| 1 | 2500 | 6250000 | 0.52364 | 0.68659 | 0.68653 | 0.00006 |
| 1 | 5000 | 25000000 | 0.83122 | 1.18865 | 1.18840 | 0.00025 |
| 1 | 7500 | 56250000 | 1.12750 | 1.69209 | 1.69153 | 0.00056 |
| 1 | 10000 | 100000000 | 1.54116 | 2.19690 | 2.19590 | 0.00100 |
| 1 | 12500 | 156250000 | 2.04236 | 2.70309 | 2.70153 | 0.00156 |
| 1 | 15000 | 225000000 | 2.44338 | 3.21065 | 3.20840 | 0.00225 |
| 1 | 17500 | 306250000 | 2.99046 | 3.71959 | 3.71653 | 0.00306 |
| 1 | 20000 | 400000000 | 3.75472 | 4.22990 | 4.22590 | 0.00400 |
| 1 | 22500 | 506250000 | 4.41028 | 4.74159 | 4.73653 | 0.00506 |
| 1 | 25000 | 625000000 | 4.21694 | 5.25465 | 5.24840 | 0.00625 |
| 1 | 27500 | 756250000 | 5.08744 | 5.76909 | 5.76153 | 0.00756 |
| 1 | 30000 | 900000000 | 5.10000 | 6.28490 | 6.27590 | 0.00900 |
| 1 | 32500 | 1056250000 | 5.43350 | 6.80209 | 6.79153 | 0.01056 |
| 1 | 35000 | 1225000000 | 5.89136 | 7.32065 | 7.30840 | 0.01225 |
| 1 | 37500 | 1406250000 | 6.43230 | 7.84059 | 7.82653 | 0.01406 |
| 1 | 40000 | 1600000000 | 6.58486 | 8.36190 | 8.34590 | 0.01600 |
| 1 | 42500 | 1806250000 | 7.34286 | 8.88459 | 8.86653 | 0.01806 |
| 1 | 45000 | 2025000000 | 7.36816 | 9.40865 | 9.38840 | 0.02025 |
| 1 | 47500 | 2256250000 | 8.11074 | 9.93409 | 9.91153 | 0.02256 |
| 1 | 50000 | 2500000000 | 9.07810 | 10.46090 | 10.43590 | 0.02500 |
| 1 | 52500 | 2756250000 | 9.27926 | 10.98909 | 10.96153 | 0.02756 |
| 1 | 55000 | 3025000000 | 9.61000 | 11.51865 | 11.48840 | 0.03025 |
| 1 | 57500 | 3306250000 | 9.61794 | 12.04959 | 12.01653 | 0.03306 |
| 1 | 60000 | 3600000000 | 9.84084 | 12.58190 | 12.54590 | 0.03600 |
| 1 | 62500 | 3906250000 | 10.68760 | 13.11559 | 13.07653 | 0.03906 |
| 1 | 65000 | 4225000000 | 11.32680 | 13.65065 | 13.60840 | 0.04225 |
| 1 | 67500 | 4556250000 | 11.48720 | 14.18709 | 14.14153 | 0.04556 |
| 1 | 70000 | 4900000000 | 11.82480 | 14.72490 | 14.67590 | 0.04900 |
| 1 | 72500 | 5256250000 | 12.33690 | 15.26409 | 15.21153 | 0.05256 |
| 1 | 75000 | 5625000000 | 12.57940 | 15.80465 | 15.74840 | 0.05625 |
| 1 | 77500 | 6006250000 | 13.26270 | 16.34659 | 16.28653 | 0.06006 |
| 1 | 80000 | 6400000000 | 13.53180 | 16.88990 | 16.82590 | 0.06400 |
| 1 | 82500 | 6806250000 | 13.74650 | 17.43459 | 17.36653 | 0.06806 |
| 1 | 85000 | 7225000000 | 14.31300 | 17.98065 | 17.90840 | 0.07225 |
| 1 | 87500 | 7656250000 | 14.94000 | 18.52809 | 18.45153 | 0.07656 |
| 1 | 90000 | 8100000000 | 15.36600 | 19.07690 | 18.99590 | 0.08100 |
| 1 | 92500 | 8556250000 | 16.10070 | 19.62709 | 19.54153 | 0.08556 |
| 1 | 95000 | 9025000000 | 16.92110 | 20.17865 | 20.08840 | 0.09025 |
| 1 | 97500 | 9506250000 | 16.90800 | 20.73159 | 20.63653 | 0.09506 |
| 1 | 100000 | 10000000000 | 18.52860 | 21.28590 | 21.18590 | 0.10000 |




f(n) =c0*x^0 + c1*x^1 + c2 *x^2

f(n) =c0*r^0 + c1*r^1 + c2 *r^2

| | |
|---|---|
| c0 = | 0.1859 |
| c1 = | 0.0002 |
| c2 = | 1.00E-10 |