Merge sort timing analysis

| P | data | f(n) fit |
|---|---|---|
| 1 | 15 | 15.0000 |
| 8 | 15 | 15.0000 |
| 50 | 15 | 15.0001 |
| 100 | 16 | 15.0001 |
| 2500 | 15 | 15.0056 |
| 5000 | 15 | 15.0123 |
| 10000 | 15 | 15.0266 |
| 20000 | 16 | 15.0572 |
| 40000 | 16 | 15.1223 |
| 50000 | 15 | 15.1561 |
| 75000 | 15 | 15.2429 |
| 100000 | 15 | 15.3322 |

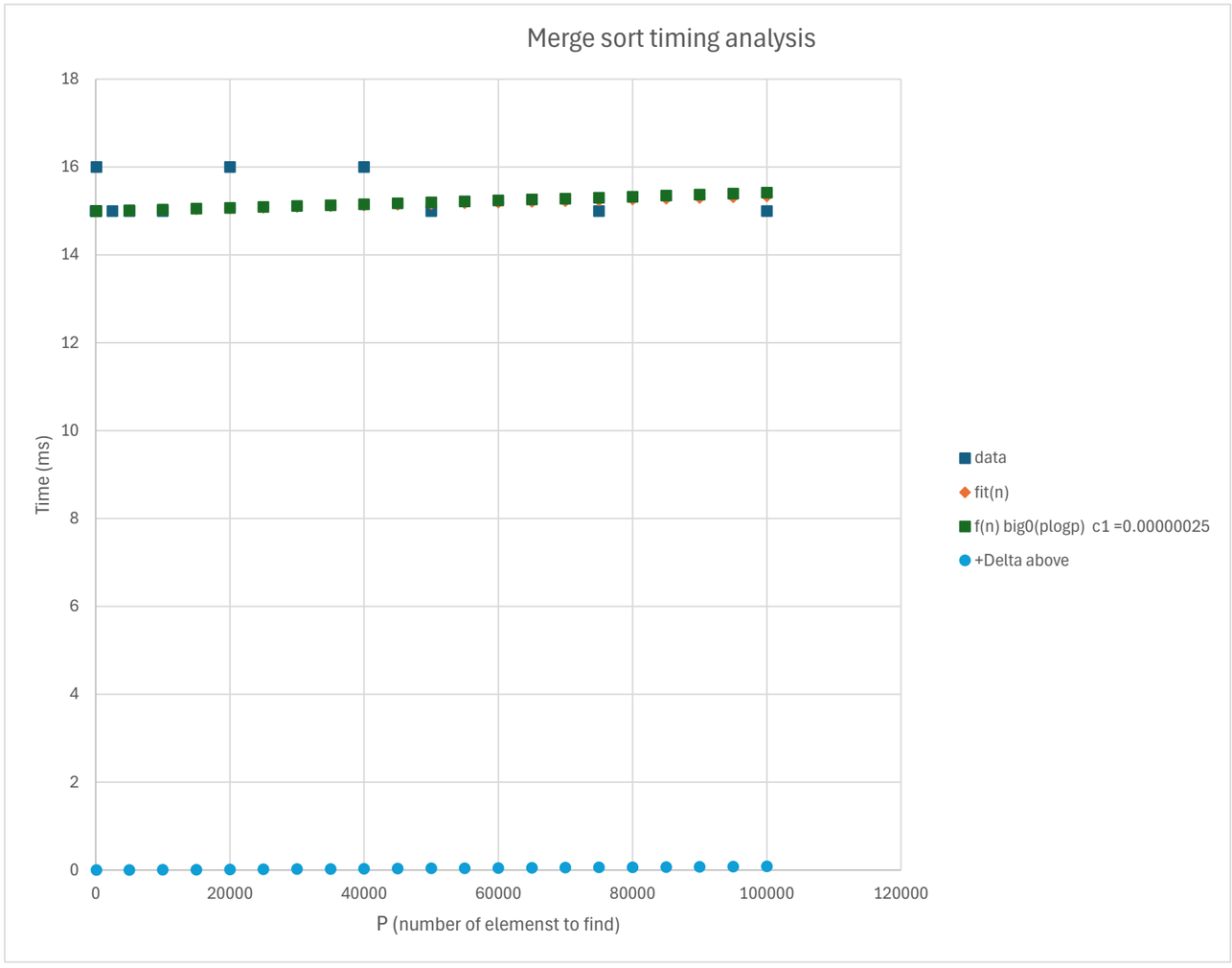
f(n) =c0 +c1 * n *log (n)

f(n) =c0 +c1 * p *log (p)

c0= 15

c1= 0.0000002

| p | N | Log p | p Log p | f(n) big0(plogp) c1 =0.00000025 | fit(n) | +Delta above |
|---|---|---|---|---|---|---|
| 100 | 100000 | 6.64385619 | 664.385619 | 15.0001661 | 15.00013288 | 3.32193E-05 |
| 5000 | 100000 | 12.28771238 | 61438.5619 | 15.01535964 | 15.01228771 | 0.003071928 |
| 10000 | 100000 | 13.28771238 | 132877.1238 | 15.03321928 | 15.02657542 | 0.006643856 |
| 15000 | 100000 | 13.87267488 | 208090.1232 | 15.05202253 | 15.04161802 | 0.010404506 |
| 20000 | 100000 | 14.28771238 | 285754.2476 | 15.07143856 | 15.05715085 | 0.014287712 |
| 25000 | 100000 | 14.60964047 | 365241.0119 | 15.09131025 | 15.0730482 | 0.018262051 |
| 30000 | 100000 | 14.87267488 | 446180.2464 | 15.11154506 | 15.08923605 | 0.022309012 |
| 35000 | 100000 | 15.0950673 | 528327.3556 | 15.13208184 | 15.10566547 | 0.026416368 |
| 40000 | 100000 | 15.28771238 | 611508.4952 | 15.15287712 | 15.1223017 | 0.030575425 |
| 45000 | 100000 | 15.45763738 | 695593.6821 | 15.17389842 | 15.13911874 | 0.034779684 |
| 50000 | 100000 | 15.60964047 | 780482.0237 | 15.19512051 | 15.1560964 | 0.039024101 |
| 55000 | 100000 | 15.747144 | 866092.9199 | 15.21652323 | 15.17321858 | 0.043304646 |
| 60000 | 100000 | 15.87267488 | 952360.4928 | 15.23809012 | 15.1904721 | 0.047618025 |
| 65000 | 100000 | 15.9881521 | 1039229.886 | 15.25980747 | 15.20784598 | 0.051961494 |
| 70000 | 100000 | 16.0950673 | 1126654.711 | 15.28166368 | 15.22533094 | 0.056332736 |
| 75000 | 100000 | 16.19460298 | 1214595.223 | 15.30364881 | 15.24291904 | 0.060729761 |
| 80000 | 100000 | 16.28771238 | 1303016.99 | 15.32575425 | 15.2606034 | 0.06515085 |
| 85000 | 100000 | 16.37517522 | 1391889.894 | 15.34797247 | 15.27837798 | 0.069594495 |
| 90000 | 100000 | 16.45763738 | 1481187.364 | 15.37029684 | 15.29623747 | 0.074059368 |
| 95000 | 100000 | 16.53563989 | 1570885.79 | 15.39272145 | 15.31417716 | 0.078544289 |
| 100000 | 100000 | 16.60964047 | 1660964.047 | 15.41524101 | 15.33219281 | 0.083048202 |



Merge sort Operational Analysis

| P | Data | f(n) fit |
|---|---|---|
| 1 | 1499984 | 10445423 |
| 8 | 3599935 | 10445475 |
| 50 | 5498937 | 10446033 |
| 100 | 6198587 | 10446858 |
| 2500 | 9384987 | 10506377 |
| 5000 | 10067487 | 10578130 |
| 10000 | 10732487 | 10732438 |
| 20000 | 11362487 | 11062652 |
| 40000 | 11922487 | 11766281 |
| 50000 | 12132487 | 12131264 |
| 75000 | 12307487 | 13068949 |
| 100000 | 12482487 | 14033105 |

f(n) =c0 +c1 * n *log (n)

f(n) =c0 +c1 * p *log (p)

| | |
|---|---|
| c0= | 10445423 |
| c1= | 2.16E+00 |

| p | N | Log p | p Log p | f(n) big0(plogp) c1 = 2.30 | fit(n) | +Delta above |
|---|---|---|---|---|---|---|
| 100 | 100000 | 6.64385619 | 664.385619 | 10446951 | 10446858 | 93 |
| 5000 | 100000 | 12.28771238 | 61438.5619 | 10586732 | 10578130 | 8601 |
| 10000 | 100000 | 13.28771238 | 132877.1238 | 10751040 | 10732438 | 18603 |
| 15000 | 100000 | 13.87267488 | 208090.1232 | 10924030 | 10894898 | 29133 |
| 20000 | 100000 | 14.28771238 | 285754.2476 | 11102658 | 11062652 | 40006 |
| 25000 | 100000 | 14.60964047 | 365241.0119 | 11285477 | 11234344 | 51134 |
| 30000 | 100000 | 14.87267488 | 446180.2464 | 11471638 | 11409172 | 62465 |
| 35000 | 100000 | 15.0950673 | 528327.3556 | 11660576 | 11586610 | 73966 |
| 40000 | 100000 | 15.28771238 | 611508.4952 | 11851893 | 11766281 | 85611 |
| 45000 | 100000 | 15.45763738 | 695593.6821 | 12045288 | 11947905 | 97383 |
| 50000 | 100000 | 15.60964047 | 780482.0237 | 12240532 | 12131264 | 109267 |
| 55000 | 100000 | 15.747144 | 866092.9199 | 12437437 | 12316184 | 121253 |
| 60000 | 100000 | 15.87267488 | 952360.4928 | 12635852 | 12502522 | 133330 |
| 65000 | 100000 | 15.9881521 | 1039229.886 | 12835652 | 12690160 | 145492 |
| 70000 | 100000 | 16.0950673 | 1126654.711 | 13036729 | 12878997 | 157732 |
| 75000 | 100000 | 16.19460298 | 1214595.223 | 13238992 | 13068949 | 170043 |
| 80000 | 100000 | 16.28771238 | 1303016.99 | 13442362 | 13259940 | 182422 |
| 85000 | 100000 | 16.37517522 | 1391889.894 | 13646770 | 13451905 | 194865 |
| 90000 | 100000 | 16.45763738 | 1481187.364 | 13852154 | 13644788 | 207366 |
| 95000 | 100000 | 16.53563989 | 1570885.79 | 14058460 | 13838536 | 219924 |
| 100000 | 100000 | 16.60964047 | 1660964.047 | 14265640 | 14033105 | 232535 |