

Desc																	
Total elements computed:		m*n															
Serial Time:		Time taken in seconds for the matrix multiplication in serial															
Parallel Time:		Time taken in seconds for parallel program including all setup, distribution, core algorithm, and gather.															
Block Dist. Time		Time taken in seconds to distribute blocks of input matrices to corresponding processes in the process grid															
Core algorithm time:		Time taken in seconds for the core computation of the SUMMA algorithm. This includes the internal broadcasts (and the reduce for stat_A) but doesn't include the final gather operation.															
Bcast in Core comp:		Collective spent in seconds by the core computation for just broadcasts and reductions. Basically message passing instead of matrix multiplications.															
Final Gather operation		Time taken in seconds to gather the local_C values of each process to global C.															
Avg. Error		Average deviation from actual values due to precision errors for float values															
Sr. no.	Test Group	m	k	n	Grid size	Total Elements computed	Serial Time	Parallel Time	Block Dist. Time	Core algorithm time	Bcast in Core comp	Final Gather Operation	Avg. Error	Speedup	Comp : Comm ratio	Total time spent on communication	% comm. overhead
Stationary C																	
1	Square Matrices on 2x2 Grid	4096	4096	4096	2x2	16777216	2030.8336	130.2575	0.0531	130.1893	0.0225	0.0205	0	15.59091492	1354.493236	0.0961	0.0737
2		8192	8192	8192	2x2	67108864	7985.051	3992.6146	0.1782	3992.3699	0.0732	0.0665	0	1.999955368	12558.3413	0.3179	0.0079
3	Square Matrices on 4x4 Grid	4096	4096	4096	4x4	16777216	2030.8336	30.9712	0.0959	30.8473	0.0296	0.028	0	65.5716795	200.7667752	0.1535	0.4956
4		8192	8192	8192	4x4	67108864	7985.051	229.2599	0.0804	229.1499	0.0888	0.0296	0	34.82968893	1152.218813	0.1988	0.0867
5		16384	16384	16384	4x4	268435456	34826.3048	8044.6328	0.7613	8043.5827	0.4499	0.2888	0	4.329135421	5362.088533	1.5	0.0186
6	Square Matrices on 8x8 Grid	4096	4096	4096	8x8	16777216	2030.8336	4.043	0.2474	3.7695	0.0434	0.0261	0	502.3085827	11.75796781	0.3169	7.8382
7		8192	8192	8192	8x8	67108864	7985.051	63.7642	0.3873	63.3013	0.1594	0.0756	0	125.2278081	101.4653704	0.6223	0.9759
8		16384	16384	16384	8x8	268435456	34826.3048	682.3318	0.8925	681.1523	0.6877	0.2869	0	51.0401315	364.4500027	1.8671	0.2736
9	Rectangular Matrices on 2x2 Grid	4096	128	4096	2x2	16777216	55.108	1.1294	0.0015	1.1209	0.0006	0.0071	0	48.79404994	121.7717391	0.0092	0.8145
10		8192	128	8192	2x2	67108864	475.0471	4.439	0.0021	4.4103	0.0011	0.0266	0	107.0166929	147.9597315	0.0298	0.6713
11		16384	128	16384	2x2	268435456	967.8361	17.9116	0.0037	17.8042	0.0019	0.1037	0	54.03403939	162.8755718	0.1093	0.6102
12	Rectangular Matrices on 4x4 Grid	4096	128	4096	4x4	16777216	55.108	0.4238	0.0033	0.3984	0.0123	0.0222	0	130.0330345	10.21428571	0.0378	8.9193
13		8192	128	8192	4x4	67108864	475.0471	2.6937	0.023	2.5936	0.0114	0.0772	0	176.3548651	23.13799283	0.1116	4.143
14		16384	128	16384	4x4	268435456	967.8361	6.6909	0.0307	6.3597	0.0117	0.3006	0	144.6496137	18.50728863	0.343	5.1263
15		32768	128	32768	4x4	1073741824	1428.1624	531.1568	0.0447	529.8999	0.0118	1.2121	0	2.688777401	417.6951758	1.2686	0.2388
16	Rectangular Matrices on 8x8 Grid	4096	128	4096	8x8	16777216	55.108	0.1477	0.0069	0.1199	0.0205	0.0209	0	373.1076506	2.057971014	0.0483	32.7014
17		8192	128	8192	8x8	67108864	475.0471	0.3625	0.0063	0.2841	0.025	0.0721	0	1310.474759	2.505802708	0.1034	28.5241
18		16384	128	16384	8x8	268435456	967.8361	1.1674	0.0122	0.8893	0.0193	0.2659	0	829.0526812	2.92535306	0.2974	25.4754
19		32768	128	32768	8x8	1073741824	1428.1624	4.3167	0.1774	3.0857	0.0218	1.0536	0	330.8458776	2.445641762	1.2528	29.0221
Stationary A																	
1	Square Matrices on 2x2 Grid	4096	4096	4096	2x2	16777216	2030.8336	132.4534	0.0591	132.3754	0.0438	0.0189	7.14E-04	15.33243843	1086.466338	0.1218	0.0919
2		8192	8192	8192	2x2	67108864	7985.051	3917.121	0.1824	3916.871	0.32643	0.0677	4.82E-04	2.03849996	118.1179131	32.8844	0.8395
3	Square Matrices on 4x4 Grid	4096	4096	4096	4x4	16777216	2030.8336	20.8952	0.028	20.8581	0.1434	0.0092	7.01E-04	97.19139324	114.6993355	0.1806	0.8643
4		8192	8192	8192	4x4	67108864	7985.051	325.3804	0.2206	325.0831	0.1187	0.0767	7.01E-04	24.54066379	781.1644231	0.416	0.1278
5		16384	16384	16384	4x4	268435456	34826.3048	5817.9748	0.2787	5817.5846	658.4543	0.1115	2.50E-03	5.985984126	7.830573527	658.8445	11.3242
6	Square Matrices on 8x8 Grid	4096	4096	4096	8x8	16777216	2030.8336	3.8636	0.239	3.5978	0.093	0.0268	0.000061	525.6324671	9.768115942	0.3588	9.2866
7		8192	8192	8192	8x8	67108864	7985.051	63.6072	0.3817	63.1459	0.3522	0.0796	0.001221	125.5369046	77.18955132	0.8135	1.2789
8		16384	16384	16384	8x8	268435456	34826.3048	682.0915	0.8998	680.9273	34.348	0.2645	0.000488	51.05811288	18.207193	35.5123	5.2063
9	Rectangular Matrices on 2x2 Grid	4096	128	4096	2x2	16777216	55.108	1.1414	0.0014	1.1314	0.0192	0.0086	4.11E-06	48.28105835	38.0890411	0.0292	2.5582
10		8192	128	8192	2x2	67108864	475.0471	4.522	0.0028	4.4896	0.1572	0.0296	2.91E-06	105.0524326	22.85021097	0.1896	4.1928
11		16384	128	16384	2x2	268435456	967.8361	17.9734	0.004	17.8638	0.4691	0.1056	1.72E-06	53.84824797	30.05823397	0.5787	3.2197
12	Rectangular Matrices on 4x4 Grid	4096	128	4096	4x4	16777216	55.108	0.4592	0.0027	0.4349	0.0392	0.0216	4.11E-06	120.0087108	6.231496063	0.0635	13.8283
13		8192	128	8192	4x4	67108864	475.0471	0.7847	0.0049	0.7479	0.0372	0.0318	2.91E-06	605.3686995	9.617050068	0.0739	9.4176
14		16384	128	16384	4x4	268435456	967.8361	3.0276	0.0062	2.9085	0.3406	0.113	1.13E-05	319.6710596	5.584819487	0.4598	15.1969
15		32768	128	32768	4x4	1073741824	1428.1624	18.9573	0.1743	17.7135	1.3278	1.0696	3.47E-07	75.33574929	6.371544115	2.5717	13.5657
16	Rectangular Matrices on 8x8 Grid	4096	128	4096	8x8	16777216	55.108	0.1796	0.0055	0.1497	0.0583	0.0243	0.000011	306.8374165	1.037457435	0.0881	49.0534
17		8192	128	8192	8x8	67108864	475.0471	0.524	0.0064	0.4263	0.0935	0.0914	0.000011	906.5784351	1.739675902	0.1913	36.5076
18		16384	128	16384	8x8	268435456	967.8361	1.808	0.0104	1.5125	0.4263	0.2851	0.000015	535.3075774	1.504848989	0.7218	39.9225
19		32768	128	32768	8x8	1073741824	1428.1624	6.6521	0.1738	5.4237	1.307	1.0546	0.000015	214.6934652	1.62368857	2.5354	38.1142