Density check:

**Low density 0.1**

**X32**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 0,022 ms/op

# Warmup Iteration 2: 0,021 ms/op

# Warmup Iteration 3: 0,021 ms/op

# Warmup Iteration 4: 0,027 ms/op

# Warmup Iteration 5: 0,027 ms/op

Iteration 1: 0,028 ms/op

Iteration 2: 0,028 ms/op

Iteration 3: 0,028 ms/op

Iteration 4: 0,027 ms/op

Iteration 5: 0,027 ms/op

# Run progress: 50,00% complete, ETA 00:00:11

# Fork: 2 of 2

# Warmup Iteration 1: 0,021 ms/op

# Warmup Iteration 2: 0,020 ms/op

# Warmup Iteration 3: 0,020 ms/op

# Warmup Iteration 4: 0,021 ms/op

# Warmup Iteration 5: 0,021 ms/op

Iteration 1: 0,021 ms/op

Iteration 2: 0,021 ms/op

Iteration 3: 0,021 ms/op

Iteration 4: 0,021 ms/op

Iteration 5: 0,021 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

0,024 �(99.9%) 0,005 ms/op [Average]

(min, avg, max) = (0,021, 0,024, 0,028), stdev = 0,004

CI (99.9%): [0,019, 0,029] (assumes normal distribution)

# Run complete. Total time: 00:00:21

**X64**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 0,227 ms/op

# Warmup Iteration 2: 0,224 ms/op

# Warmup Iteration 3: 0,224 ms/op

# Warmup Iteration 4: 0,223 ms/op

# Warmup Iteration 5: 0,223 ms/op

Iteration 1: 0,221 ms/op

Iteration 2: 0,222 ms/op

Iteration 3: 0,221 ms/op

Iteration 4: 0,222 ms/op

Iteration 5: 0,220 ms/op

# Run progress: 50,00% complete, ETA 00:00:11

# Fork: 2 of 2

# Warmup Iteration 1: 0,222 ms/op

# Warmup Iteration 2: 0,219 ms/op

# Warmup Iteration 3: 0,219 ms/op

# Warmup Iteration 4: 0,218 ms/op

# Warmup Iteration 5: 0,218 ms/op

Iteration 1: 0,218 ms/op

Iteration 2: 0,215 ms/op

Iteration 3: 0,218 ms/op

Iteration 4: 0,217 ms/op

Iteration 5: 0,219 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

0,219 �(99.9%) 0,003 ms/op [Average]

(min, avg, max) = (0,215, 0,219, 0,222), stdev = 0,002

CI (99.9%): [0,216, 0,223] (assumes normal distribution)

# Run complete. Total time: 00:00:21

**X128**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 1,735 ms/op

# Warmup Iteration 2: 1,631 ms/op

# Warmup Iteration 3: 1,637 ms/op

# Warmup Iteration 4: 1,623 ms/op

# Warmup Iteration 5: 1,638 ms/op

Iteration 1: 1,634 ms/op

Iteration 2: 1,620 ms/op

Iteration 3: 1,620 ms/op

Iteration 4: 1,658 ms/op

Iteration 5: 1,634 ms/op

# Run progress: 50,00% complete, ETA 00:00:11

# Fork: 2 of 2

# Warmup Iteration 1: 1,745 ms/op

# Warmup Iteration 2: 1,739 ms/op

# Warmup Iteration 3: 1,707 ms/op

# Warmup Iteration 4: 1,723 ms/op

# Warmup Iteration 5: 1,689 ms/op

Iteration 1: 1,710 ms/op

Iteration 2: 1,687 ms/op

Iteration 3: 1,694 ms/op

Iteration 4: 1,703 ms/op

Iteration 5: 1,693 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

1,665 �(99.9%) 0,054 ms/op [Average]

(min, avg, max) = (1,620, 1,665, 1,710), stdev = 0,036

CI (99.9%): [1,611, 1,719] (assumes normal distribution)

# Run complete. Total time: 00:00:21

**X256**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 20,042 ms/op

# Warmup Iteration 2: 15,559 ms/op

# Warmup Iteration 3: 16,363 ms/op

# Warmup Iteration 4: 15,239 ms/op

# Warmup Iteration 5: 16,090 ms/op

Iteration 1: 14,846 ms/op

Iteration 2: 15,655 ms/op

Iteration 3: 15,129 ms/op

Iteration 4: 14,637 ms/op

Iteration 5: 14,523 ms/op

# Run progress: 50,00% complete, ETA 00:00:11

# Fork: 2 of 2

# Warmup Iteration 1: 15,344 ms/op

# Warmup Iteration 2: 14,790 ms/op

# Warmup Iteration 3: 14,712 ms/op

# Warmup Iteration 4: 14,831 ms/op

# Warmup Iteration 5: 14,541 ms/op

Iteration 1: 14,427 ms/op

Iteration 2: 14,322 ms/op

Iteration 3: 14,503 ms/op

Iteration 4: 14,645 ms/op

Iteration 5: 14,325 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

14,701 �(99.9%) 0,628 ms/op [Average]

(min, avg, max) = (14,322, 14,701, 15,655), stdev = 0,415

CI (99.9%): [14,074, 15,329] (assumes normal distribution)

# Run complete. Total time: 00:00:22

**X512**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 173,699 ms/op

# Warmup Iteration 2: 122,521 ms/op

# Warmup Iteration 3: 122,757 ms/op

# Warmup Iteration 4: 128,744 ms/op

# Warmup Iteration 5: 121,211 ms/op

Iteration 1: 119,948 ms/op

Iteration 2: 119,302 ms/op

Iteration 3: 121,393 ms/op

Iteration 4: 119,718 ms/op

Iteration 5: 121,576 ms/op

# Run progress: 50,00% complete, ETA 00:00:11

# Fork: 2 of 2

# Warmup Iteration 1: 159,423 ms/op

# Warmup Iteration 2: 117,920 ms/op

# Warmup Iteration 3: 119,308 ms/op

# Warmup Iteration 4: 119,201 ms/op

# Warmup Iteration 5: 120,060 ms/op

Iteration 1: 118,768 ms/op

Iteration 2: 119,649 ms/op

Iteration 3: 119,884 ms/op

Iteration 4: 117,216 ms/op

Iteration 5: 120,589 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

119,804 �(99.9%) 1,910 ms/op [Average]

(min, avg, max) = (117,216, 119,804, 121,576), stdev = 1,263

CI (99.9%): [117,895, 121,714] (assumes normal distribution)

# Run complete. Total time: 00:00:23

**X1024**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 2395,958 ms/op

# Warmup Iteration 2: 2339,427 ms/op

# Warmup Iteration 3: 1238,832 ms/op

# Warmup Iteration 4: 1217,356 ms/op

# Warmup Iteration 5: 1197,014 ms/op

Iteration 1: 1170,706 ms/op

Iteration 2: 1196,468 ms/op

Iteration 3: 1185,640 ms/op

Iteration 4: 1200,817 ms/op

Iteration 5: 1186,533 ms/op

# Run progress: 50,00% complete, ETA 00:00:15

# Fork: 2 of 2

# Warmup Iteration 1: 2296,279 ms/op

# Warmup Iteration 2: 2299,495 ms/op

# Warmup Iteration 3: 1209,498 ms/op

# Warmup Iteration 4: 1220,924 ms/op

# Warmup Iteration 5: 1234,736 ms/op

Iteration 1: 1189,194 ms/op

Iteration 2: 1204,268 ms/op

Iteration 3: 1191,085 ms/op

Iteration 4: 1193,882 ms/op

Iteration 5: 1208,717 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

1192,731 �(99.9%) 16,395 ms/op [Average]

(min, avg, max) = (1170,706, 1192,731, 1208,717), stdev = 10,844

CI (99.9%): [1176,336, 1209,125] (assumes normal distribution)

# Run complete. Total time: 00:00:30

**X2048**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 20722,359 ms/op

# Warmup Iteration 2: 20676,368 ms/op

# Warmup Iteration 3: 20727,858 ms/op

# Warmup Iteration 4: 20714,928 ms/op

# Warmup Iteration 5: 20762,998 ms/op

Iteration 1: 20738,689 ms/op

Iteration 2: 20781,706 ms/op

Iteration 3: 20736,493 ms/op

Iteration 4: 10930,408 ms/op

Iteration 5: 10859,132 ms/op

# Run progress: 50,00% complete, ETA 00:03:08

# Fork: 2 of 2

# Warmup Iteration 1: 20225,616 ms/op

# Warmup Iteration 2: 20148,278 ms/op

# Warmup Iteration 3: 20170,143 ms/op

# Warmup Iteration 4: 20161,691 ms/op

# Warmup Iteration 5: 20182,167 ms/op

Iteration 1: 20153,664 ms/op

Iteration 2: 20116,073 ms/op

Iteration 3: 20119,549 ms/op

Iteration 4: 10813,624 ms/op

Iteration 5: 10810,960 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

16606,030 �(99.9%) 7495,200 ms/op [Average]

(min, avg, max) = (10810,960, 16606,030, 20781,706), stdev = 4957,610

CI (99.9%): [9110,830, 24101,229] (assumes normal distribution)

# Run complete. Total time: 00:06:12

**DENSITY 0,2**

**X32**

**# Run progress: 0,00% complete, ETA 00:00:20**

**# Fork: 1 of 2**

**# Warmup Iteration 1: 0,044 ms/op**

**# Warmup Iteration 2: 0,043 ms/op**

**# Warmup Iteration 3: 0,041 ms/op**

**# Warmup Iteration 4: 0,041 ms/op**

**# Warmup Iteration 5: 0,041 ms/op**

**Iteration 1: 0,039 ms/op**

**Iteration 2: 0,039 ms/op**

**Iteration 3: 0,039 ms/op**

**Iteration 4: 0,041 ms/op**

**Iteration 5: 0,039 ms/op**

**# Run progress: 50,00% complete, ETA 00:00:11**

**# Fork: 2 of 2**

**# Warmup Iteration 1: 0,035 ms/op**

**# Warmup Iteration 2: 0,035 ms/op**

**# Warmup Iteration 3: 0,035 ms/op**

**# Warmup Iteration 4: 0,036 ms/op**

**# Warmup Iteration 5: 0,033 ms/op**

**Iteration 1: 0,033 ms/op**

**Iteration 2: 0,033 ms/op**

**Iteration 3: 0,033 ms/op**

**Iteration 4: 0,033 ms/op**

**Iteration 5: 0,033 ms/op**

**Result "org.example.MatrixSparse.multiplication":**

**0,036 �(99.9%) 0,005 ms/op [Average]**

**(min, avg, max) = (0,033, 0,036, 0,041), stdev = 0,003**

**CI (99.9%): [0,031, 0,042] (assumes normal distribution)**

**# Run complete. Total time: 00:00:22**

**X64**

**# Run progress: 0,00% complete, ETA 00:00:20**

**# Fork: 1 of 2**

**# Warmup Iteration 1: 0,427 ms/op**

**# Warmup Iteration 2: 0,416 ms/op**

**# Warmup Iteration 3: 0,407 ms/op**

**# Warmup Iteration 4: 0,416 ms/op**

**# Warmup Iteration 5: 0,419 ms/op**

**Iteration 1: 0,417 ms/op**

**Iteration 2: 0,416 ms/op**

**Iteration 3: 0,421 ms/op**

**Iteration 4: 0,422 ms/op**

**Iteration 5: 0,420 ms/op**

**# Run progress: 50,00% complete, ETA 00:00:10**

**# Fork: 2 of 2**

**# Warmup Iteration 1: 0,460 ms/op**

**# Warmup Iteration 2: 0,450 ms/op**

**# Warmup Iteration 3: 0,436 ms/op**

**# Warmup Iteration 4: 0,425 ms/op**

**# Warmup Iteration 5: 0,419 ms/op**

**Iteration 1: 0,421 ms/op**

**Iteration 2: 0,422 ms/op**

**Iteration 3: 0,429 ms/op**

**Iteration 4: 0,428 ms/op**

**Iteration 5: 0,427 ms/op**

**Result "org.example.MatrixSparse.multiplication":**

**0,422 �(99.9%) 0,007 ms/op [Average]**

**(min, avg, max) = (0,416, 0,422, 0,429), stdev = 0,004**

**CI (99.9%): [0,416, 0,429] (assumes normal distribution)**

**# Run complete. Total time: 00:00:21**

**X128**

**# Run progress: 0,00% complete, ETA 00:00:20**

**# Fork: 1 of 2**

**# Warmup Iteration 1: 3,386 ms/op**

**# Warmup Iteration 2: 3,198 ms/op**

**# Warmup Iteration 3: 3,150 ms/op**

**# Warmup Iteration 4: 3,193 ms/op**

**# Warmup Iteration 5: 3,110 ms/op**

**Iteration 1: 3,101 ms/op**

**Iteration 2: 3,166 ms/op**

**Iteration 3: 3,131 ms/op**

**Iteration 4: 3,163 ms/op**

**Iteration 5: 3,195 ms/op**

**# Run progress: 50,00% complete, ETA 00:00:11**

**# Fork: 2 of 2**

**# Warmup Iteration 1: 3,287 ms/op**

**# Warmup Iteration 2: 3,207 ms/op**

**# Warmup Iteration 3: 3,208 ms/op**

**# Warmup Iteration 4: 3,192 ms/op**

**# Warmup Iteration 5: 3,181 ms/op**

**Iteration 1: 3,201 ms/op**

**Iteration 2: 3,164 ms/op**

**Iteration 3: 3,181 ms/op**

**Iteration 4: 3,213 ms/op**

**Iteration 5: 3,247 ms/op**

**Result "org.example.MatrixSparse.multiplication":**

**3,176 �(99.9%) 0,063 ms/op [Average]**

**(min, avg, max) = (3,101, 3,176, 3,247), stdev = 0,041**

**CI (99.9%): [3,113, 3,239] (assumes normal distribution)**

**# Run complete. Total time: 00:00:22**

**X256**

**# Run progress: 0,00% complete, ETA 00:00:20**

**# Fork: 1 of 2**

**# Warmup Iteration 1: 28,405 ms/op**

**# Warmup Iteration 2: 27,205 ms/op**

**# Warmup Iteration 3: 26,971 ms/op**

**# Warmup Iteration 4: 26,555 ms/op**

**# Warmup Iteration 5: 27,354 ms/op**

**Iteration 1: 26,868 ms/op**

**Iteration 2: 26,315 ms/op**

**Iteration 3: 26,081 ms/op**

**Iteration 4: 26,139 ms/op**

**Iteration 5: 25,881 ms/op**

**# Run progress: 50,00% complete, ETA 00:00:11**

**# Fork: 2 of 2**

**# Warmup Iteration 1: 30,981 ms/op**

**# Warmup Iteration 2: 27,836 ms/op**

**# Warmup Iteration 3: 28,150 ms/op**

**# Warmup Iteration 4: 28,176 ms/op**

**# Warmup Iteration 5: 27,635 ms/op**

**Iteration 1: 26,974 ms/op**

**Iteration 2: 27,139 ms/op**

**Iteration 3: 26,647 ms/op**

**Iteration 4: 26,688 ms/op**

**Iteration 5: 27,736 ms/op**

**Result "org.example.MatrixSparse.multiplication":**

**26,647 �(99.9%) 0,852 ms/op [Average]**

**(min, avg, max) = (25,881, 26,647, 27,736), stdev = 0,564**

**CI (99.9%): [25,794, 27,499] (assumes normal distribution)**

**# Run complete. Total time: 00:00:22**

**X512**

**# Run progress: 0,00% complete, ETA 00:00:20**

**# Fork: 1 of 2**

**# Warmup Iteration 1: 341,681 ms/op**

**# Warmup Iteration 2: 250,159 ms/op**

**# Warmup Iteration 3: 255,942 ms/op**

**# Warmup Iteration 4: 248,352 ms/op**

**# Warmup Iteration 5: 250,545 ms/op**

**Iteration 1: 250,764 ms/op**

**Iteration 2: 250,176 ms/op**

**Iteration 3: 246,942 ms/op**

**Iteration 4: 251,299 ms/op**

**Iteration 5: 259,583 ms/op**

**# Run progress: 50,00% complete, ETA 00:00:12**

**# Fork: 2 of 2**

**# Warmup Iteration 1: 340,848 ms/op**

**# Warmup Iteration 2: 259,205 ms/op**

**# Warmup Iteration 3: 260,566 ms/op**

**# Warmup Iteration 4: 250,469 ms/op**

**# Warmup Iteration 5: 248,238 ms/op**

**Iteration 1: 246,240 ms/op**

**Iteration 2: 247,015 ms/op**

**Iteration 3: 247,492 ms/op**

**Iteration 4: 254,266 ms/op**

**Iteration 5: 254,012 ms/op**

**Result "org.example.MatrixSparse.multiplication":**

**250,779 �(99.9%) 6,395 ms/op [Average]**

**(min, avg, max) = (246,240, 250,779, 259,583), stdev = 4,230**

**CI (99.9%): [244,384, 257,174] (assumes normal distribution)**

**# Run complete. Total time: 00:00:24**

**X1024**

**# Run progress: 0,00% complete, ETA 00:00:20**

**# Fork: 1 of 2**

**# Warmup Iteration 1: 3684,907 ms/op**

**# Warmup Iteration 2: 3682,985 ms/op**

**# Warmup Iteration 3: 3768,646 ms/op**

**# Warmup Iteration 4: 3676,548 ms/op**

**# Warmup Iteration 5: 3845,687 ms/op**

**Iteration 1: 3820,380 ms/op**

**Iteration 2: 3631,448 ms/op**

**Iteration 3: 3711,225 ms/op**

**Iteration 4: 2378,649 ms/op**

**Iteration 5: 2343,406 ms/op**

**# Run progress: 50,00% complete, ETA 00:00:35**

**# Fork: 2 of 2**

**# Warmup Iteration 1: 3756,242 ms/op**

**# Warmup Iteration 2: 3716,407 ms/op**

**# Warmup Iteration 3: 2504,279 ms/op**

**# Warmup Iteration 4: 2466,605 ms/op**

**# Warmup Iteration 5: 2478,051 ms/op**

**Iteration 1: 2538,961 ms/op**

**Iteration 2: 2556,187 ms/op**

**Iteration 3: 2544,571 ms/op**

**Iteration 4: 2454,877 ms/op**

**Iteration 5: 2550,588 ms/op**

**Result "org.example.MatrixSparse.multiplication":**

**2853,029 �(99.9%) 914,761 ms/op [Average]**

**(min, avg, max) = (2343,406, 2853,029, 3820,380), stdev = 605,058**

**CI (99.9%): [1938,268, 3767,790] (assumes normal distribution)**

**# Run complete. Total time: 00:01:04**

**X2048**

**# Run progress: 0,00% complete, ETA 00:00:20**

**# Fork: 1 of 2**

**# Warmup Iteration 1: 34688,657 ms/op**

**# Warmup Iteration 2: 34370,648 ms/op**

**# Warmup Iteration 3: 34142,413 ms/op**

**# Warmup Iteration 4: 34282,002 ms/op**

**# Warmup Iteration 5: 34959,582 ms/op**

**Iteration 1: 34573,015 ms/op**

**Iteration 2: 34442,683 ms/op**

**Iteration 3: 33791,365 ms/op**

**Iteration 4: 22474,444 ms/op**

**Iteration 5: 22408,123 ms/op**

**# Run progress: 50,00% complete, ETA 00:05:21**

**# Fork: 2 of 2**

**# Warmup Iteration 1: 33351,332 ms/op**

**# Warmup Iteration 2: 33396,933 ms/op**

**# Warmup Iteration 3: 24184,209 ms/op**

**# Warmup Iteration 4: 24040,090 ms/op**

**# Warmup Iteration 5: 24386,055 ms/op**

**Iteration 1: 24518,287 ms/op**

**Iteration 2: 23914,492 ms/op**

**Iteration 3: 23582,162 ms/op**

**Iteration 4: 23573,236 ms/op**

**Iteration 5: 23614,444 ms/op**

**Result "org.example.MatrixSparse.multiplication":**

**26689,225 �(99.9%) 7968,705 ms/op [Average]**

**(min, avg, max) = (22408,123, 26689,225, 34573,015), stdev = 5270,805**

**CI (99.9%): [18720,520, 34657,930] (assumes normal distribution)**

**# Run complete. Total time: 00:09:40**

**DENSITY 0,5**

**X32**

**# Run progress: 0,00% complete, ETA 00:00:20**

**# Fork: 1 of 2**

**# Warmup Iteration 1: 0,028 ms/op**

**# Warmup Iteration 2: 0,027 ms/op**

**# Warmup Iteration 3: 0,027 ms/op**

**# Warmup Iteration 4: 0,027 ms/op**

**# Warmup Iteration 5: 0,027 ms/op**

**Iteration 1: 0,026 ms/op**

**Iteration 2: 0,026 ms/op**

**Iteration 3: 0,026 ms/op**

**Iteration 4: 0,026 ms/op**

**Iteration 5: 0,026 ms/op**

**# Run progress: 50,00% complete, ETA 00:00:11**

**# Fork: 2 of 2**

**# Warmup Iteration 1: 0,026 ms/op**

**# Warmup Iteration 2: 0,025 ms/op**

**# Warmup Iteration 3: 0,025 ms/op**

**# Warmup Iteration 4: 0,026 ms/op**

**# Warmup Iteration 5: 0,027 ms/op**

**Iteration 1: 0,026 ms/op**

**Iteration 2: 0,026 ms/op**

**Iteration 3: 0,026 ms/op**

**Iteration 4: 0,026 ms/op**

**Iteration 5: 0,026 ms/op**

**Result "org.example.MatrixSparse.multiplication":**

**0,026 �(99.9%) 0,001 ms/op [Average]**

**(min, avg, max) = (0,026, 0,026, 0,026), stdev = 0,001**

**CI (99.9%): [0,025, 0,026] (assumes normal distribution)**

**# Run complete. Total time: 00:00:22**

**X64**

**# Run progress: 0,00% complete, ETA 00:00:20**

**# Fork: 1 of 2**

**# Warmup Iteration 1: 0,236 ms/op**

**# Warmup Iteration 2: 0,227 ms/op**

**# Warmup Iteration 3: 0,227 ms/op**

**# Warmup Iteration 4: 0,227 ms/op**

**# Warmup Iteration 5: 0,230 ms/op**

**Iteration 1: 0,244 ms/op**

**Iteration 2: 0,230 ms/op**

**Iteration 3: 0,229 ms/op**

**Iteration 4: 0,226 ms/op**

**Iteration 5: 0,228 ms/op**

**# Run progress: 50,00% complete, ETA 00:00:11**

**# Fork: 2 of 2**

**# Warmup Iteration 1: 0,237 ms/op**

**# Warmup Iteration 2: 0,232 ms/op**

**# Warmup Iteration 3: 0,225 ms/op**

**# Warmup Iteration 4: 0,226 ms/op**

**# Warmup Iteration 5: 0,228 ms/op**

**Iteration 1: 0,230 ms/op**

**Iteration 2: 0,229 ms/op**

**Iteration 3: 0,222 ms/op**

**Iteration 4: 0,222 ms/op**

**Iteration 5: 0,226 ms/op**

**Result "org.example.MatrixSparse.multiplication":**

**0,229 �(99.9%) 0,009 ms/op [Average]**

**(min, avg, max) = (0,222, 0,229, 0,244), stdev = 0,006**

**CI (99.9%): [0,219, 0,238] (assumes normal distribution)**

**# Run complete. Total time: 00:00:21**

**X128**

**# Run progress: 0,00% complete, ETA 00:00:20**

**# Fork: 1 of 2**

**# Warmup Iteration 1: 2,023 ms/op**

**# Warmup Iteration 2: 1,990 ms/op**

**# Warmup Iteration 3: 1,964 ms/op**

**# Warmup Iteration 4: 1,978 ms/op**

**# Warmup Iteration 5: 1,969 ms/op**

**Iteration 1: 1,964 ms/op**

**Iteration 2: 1,964 ms/op**

**Iteration 3: 1,966 ms/op**

**Iteration 4: 1,977 ms/op**

**Iteration 5: 1,970 ms/op**

**# Run progress: 50,00% complete, ETA 00:00:11**

**# Fork: 2 of 2**

**# Warmup Iteration 1: 2,042 ms/op**

**# Warmup Iteration 2: 2,045 ms/op**

**# Warmup Iteration 3: 1,989 ms/op**

**# Warmup Iteration 4: 1,971 ms/op**

**# Warmup Iteration 5: 2,039 ms/op**

**Iteration 1: 2,043 ms/op**

**Iteration 2: 2,059 ms/op**

**Iteration 3: 2,013 ms/op**

**Iteration 4: 2,038 ms/op**

**Iteration 5: 2,028 ms/op**

**Result "org.example.MatrixSparse.multiplication":**

**2,002 �(99.9%) 0,057 ms/op [Average]**

**(min, avg, max) = (1,964, 2,002, 2,059), stdev = 0,038**

**CI (99.9%): [1,945, 2,059] (assumes normal distribution)**

**# Run complete. Total time: 00:00:21**

**X256**

**# Run progress: 0,00% complete, ETA 00:00:20**

**# Fork: 1 of 2**

**# Warmup Iteration 1: 20,023 ms/op**

**# Warmup Iteration 2: 17,895 ms/op**

**# Warmup Iteration 3: 17,825 ms/op**

**# Warmup Iteration 4: 18,034 ms/op**

**# Warmup Iteration 5: 18,170 ms/op**

**Iteration 1: 18,050 ms/op**

**Iteration 2: 17,889 ms/op**

**Iteration 3: 17,752 ms/op**

**Iteration 4: 17,863 ms/op**

**Iteration 5: 18,135 ms/op**

**# Run progress: 50,00% complete, ETA 00:00:11**

**# Fork: 2 of 2**

**# Warmup Iteration 1: 18,147 ms/op**

**# Warmup Iteration 2: 17,824 ms/op**

**# Warmup Iteration 3: 18,002 ms/op**

**# Warmup Iteration 4: 18,012 ms/op**

**# Warmup Iteration 5: 17,865 ms/op**

**Iteration 1: 18,422 ms/op**

**Iteration 2: 18,253 ms/op**

**Iteration 3: 18,032 ms/op**

**Iteration 4: 18,185 ms/op**

**Iteration 5: 18,127 ms/op**

**Result "org.example.MatrixSparse.multiplication":**

**18,071 �(99.9%) 0,301 ms/op [Average]**

**(min, avg, max) = (17,752, 18,071, 18,422), stdev = 0,199**

**CI (99.9%): [17,770, 18,372] (assumes normal distribution)**

**# Run complete. Total time: 00:00:22**

**X512**

**# Run progress: 0,00% complete, ETA 00:00:20**

**# Fork: 1 of 2**

**# Warmup Iteration 1: 179,177 ms/op**

**# Warmup Iteration 2: 173,237 ms/op**

**# Warmup Iteration 3: 171,424 ms/op**

**# Warmup Iteration 4: 171,721 ms/op**

**# Warmup Iteration 5: 170,885 ms/op**

**Iteration 1: 171,755 ms/op**

**Iteration 2: 170,666 ms/op**

**Iteration 3: 174,455 ms/op**

**Iteration 4: 177,839 ms/op**

**Iteration 5: 173,800 ms/op**

**# Run progress: 50,00% complete, ETA 00:00:11**

**# Fork: 2 of 2**

**# Warmup Iteration 1: 176,277 ms/op**

**# Warmup Iteration 2: 171,088 ms/op**

**# Warmup Iteration 3: 169,122 ms/op**

**# Warmup Iteration 4: 173,291 ms/op**

**# Warmup Iteration 5: 170,488 ms/op**

**Iteration 1: 170,223 ms/op**

**Iteration 2: 170,643 ms/op**

**Iteration 3: 173,212 ms/op**

**Iteration 4: 173,614 ms/op**

**Iteration 5: 178,516 ms/op**

**Result "org.example.MatrixSparse.multiplication":**

**173,472 �(99.9%) 4,366 ms/op [Average]**

**(min, avg, max) = (170,223, 173,472, 178,516), stdev = 2,888**

**CI (99.9%): [169,106, 177,838] (assumes normal distribution)**

**# Run complete. Total time: 00:00:22**

**X1024**

**# Run progress: 0,00% complete, ETA 00:00:20**

**# Fork: 1 of 2**

**# Warmup Iteration 1: 6953,900 ms/op**

**# Warmup Iteration 2: 6768,695 ms/op**

**# Warmup Iteration 3: 6731,477 ms/op**

**# Warmup Iteration 4: 6897,906 ms/op**

**# Warmup Iteration 5: 6715,429 ms/op**

**Iteration 1: 6628,410 ms/op**

**Iteration 2: 6610,571 ms/op**

**Iteration 3: 6707,759 ms/op**

**Iteration 4: 6829,005 ms/op**

**Iteration 5: 6886,243 ms/op**

**# Run progress: 50,00% complete, ETA 00:01:08**

**# Fork: 2 of 2**

**# Warmup Iteration 1: 5963,421 ms/op**

**# Warmup Iteration 2: 5743,726 ms/op**

**# Warmup Iteration 3: 5788,520 ms/op**

**# Warmup Iteration 4: 5805,421 ms/op**

**# Warmup Iteration 5: 5675,048 ms/op**

**Iteration 1: 5658,035 ms/op**

**Iteration 2: 5645,235 ms/op**

**Iteration 3: 5649,271 ms/op**

**Iteration 4: 5661,130 ms/op**

**Iteration 5: 5672,870 ms/op**

**Result "org.example.MatrixSparse.multiplication":**

**6194,853 �(99.9%) 865,460 ms/op [Average]**

**(min, avg, max) = (5645,235, 6194,853, 6886,243), stdev = 572,448**

**CI (99.9%): [5329,393, 7060,313] (assumes normal distribution)**

**# Run complete. Total time: 00:02:06**

**X2048**

**# Run progress: 0,00% complete, ETA 00:00:20**

**# Fork: 1 of 2**

**# Warmup Iteration 1: 105399,170 ms/op**

**# Warmup Iteration 2: 104006,347 ms/op**

**# Warmup Iteration 3: 104737,568 ms/op**

**# Warmup Iteration 4: 105061,187 ms/op**

**# Warmup Iteration 5: 105681,560 ms/op**

**Iteration 1: 106071,104 ms/op**

**Iteration 2: 105971,746 ms/op**

**Iteration 3: 105733,700 ms/op**

**Iteration 4: 107921,720 ms/op**

**Iteration 5: 107996,907 ms/op**

**# Run progress: 50,00% complete, ETA 00:17:39**

**# Fork: 2 of 2**

**# Warmup Iteration 1: 106991,490 ms/op**

**# Warmup Iteration 2: 105163,821 ms/op**

**# Warmup Iteration 3: 107281,531 ms/op**

**# Warmup Iteration 4: 107928,057 ms/op**

**# Warmup Iteration 5: 106870,536 ms/op**

**Iteration 1: 107775,387 ms/op**

**Iteration 2: 107637,972 ms/op**

**Iteration 3: 109924,836 ms/op**

**Iteration 4: 109283,951 ms/op**

**Iteration 5: 107058,900 ms/op**

**Result "org.example.MatrixSparse.multiplication":**

**107537,622 �(99.9%) 2093,647 ms/op [Average]**

**(min, avg, max) = (105733,700, 107537,622, 109924,836), stdev = 1384,818**

**CI (99.9%): [105443,975, 109631,270] (assumes normal distribution)**

**# Run complete. Total time: 00:35:36**

**DENSITY 0,7**

**X32**

**X64**

**X128**

**X256**

**X512**

**X1024**

**X2048**

**DENSITY 0,9**

**X32**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 0,028 ms/op

# Warmup Iteration 2: 0,027 ms/op

# Warmup Iteration 3: 0,026 ms/op

# Warmup Iteration 4: 0,027 ms/op

# Warmup Iteration 5: 0,027 ms/op

Iteration 1: 0,027 ms/op

Iteration 2: 0,027 ms/op

Iteration 3: 0,027 ms/op

Iteration 4: 0,026 ms/op

Iteration 5: 0,027 ms/op

# Run progress: 50,00% complete, ETA 00:00:11

# Fork: 2 of 2

# Warmup Iteration 1: 0,027 ms/op

# Warmup Iteration 2: 0,027 ms/op

# Warmup Iteration 3: 0,027 ms/op

# Warmup Iteration 4: 0,026 ms/op

# Warmup Iteration 5: 0,026 ms/op

Iteration 1: 0,026 ms/op

Iteration 2: 0,026 ms/op

Iteration 3: 0,026 ms/op

Iteration 4: 0,027 ms/op

Iteration 5: 0,026 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

0,027 �(99.9%) 0,001 ms/op [Average]

(min, avg, max) = (0,026, 0,027, 0,027), stdev = 0,001

CI (99.9%): [0,026, 0,027] (assumes normal distribution)

# Run complete. Total time: 00:00:21

**X64**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 0,258 ms/op

# Warmup Iteration 2: 0,247 ms/op

# Warmup Iteration 3: 0,245 ms/op

# Warmup Iteration 4: 0,244 ms/op

# Warmup Iteration 5: 0,246 ms/op

Iteration 1: 0,243 ms/op

Iteration 2: 0,244 ms/op

Iteration 3: 0,243 ms/op

Iteration 4: 0,244 ms/op

Iteration 5: 0,245 ms/op

# Run progress: 50,00% complete, ETA 00:00:10

# Fork: 2 of 2

# Warmup Iteration 1: 0,236 ms/op

# Warmup Iteration 2: 0,233 ms/op

# Warmup Iteration 3: 0,233 ms/op

# Warmup Iteration 4: 0,231 ms/op

# Warmup Iteration 5: 0,231 ms/op

Iteration 1: 0,232 ms/op

Iteration 2: 0,231 ms/op

Iteration 3: 0,232 ms/op

Iteration 4: 0,235 ms/op

Iteration 5: 0,233 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

0,238 �(99.9%) 0,009 ms/op [Average]

(min, avg, max) = (0,231, 0,238, 0,245), stdev = 0,006

CI (99.9%): [0,229, 0,247] (assumes normal distribution)

# Run complete. Total time: 00:00:21

**X128**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 2,094 ms/op

# Warmup Iteration 2: 2,085 ms/op

# Warmup Iteration 3: 2,063 ms/op

# Warmup Iteration 4: 2,036 ms/op

# Warmup Iteration 5: 2,025 ms/op

Iteration 1: 2,038 ms/op

Iteration 2: 2,033 ms/op

Iteration 3: 2,024 ms/op

Iteration 4: 2,033 ms/op

Iteration 5: 2,029 ms/op

# Run progress: 50,00% complete, ETA 00:00:11

# Fork: 2 of 2

# Warmup Iteration 1: 2,119 ms/op

# Warmup Iteration 2: 2,050 ms/op

# Warmup Iteration 3: 2,036 ms/op

# Warmup Iteration 4: 2,031 ms/op

# Warmup Iteration 5: 2,027 ms/op

Iteration 1: 2,040 ms/op

Iteration 2: 2,036 ms/op

Iteration 3: 2,036 ms/op

Iteration 4: 2,014 ms/op

Iteration 5: 2,023 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

2,030 �(99.9%) 0,012 ms/op [Average]

(min, avg, max) = (2,014, 2,030, 2,040), stdev = 0,008

CI (99.9%): [2,018, 2,043] (assumes normal distribution)

# Run complete. Total time: 00:00:22

**X256**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 19,141 ms/op

# Warmup Iteration 2: 18,606 ms/op

# Warmup Iteration 3: 18,187 ms/op

# Warmup Iteration 4: 18,268 ms/op

# Warmup Iteration 5: 18,387 ms/op

Iteration 1: 18,742 ms/op

Iteration 2: 18,821 ms/op

Iteration 3: 18,353 ms/op

Iteration 4: 18,779 ms/op

Iteration 5: 18,307 ms/op

# Run progress: 50,00% complete, ETA 00:00:11

# Fork: 2 of 2

# Warmup Iteration 1: 18,849 ms/op

# Warmup Iteration 2: 18,399 ms/op

# Warmup Iteration 3: 18,352 ms/op

# Warmup Iteration 4: 18,552 ms/op

# Warmup Iteration 5: 18,487 ms/op

Iteration 1: 18,356 ms/op

Iteration 2: 18,326 ms/op

Iteration 3: 18,398 ms/op

Iteration 4: 18,328 ms/op

Iteration 5: 18,254 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

18,466 �(99.9%) 0,334 ms/op [Average]

(min, avg, max) = (18,254, 18,466, 18,821), stdev = 0,221

CI (99.9%): [18,132, 18,800] (assumes normal distribution)

# Run complete. Total time: 00:00:22

**X512**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 288,828 ms/op

# Warmup Iteration 2: 260,109 ms/op

# Warmup Iteration 3: 263,021 ms/op

# Warmup Iteration 4: 260,629 ms/op

# Warmup Iteration 5: 253,857 ms/op

Iteration 1: 261,704 ms/op

Iteration 2: 254,332 ms/op

Iteration 3: 258,922 ms/op

Iteration 4: 257,431 ms/op

Iteration 5: 262,809 ms/op

# Run progress: 50,00% complete, ETA 00:00:11

# Fork: 2 of 2

# Warmup Iteration 1: 197,314 ms/op

# Warmup Iteration 2: 190,633 ms/op

# Warmup Iteration 3: 186,028 ms/op

# Warmup Iteration 4: 191,262 ms/op

# Warmup Iteration 5: 186,356 ms/op

Iteration 1: 188,985 ms/op

Iteration 2: 187,725 ms/op

Iteration 3: 183,497 ms/op

Iteration 4: 185,399 ms/op

Iteration 5: 187,327 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

222,813 �(99.9%) 57,874 ms/op [Average]

(min, avg, max) = (183,497, 222,813, 262,809), stdev = 38,280

CI (99.9%): [164,939, 280,687] (assumes normal distribution)

# Run complete. Total time: 00:00:23

**X1024**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 6769,686 ms/op

# Warmup Iteration 2: 6707,805 ms/op

# Warmup Iteration 3: 6751,142 ms/op

# Warmup Iteration 4: 6845,014 ms/op

# Warmup Iteration 5: 6716,966 ms/op

Iteration 1: 6694,270 ms/op

Iteration 2: 6691,054 ms/op

Iteration 3: 6680,263 ms/op

Iteration 4: 6695,265 ms/op

Iteration 5: 6723,692 ms/op

# Run progress: 50,00% complete, ETA 00:01:08

# Fork: 2 of 2

# Warmup Iteration 1: 6706,997 ms/op

# Warmup Iteration 2: 6651,743 ms/op

# Warmup Iteration 3: 6656,870 ms/op

# Warmup Iteration 4: 6633,905 ms/op

# Warmup Iteration 5: 6626,586 ms/op

Iteration 1: 6639,162 ms/op

Iteration 2: 6667,168 ms/op

Iteration 3: 6633,093 ms/op

Iteration 4: 6671,654 ms/op

Iteration 5: 6612,258 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

6670,788 �(99.9%) 51,172 ms/op [Average]

(min, avg, max) = (6612,258, 6670,788, 6723,692), stdev = 33,847

CI (99.9%): [6619,616, 6721,960] (assumes normal distribution)

# Run complete. Total time: 00:02:15

**X2048**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 101717,632 ms/op

# Warmup Iteration 2: 101601,457 ms/op

# Warmup Iteration 3: 101687,747 ms/op

# Warmup Iteration 4: 101745,477 ms/op

# Warmup Iteration 5: 101712,237 ms/op

Iteration 1: 101665,684 ms/op

Iteration 2: 101844,481 ms/op

Iteration 3: 101767,348 ms/op

Iteration 4: 103931,784 ms/op

Iteration 5: 104023,627 ms/op

# Run progress: 50,00% complete, ETA 00:17:02

# Fork: 2 of 2

# Warmup Iteration 1: 108762,587 ms/op

# Warmup Iteration 2: 108845,684 ms/op

# Warmup Iteration 3: 108763,400 ms/op

# Warmup Iteration 4: 109002,274 ms/op

# Warmup Iteration 5: 108772,663 ms/op

Iteration 1: 108815,891 ms/op

Iteration 2: 108871,211 ms/op

Iteration 3: 108767,569 ms/op

Iteration 4: 110878,468 ms/op

Iteration 5: 110891,407 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

106145,747 �(99.9%) 5822,755 ms/op [Average]

(min, avg, max) = (101665,684, 106145,747, 110891,407), stdev = 3851,392

CI (99.9%): [100322,992, 111968,502] (assumes normal distribution)

# Run complete. Total time: 00:35:16

**BLOCK MULTI**

**DENSITY 0,1**

**X32**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 0,035 ms/op

# Warmup Iteration 2: 0,029 ms/op

# Warmup Iteration 3: 0,030 ms/op

# Warmup Iteration 4: 0,028 ms/op

# Warmup Iteration 5: 0,029 ms/op

Iteration 1: 0,028 ms/op

Iteration 2: 0,028 ms/op

Iteration 3: 0,028 ms/op

Iteration 4: 0,030 ms/op

Iteration 5: 0,029 ms/op

# Run progress: 50,00% complete, ETA 00:00:11

# Fork: 2 of 2

# Warmup Iteration 1: 0,028 ms/op

# Warmup Iteration 2: 0,028 ms/op

# Warmup Iteration 3: 0,029 ms/op

# Warmup Iteration 4: 0,028 ms/op

# Warmup Iteration 5: 0,029 ms/op

Iteration 1: 0,028 ms/op

Iteration 2: 0,028 ms/op

Iteration 3: 0,028 ms/op

Iteration 4: 0,028 ms/op

Iteration 5: 0,028 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

0,028 �(99.9%) 0,001 ms/op [Average]

(min, avg, max) = (0,028, 0,028, 0,030), stdev = 0,001

CI (99.9%): [0,027, 0,029] (assumes normal distribution)

# Run complete. Total time: 00:00:22

**X64**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 0,255 ms/op

# Warmup Iteration 2: 0,240 ms/op

# Warmup Iteration 3: 0,241 ms/op

# Warmup Iteration 4: 0,241 ms/op

# Warmup Iteration 5: 0,237 ms/op

Iteration 1: 0,236 ms/op

Iteration 2: 0,236 ms/op

Iteration 3: 0,237 ms/op

Iteration 4: 0,240 ms/op

Iteration 5: 0,238 ms/op

# Run progress: 50,00% complete, ETA 00:00:11

# Fork: 2 of 2

# Warmup Iteration 1: 0,250 ms/op

# Warmup Iteration 2: 0,239 ms/op

# Warmup Iteration 3: 0,236 ms/op

# Warmup Iteration 4: 0,236 ms/op

# Warmup Iteration 5: 0,238 ms/op

Iteration 1: 0,235 ms/op

Iteration 2: 0,237 ms/op

Iteration 3: 0,239 ms/op

Iteration 4: 0,245 ms/op

Iteration 5: 0,237 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

0,238 �(99.9%) 0,004 ms/op [Average]

(min, avg, max) = (0,235, 0,238, 0,245), stdev = 0,003

CI (99.9%): [0,234, 0,242] (assumes normal distribution)

# Run complete. Total time: 00:00:21

**X128**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 2,083 ms/op

# Warmup Iteration 2: 1,985 ms/op

# Warmup Iteration 3: 1,986 ms/op

# Warmup Iteration 4: 1,943 ms/op

# Warmup Iteration 5: 1,978 ms/op

Iteration 1: 1,960 ms/op

Iteration 2: 1,943 ms/op

Iteration 3: 1,985 ms/op

Iteration 4: 1,974 ms/op

Iteration 5: 1,970 ms/op

# Run progress: 50,00% complete, ETA 00:00:11

# Fork: 2 of 2

# Warmup Iteration 1: 2,004 ms/op

# Warmup Iteration 2: 1,965 ms/op

# Warmup Iteration 3: 1,967 ms/op

# Warmup Iteration 4: 1,959 ms/op

# Warmup Iteration 5: 1,966 ms/op

Iteration 1: 2,059 ms/op

Iteration 2: 1,972 ms/op

Iteration 3: 1,984 ms/op

Iteration 4: 1,981 ms/op

Iteration 5: 1,953 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

1,978 �(99.9%) 0,048 ms/op [Average]

(min, avg, max) = (1,943, 1,978, 2,059), stdev = 0,032

CI (99.9%): [1,930, 2,026] (assumes normal distribution)

# Run complete. Total time: 00:00:21

**X256**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 17,099 ms/op

# Warmup Iteration 2: 16,592 ms/op

# Warmup Iteration 3: 16,242 ms/op

# Warmup Iteration 4: 16,220 ms/op

# Warmup Iteration 5: 16,304 ms/op

Iteration 1: 16,548 ms/op

Iteration 2: 16,209 ms/op

Iteration 3: 16,256 ms/op

Iteration 4: 16,315 ms/op

Iteration 5: 16,346 ms/op

# Run progress: 50,00% complete, ETA 00:00:11

# Fork: 2 of 2

# Warmup Iteration 1: 16,898 ms/op

# Warmup Iteration 2: 16,523 ms/op

# Warmup Iteration 3: 16,335 ms/op

# Warmup Iteration 4: 16,475 ms/op

# Warmup Iteration 5: 15,953 ms/op

Iteration 1: 16,358 ms/op

Iteration 2: 15,984 ms/op

Iteration 3: 16,046 ms/op

Iteration 4: 16,313 ms/op

Iteration 5: 16,294 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

16,267 �(99.9%) 0,242 ms/op [Average]

(min, avg, max) = (15,984, 16,267, 16,548), stdev = 0,160

CI (99.9%): [16,025, 16,509] (assumes normal distribution)

# Run complete. Total time: 00:00:22

**X512**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 154,523 ms/op

# Warmup Iteration 2: 146,570 ms/op

# Warmup Iteration 3: 147,805 ms/op

# Warmup Iteration 4: 147,060 ms/op

# Warmup Iteration 5: 147,252 ms/op

Iteration 1: 145,216 ms/op

Iteration 2: 145,430 ms/op

Iteration 3: 148,608 ms/op

Iteration 4: 146,899 ms/op

Iteration 5: 145,720 ms/op

# Run progress: 50,00% complete, ETA 00:00:11

# Fork: 2 of 2

# Warmup Iteration 1: 145,253 ms/op

# Warmup Iteration 2: 142,326 ms/op

# Warmup Iteration 3: 139,866 ms/op

# Warmup Iteration 4: 138,038 ms/op

# Warmup Iteration 5: 138,357 ms/op

Iteration 1: 137,613 ms/op

Iteration 2: 138,265 ms/op

Iteration 3: 141,980 ms/op

Iteration 4: 137,896 ms/op

Iteration 5: 139,372 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

142,700 �(99.9%) 6,288 ms/op [Average]

(min, avg, max) = (137,613, 142,700, 148,608), stdev = 4,159

CI (99.9%): [136,412, 148,987] (assumes normal distribution)

# Run complete. Total time: 00:00:23

**X1024**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 1308,132 ms/op

# Warmup Iteration 2: 1262,071 ms/op

# Warmup Iteration 3: 1201,612 ms/op

# Warmup Iteration 4: 1198,970 ms/op

# Warmup Iteration 5: 1199,359 ms/op

Iteration 1: 1191,590 ms/op

Iteration 2: 1197,594 ms/op

Iteration 3: 1201,065 ms/op

Iteration 4: 1200,959 ms/op

Iteration 5: 1199,767 ms/op

# Run progress: 50,00% complete, ETA 00:00:13

# Fork: 2 of 2

# Warmup Iteration 1: 1280,978 ms/op

# Warmup Iteration 2: 1277,377 ms/op

# Warmup Iteration 3: 1211,292 ms/op

# Warmup Iteration 4: 1207,518 ms/op

# Warmup Iteration 5: 1194,368 ms/op

Iteration 1: 1190,041 ms/op

Iteration 2: 1184,411 ms/op

Iteration 3: 1197,806 ms/op

Iteration 4: 1193,752 ms/op

Iteration 5: 1197,970 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

1195,495 �(99.9%) 8,217 ms/op [Average]

(min, avg, max) = (1184,411, 1195,495, 1201,065), stdev = 5,435

CI (99.9%): [1187,278, 1203,713] (assumes normal distribution)

# Run complete. Total time: 00:00:26

**X2048**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 10285,303 ms/op

# Warmup Iteration 2: 10268,310 ms/op

# Warmup Iteration 3: 9743,216 ms/op

# Warmup Iteration 4: 9760,734 ms/op

# Warmup Iteration 5: 9784,612 ms/op

Iteration 1: 9767,067 ms/op

Iteration 2: 9814,283 ms/op

Iteration 3: 9778,094 ms/op

Iteration 4: 9781,740 ms/op

Iteration 5: 9735,535 ms/op

# Run progress: 50,00% complete, ETA 00:01:39

# Fork: 2 of 2

# Warmup Iteration 1: 10252,962 ms/op

# Warmup Iteration 2: 10241,621 ms/op

# Warmup Iteration 3: 9702,757 ms/op

# Warmup Iteration 4: 9756,221 ms/op

# Warmup Iteration 5: 9722,302 ms/op

Iteration 1: 9693,661 ms/op

Iteration 2: 9745,656 ms/op

Iteration 3: 9745,116 ms/op

Iteration 4: 9676,208 ms/op

Iteration 5: 9762,496 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

9749,986 �(99.9%) 62,229 ms/op [Average]

(min, avg, max) = (9676,208, 9749,986, 9814,283), stdev = 41,161

CI (99.9%): [9687,757, 9812,214] (assumes normal distribution)

# Run complete. Total time: 00:03:19

**DENSITY 0,9**

**X32**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 0,029 ms/op

# Warmup Iteration 2: 0,028 ms/op

# Warmup Iteration 3: 0,028 ms/op

# Warmup Iteration 4: 0,027 ms/op

# Warmup Iteration 5: 0,028 ms/op

Iteration 1: 0,028 ms/op

Iteration 2: 0,028 ms/op

Iteration 3: 0,028 ms/op

Iteration 4: 0,028 ms/op

Iteration 5: 0,028 ms/op

# Run progress: 50,00% complete, ETA 00:00:11

# Fork: 2 of 2

# Warmup Iteration 1: 0,028 ms/op

# Warmup Iteration 2: 0,027 ms/op

# Warmup Iteration 3: 0,028 ms/op

# Warmup Iteration 4: 0,027 ms/op

# Warmup Iteration 5: 0,028 ms/op

Iteration 1: 0,028 ms/op

Iteration 2: 0,028 ms/op

Iteration 3: 0,028 ms/op

Iteration 4: 0,028 ms/op

Iteration 5: 0,028 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

0,028 �(99.9%) 0,001 ms/op [Average]

(min, avg, max) = (0,028, 0,028, 0,028), stdev = 0,001

CI (99.9%): [0,028, 0,028] (assumes normal distribution)

# Run complete. Total time: 00:00:22

**X64**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 0,254 ms/op

# Warmup Iteration 2: 0,244 ms/op

# Warmup Iteration 3: 0,242 ms/op

# Warmup Iteration 4: 0,238 ms/op

# Warmup Iteration 5: 0,236 ms/op

Iteration 1: 0,235 ms/op

Iteration 2: 0,242 ms/op

Iteration 3: 0,243 ms/op

Iteration 4: 0,238 ms/op

Iteration 5: 0,239 ms/op

# Run progress: 50,00% complete, ETA 00:00:11

# Fork: 2 of 2

# Warmup Iteration 1: 0,247 ms/op

# Warmup Iteration 2: 0,239 ms/op

# Warmup Iteration 3: 0,240 ms/op

# Warmup Iteration 4: 0,237 ms/op

# Warmup Iteration 5: 0,239 ms/op

Iteration 1: 0,241 ms/op

Iteration 2: 0,238 ms/op

Iteration 3: 0,238 ms/op

Iteration 4: 0,237 ms/op

Iteration 5: 0,243 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

0,239 �(99.9%) 0,004 ms/op [Average]

(min, avg, max) = (0,235, 0,239, 0,243), stdev = 0,003

CI (99.9%): [0,235, 0,244] (assumes normal distribution)

# Run complete. Total time: 00:00:22

**X128**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 2,618 ms/op

# Warmup Iteration 2: 2,608 ms/op

# Warmup Iteration 3: 2,585 ms/op

# Warmup Iteration 4: 2,584 ms/op

# Warmup Iteration 5: 2,574 ms/op

Iteration 1: 2,613 ms/op

Iteration 2: 2,607 ms/op

Iteration 3: 2,587 ms/op

Iteration 4: 2,598 ms/op

Iteration 5: 2,579 ms/op

# Run progress: 50,00% complete, ETA 00:00:11

# Fork: 2 of 2

# Warmup Iteration 1: 2,569 ms/op

# Warmup Iteration 2: 2,546 ms/op

# Warmup Iteration 3: 2,533 ms/op

# Warmup Iteration 4: 2,565 ms/op

# Warmup Iteration 5: 2,596 ms/op

Iteration 1: 2,591 ms/op

Iteration 2: 2,595 ms/op

Iteration 3: 2,597 ms/op

Iteration 4: 2,642 ms/op

Iteration 5: 2,589 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

2,600 �(99.9%) 0,027 ms/op [Average]

(min, avg, max) = (2,579, 2,600, 2,642), stdev = 0,018

CI (99.9%): [2,573, 2,627] (assumes normal distribution)

# Run complete. Total time: 00:00:21

**X256**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 17,210 ms/op

# Warmup Iteration 2: 17,053 ms/op

# Warmup Iteration 3: 16,381 ms/op

# Warmup Iteration 4: 16,272 ms/op

# Warmup Iteration 5: 16,483 ms/op

Iteration 1: 16,443 ms/op

Iteration 2: 16,335 ms/op

Iteration 3: 16,643 ms/op

Iteration 4: 16,724 ms/op

Iteration 5: 16,418 ms/op

# Run progress: 50,00% complete, ETA 00:00:11

# Fork: 2 of 2

# Warmup Iteration 1: 16,726 ms/op

# Warmup Iteration 2: 16,645 ms/op

# Warmup Iteration 3: 16,275 ms/op

# Warmup Iteration 4: 16,385 ms/op

# Warmup Iteration 5: 16,108 ms/op

Iteration 1: 16,057 ms/op

Iteration 2: 16,166 ms/op

Iteration 3: 16,304 ms/op

Iteration 4: 16,338 ms/op

Iteration 5: 16,122 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

16,355 �(99.9%) 0,324 ms/op [Average]

(min, avg, max) = (16,057, 16,355, 16,724), stdev = 0,214

CI (99.9%): [16,031, 16,679] (assumes normal distribution)

# Run complete. Total time: 00:00:22

**X512**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 146,989 ms/op

# Warmup Iteration 2: 137,547 ms/op

# Warmup Iteration 3: 136,660 ms/op

# Warmup Iteration 4: 137,628 ms/op

# Warmup Iteration 5: 138,335 ms/op

Iteration 1: 137,817 ms/op

Iteration 2: 136,948 ms/op

Iteration 3: 136,474 ms/op

Iteration 4: 139,320 ms/op

Iteration 5: 139,631 ms/op

# Run progress: 50,00% complete, ETA 00:00:11

# Fork: 2 of 2

# Warmup Iteration 1: 144,995 ms/op

# Warmup Iteration 2: 141,892 ms/op

# Warmup Iteration 3: 139,779 ms/op

# Warmup Iteration 4: 140,790 ms/op

# Warmup Iteration 5: 142,299 ms/op

Iteration 1: 139,998 ms/op

Iteration 2: 139,589 ms/op

Iteration 3: 139,424 ms/op

Iteration 4: 141,307 ms/op

Iteration 5: 142,620 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

139,313 �(99.9%) 2,827 ms/op [Average]

(min, avg, max) = (136,474, 139,313, 142,620), stdev = 1,870

CI (99.9%): [136,486, 142,140] (assumes normal distribution)

# Run complete. Total time: 00:00:23

**X1024**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 1299,457 ms/op

# Warmup Iteration 2: 1289,634 ms/op

# Warmup Iteration 3: 1202,552 ms/op

# Warmup Iteration 4: 1204,683 ms/op

# Warmup Iteration 5: 1212,001 ms/op

Iteration 1: 1196,297 ms/op

Iteration 2: 1191,408 ms/op

Iteration 3: 1206,881 ms/op

Iteration 4: 1230,149 ms/op

Iteration 5: 1191,625 ms/op

# Run progress: 50,00% complete, ETA 00:00:13

# Fork: 2 of 2

# Warmup Iteration 1: 1300,557 ms/op

# Warmup Iteration 2: 1261,616 ms/op

# Warmup Iteration 3: 1182,860 ms/op

# Warmup Iteration 4: 1187,713 ms/op

# Warmup Iteration 5: 1184,951 ms/op

Iteration 1: 1184,774 ms/op

Iteration 2: 1200,458 ms/op

Iteration 3: 1186,748 ms/op

Iteration 4: 1203,715 ms/op

Iteration 5: 1180,788 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

1197,284 �(99.9%) 21,563 ms/op [Average]

(min, avg, max) = (1180,788, 1197,284, 1230,149), stdev = 14,263

CI (99.9%): [1175,721, 1218,847] (assumes normal distribution)

# Run complete. Total time: 00:00:26

**X2048**

# Run progress: 0,00% complete, ETA 00:00:20

# Fork: 1 of 2

# Warmup Iteration 1: 10320,103 ms/op

# Warmup Iteration 2: 10261,334 ms/op

# Warmup Iteration 3: 9836,699 ms/op

# Warmup Iteration 4: 9743,927 ms/op

# Warmup Iteration 5: 9753,927 ms/op

Iteration 1: 9763,821 ms/op

Iteration 2: 9755,826 ms/op

Iteration 3: 9781,960 ms/op

Iteration 4: 9780,210 ms/op

Iteration 5: 9821,392 ms/op

# Run progress: 50,00% complete, ETA 00:01:40

# Fork: 2 of 2

# Warmup Iteration 1: 10320,014 ms/op

# Warmup Iteration 2: 10215,850 ms/op

# Warmup Iteration 3: 9737,033 ms/op

# Warmup Iteration 4: 9720,983 ms/op

# Warmup Iteration 5: 9729,360 ms/op

Iteration 1: 9740,934 ms/op

Iteration 2: 9712,097 ms/op

Iteration 3: 9709,762 ms/op

Iteration 4: 9731,178 ms/op

Iteration 5: 9718,853 ms/op

Result "org.example.MatrixMultiplicationBenchmarking.multiplication":

9751,603 �(99.9%) 54,493 ms/op [Average]

(min, avg, max) = (9709,762, 9751,603, 9821,392), stdev = 36,044

CI (99.9%): [9697,110, 9806,097] (assumes normal distribution)

# Run complete. Total time: 00:03:19

GIVEN MATRIX

# Run progress: 0,00% complete, ETA 00:03:20

# Fork: 1 of 2

# Warmup Iteration 1: Current working directory: D:\Studia\BigData\indiv\Java

1777,544 ms/op

# Warmup Iteration 2: 1000,090 ms/op

# Warmup Iteration 3: 937,971 ms/op

# Warmup Iteration 4: 1024,801 ms/op

# Warmup Iteration 5: 980,779 ms/op

Iteration 1: 944,255 ms/op

Iteration 2: 1016,085 ms/op

Iteration 3: 981,664 ms/op

Iteration 4: 940,813 ms/op

Iteration 5: 950,177 ms/op

# Run progress: 50,00% complete, ETA 00:01:49

# Fork: 2 of 2

# Warmup Iteration 1: Current working directory: D:\Studia\BigData\indiv\Java

1014,249 ms/op

# Warmup Iteration 2: 954,282 ms/op

# Warmup Iteration 3: 954,907 ms/op

# Warmup Iteration 4: 1002,228 ms/op

# Warmup Iteration 5: 953,669 ms/op

Iteration 1: 977,957 ms/op

Iteration 2: 999,548 ms/op

Iteration 3: 1089,459 ms/op

Iteration 4: 1018,451 ms/op

Iteration 5: 1083,406 ms/op

Result "org.example.GivenM.multiplication":

1000,182 �(99.9%) 80,433 ms/op [Average]

(min, avg, max) = (940,813, 1000,182, 1089,459), stdev = 53,201

CI (99.9%): [919,749, 1080,614] (assumes normal distribution)

# Run complete. Total time: 00:03:38