Numbers *can* be anywhere from 1 to 1750. For the tables below, all numbers were set to 1750 (I am still randomly generating them, taking a mod, then adding the lower bound, see lines 50-52). Note: This was done on my local machine, not the Knuth server. The row in each table for 20 threads is there for testing whether or not the program would keep its efficiency from 2 threads to 20 threads with multiplying the work by 10 as well.

The program is NOT scalable.

Table 3.5: Times (seconds)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Thread Count | **Order of Matrix** | | | | | | | |
| 1000 | 2000 | 4000 | 8000 | 16,000 | 100,000 | 1 million | 10 million |
| 1 | 0.007075 | 0.010261 | 0.021040 | 0.040988 | 0.082247 | 0.498008 | 4.967125 | 49.995683 |
| 2 | 0.003635 | 0.006945 | 0.011156 | 0.023137 | 0.040813 | 0.299805 | 2.506910 | 25.434965 |
| 4 | 0.001489 | 0.003597 | 0.005140 | 0.011011 | 0.020248 | 0.130551 | 1.299751 | 12.656545 |
| 8 | 0.001037 | 0.001584 | 0.002846 | 0.006529 | 0.010668 | 0.084625 | 0.789724 | 6.997423 |
| 16 | 0.000974 | 0.001308 | 0.002180 | 0.003900 | 0.008251 | 0.044422 | 0.419356 | 4.043630 |
| 20 | N/A | N/A | N/A | N/A | N/A | 0.038985 | 0.375174 | 3.582457 |

Table 3.6: Speedup

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Thread Count | **Order of Matrix** | | | | | | | |
| 1000 | 2000 | 4000 | 8000 | 16,000 | 100,000 | 1 million | 10 million |
| 1 | 1.00000 | 1.00000 | 1.00000 | 1.00000 | 1.00000 | 1.00000 | 1.00000 | 1.00000 |
| 2 | 1.94635 | 1.47747 | 1.88598 | 1.77153 | 2.01522 | 1.66111 | 1.98137 | 1.96563 |
| 4 | 4.75151 | 2.85265 | 4.09339 | 3.72246 | 4.06198 | 3.81466 | 3.82160 | 3.95018 |
| 8 | 6.82257 | 6.47790 | 7.39283 | 6.27784 | 7.70969 | 5.88488 | 6.28970 | 7.14487 |
| 16 | 7.26386 | 7.84480 | 9.65138 | 10.50974 | 9.96813 | 11.21084 | 11.84465 | 12.36406 |
| 20 | N/A | N/A | N/A | N/A | N/A | 12.77435 | 13.23952 | 13.95570 |

Table 3.7: Efficiency

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Thread Count | **Order of Matrix** | | | | | | | |
| 1000 | 2000 | 4000 | 8000 | 16,000 | 100,000 | 1 million | 10 million |
| 1 | 1.000000 | 1.000000 | 1.000000 | 1.000000 | 1.000000 | 1.000000 | 1.000000 | 1.000000 |
| 2 | 0.973177 | 0.738733 | 0.942990 | 0.885767 | 1.007608 | 0.830553 | 0.990687 | 0.982814 |
| 4 | 1.187878 | 0.713164 | 1.023346 | 0.930615 | 1.015495 | 0.953666 | 0.955399 | 0.987546 |
| 8 | 0.852821 | 0.809738 | 0.924104 | 0.784730 | 0.963712 | 0.735610 | 0.786212 | 0.893109 |
| 16 | 0.453991 | 0.490300 | 0.603211 | 0.656859 | 0.623008 | 0.700678 | 0.740291 | 0.772754 |
| 20 | N/A | N/A | N/A | N/A | N/A | 0.638717 | 0.661976 | 0.697785 |