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 37-38). Note: This was done on my local machine, not the Knuth server.

The program is scalable, but it is weakly scalable.

Table 3.5: Times (seconds)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Comm Size | **Order of Matrix** | | | | | | | |
| 1000 | 2000 | 4000 | 8000 | 16,000 | 100,000 | 500,000 | 5 million |
| 1 | 0.00652 | 0.01315 | 0.02608 | 0.05213 | 0.10434 | 0.65117 | 3.25253 | 32.5414 |
| 2 | 0.00335 | 0.00661 | 0.01327 | 0.02630 | 0.05239 | 0.32869 | 1.63500 | 16.3499 |
| 4 | 0.00177 | 0.00351 | 0.00682 | 0.01338 | 0.02678 | 0.16583 | 0.82551 | 8.2528 |
| 8 | 0.00109 | 0.00192 | 0.00393 | 0.00740 | 0.01479 | 0.09068 | 0.43416 | 4.2210 |
| 10 | 0.00100 | 0.00167 | 0.00319 | 0.00625 | 0.01168 | 0.07359 | 0.35800 | 3.4934 |

Table 3.6: Speedup

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Comm Size | **Order of Matrix** | | | | | | | |
| 1000 | 2000 | 4000 | 8000 | 16,000 | 100,000 | 500,000 | 5 million |
| 1 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 2 | 1.946 | 1.989 | 1.965 | 1.982 | 1.992 | 1.981 | 1.989 | 1.990 |
| 4 | 3.684 | 3.746 | 3.824 | 3.896 | 3.896 | 3.927 | 3.940 | 3.943 |
| 8 | 5.982 | 6.849 | 6.636 | 7.045 | 7.055 | 7.181 | 7.492 | 7.709 |
| 10 | 6.520 | 7.874 | 8.176 | 8.341 | 8.933 | 8.849 | 9.085 | 9.315 |

Table 3.7: Efficiency

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Comm Size | **Order of Matrix** | | | | | | | |
| 1000 | 2000 | 4000 | 8000 | 16,000 | 100,000 | 500,000 | 5 million |
| 1 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 2 | 0.973 | 0.995 | 0.983 | 0.991 | 0.996 | 0.991 | 0.995 | 0.995 |
| 4 | 0.921 | 0.937 | 0.956 | 0.974 | 0.974 | 0.982 | 0.985 | 0.986 |
| 8 | 0.748 | 0.856 | 0.830 | 0.881 | 0.882 | 0.898 | 0.936 | 0.964 |
| 10 | 0.652 | 0.787 | 0.818 | 0.834 | 0.893 | 0.885 | 0.909 | 0.932 |