```
/Users/zuzannafurtak/Library/Java/JavaVirtualMachines/
corretto-17.0.8/Contents/Home/bin/java -javaagent:/
Applications/IntelliJ IDEA.app/Contents/lib/idea_rt.
jar=60678:/Applications/IntelliJ IDEA.app/Contents/bin
 -Dfile.encoding=UTF-8 -classpath /Users/zuzannafurtak
/studia/las_palmas/big_data/big-data-tasks/assignment-
2/target/classes:/Users/zuzannafurtak/.m2/repository/
org/openjdk/jmh/jmh-core/1.32/jmh-core-1.32.jar:/Users
/zuzannafurtak/.m2/repository/net/sf/jopt-simple/jopt-
simple/4.6/jopt-simple-4.6.jar:/Users/zuzannafurtak/.
m2/repository/org/apache/commons/commons-math3/3.2/
commons-math3-3.2.jar:/Users/zuzannafurtak/.m2/
repository/org/openjdk/jmh/jmh-generator-annprocess/1.
32/jmh-generator-annprocess-1.32.jar:/Users/
zuzannafurtak/.m2/repository/org/tallison/jmatio/1.5/
jmatio-1.5.jar:/Users/zuzannafurtak/.m2/repository/org
/slf4j/slf4j-api/1.7.25/slf4j-api-1.7.25.jar com.
matrix.MatrixMultiplicationBenchmark
# JMH version: 1.32
# VM version: JDK 17.0.8, OpenJDK 64-Bit Server VM, 17
.0.8+7-LTS
# VM invoker: /Users/zuzannafurtak/Library/Java/
JavaVirtualMachines/corretto-17.0.8/Contents/Home/bin/
java
# VM options: -javaagent:/Applications/IntelliJ IDEA.
app/Contents/lib/idea_rt.jar=60678:/Applications/
IntelliJ IDEA.app/Contents/bin -Dfile.encoding=UTF-8
# Blackhole mode: full + dont-inline hint
# Warmup: 5 iterations, 1 s each
# Measurement: 10 iterations, 1 s each
# Timeout: 10 min per iteration
# Threads: 1 thread, will synchronize iterations
# Benchmark mode: Sampling time
# Benchmark: com.matrix.MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking
# Parameters: (n = 10)

# Run progress: 0.00% complete, ETA 00:02:15
# Fork: 1 of 1
# Warmup Iteration   1: 0.001 ±(99.9%) 0.001 ms/op
# Warmup Iteration   2: 0.001 ±(99.9%) 0.001 ms/op
```

```
# Warmup Iteration   3: 0.001 ±(99.9%) 0.001 ms/op
# Warmup Iteration   4: 0.001 ±(99.9%) 0.001 ms/op
# Warmup Iteration   5: 0.001 ±(99.9%) 0.001 ms/op
Iteration   1: 0.001 ±(99.9%) 0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  0.004 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 0.011 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   0.013 ms/op

Iteration   2: 0.001 ±(99.9%) 0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  0.002 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 0.013 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   0.013 ms/op

Iteration   3: 0.001 ±(99.9%) 0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.00
```

```
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  0.003 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 0.013 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   0.014 ms/op

Iteration   4: 0.001 ±(99.9%) 0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   0.002 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  0.012 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 0.135 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   0.240 ms/op

Iteration   5: 0.001 ±(99.9%) 0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   0.001 ms/op
```

```
                  multiplyMatricesColumnBlocking·p0.95
:   0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  0.005 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 0.013 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   0.013 ms/op

Iteration   6: 0.001 ±(99.9%) 0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  0.004 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 0.014 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   0.056 ms/op

Iteration   7: 0.001 ±(99.9%) 0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.999
```

```
:  0.005 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 0.013 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   0.013 ms/op

Iteration   8: 0.001 ±(99.9%) 0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  0.002 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 0.013 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   0.013 ms/op

Iteration   9: 0.001 ±(99.9%) 0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  0.006 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 0.013 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   0.014 ms/op
```

```
Iteration  10: 0.001 ±(99.9%) 0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  0.005 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 0.013 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   0.016 ms/op



Result "com.matrix.MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking":
  N = 207853
  mean =      0.001 ±(99.9%) 0.001 ms/op

  Histogram, ms/op:
    [0.000, 0.025) = 207847
    [0.025, 0.050) = 1
    [0.050, 0.075) = 1
    [0.075, 0.100) = 1
    [0.100, 0.125) = 1
    [0.125, 0.150) = 1
    [0.150, 0.175) = 0
    [0.175, 0.200) = 0
    [0.200, 0.225) = 0
    [0.225, 0.250) = 1
    [0.250, 0.275) = 0
    [0.275, 0.300) = 0

  Percentiles, ms/op:
```

```
      p(0.0000) =      0.001 ms/op
     p(50.0000) =      0.001 ms/op
     p(90.0000) =      0.001 ms/op
     p(95.0000) =      0.001 ms/op
     p(99.0000) =      0.001 ms/op
     p(99.9000) =      0.005 ms/op
     p(99.9900) =      0.014 ms/op
     p(99.9990) =      0.133 ms/op
     p(99.9999) =      0.240 ms/op
    p(100.0000) =      0.240 ms/op


# JMH version: 1.32
# VM version: JDK 17.0.8, OpenJDK 64-Bit Server VM, 17
.0.8+7-LTS
# VM invoker: /Users/zuzannafurtak/Library/Java/
JavaVirtualMachines/corretto-17.0.8/Contents/Home/bin/
java
# VM options: -javaagent:/Applications/IntelliJ IDEA.
app/Contents/lib/idea_rt.jar=60678:/Applications/
IntelliJ IDEA.app/Contents/bin -Dfile.encoding=UTF-8
# Blackhole mode: full + dont-inline hint
# Warmup: 5 iterations, 1 s each
# Measurement: 10 iterations, 1 s each
# Timeout: 10 min per iteration
# Threads: 1 thread, will synchronize iterations
# Benchmark mode: Sampling time
# Benchmark: com.matrix.MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking
# Parameters: (n = 20)

# Run progress: 11.11% complete, ETA 00:02:04
# Fork: 1 of 1
# Warmup Iteration   1: 0.005 ±(99.9%) 0.001 ms/op
# Warmup Iteration   2: 0.005 ±(99.9%) 0.001 ms/op
# Warmup Iteration   3: 0.005 ±(99.9%) 0.001 ms/op
# Warmup Iteration   4: 0.005 ±(99.9%) 0.001 ms/op
# Warmup Iteration   5: 0.005 ±(99.9%) 0.001 ms/op
Iteration   1: 0.005 ±(99.9%) 0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   0.004 ms/op
```

```
                  multiplyMatricesColumnBlocking·p0.50
:   0.005 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   0.005 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   0.005 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   0.007 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  0.076 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 0.132 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   0.155 ms/op

Iteration   2: 0.005 ±(99.9%) 0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   0.004 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   0.005 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   0.005 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   0.005 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   0.006 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  0.014 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 0.072 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   0.136 ms/op

Iteration   3: 0.005 ±(99.9%) 0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   0.005 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   0.005 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   0.005 ms/op
                  multiplyMatricesColumnBlocking·p0.95
```

```
:   0.005 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   0.006 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  0.013 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 0.017 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   0.018 ms/op

Iteration   4: 0.005 ±(99.9%) 0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   0.004 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   0.005 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   0.005 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   0.005 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   0.006 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  0.013 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 0.018 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   0.020 ms/op

Iteration   5: 0.005 ±(99.9%) 0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   0.004 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   0.005 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   0.005 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   0.005 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   0.006 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  0.013 ms/op
```

```
                  multiplyMatricesColumnBlocking·p0.
9999: 0.018 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   0.018 ms/op

Iteration   6: 0.005 ±(99.9%) 0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   0.004 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   0.005 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   0.005 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   0.005 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   0.006 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  0.013 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 0.025 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   0.039 ms/op

Iteration   7: 0.005 ±(99.9%) 0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   0.004 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   0.005 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   0.005 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   0.005 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   0.006 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  0.013 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 0.019 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   0.027 ms/op
```

```
Iteration   8: 0.005 ±(99.9%) 0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   0.004 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   0.005 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   0.005 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   0.005 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   0.006 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  0.013 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 0.019 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   0.019 ms/op

Iteration   9: 0.005 ±(99.9%) 0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   0.005 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   0.005 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   0.005 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   0.005 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   0.006 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  0.013 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 0.019 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   0.021 ms/op

Iteration  10: 0.005 ±(99.9%) 0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   0.004 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   0.005 ms/op
```

```
                  multiplyMatricesColumnBlocking·p0.90
:   0.005 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   0.005 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   0.006 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  0.013 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 0.040 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   0.070 ms/op



Result "com.matrix.MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking":
  N = 262880
  mean =      0.005 ±(99.9%) 0.001 ms/op

  Histogram, ms/op:
    [0.000, 0.013) = 262393
    [0.013, 0.025) = 376
    [0.025, 0.038) = 36
    [0.038, 0.050) = 21
    [0.050, 0.063) = 15
    [0.063, 0.075) = 10
    [0.075, 0.088) = 12
    [0.088, 0.100) = 10
    [0.100, 0.113) = 1
    [0.113, 0.125) = 2
    [0.125, 0.138) = 3
    [0.138, 0.150) = 0
    [0.150, 0.163) = 1
    [0.163, 0.175) = 0
    [0.175, 0.188) = 0

  Percentiles, ms/op:
      p(0.0000) =      0.004 ms/op
     p(50.0000) =      0.005 ms/op
     p(90.0000) =      0.005 ms/op
```

```
     p(95.0000) =      0.005 ms/op
     p(99.0000) =      0.006 ms/op
     p(99.9000) =      0.015 ms/op
     p(99.9900) =      0.077 ms/op
     p(99.9990) =      0.136 ms/op
     p(99.9999) =      0.155 ms/op
    p(100.0000) =      0.155 ms/op


# JMH version: 1.32
# VM version: JDK 17.0.8, OpenJDK 64-Bit Server VM, 17
.0.8+7-LTS
# VM invoker: /Users/zuzannafurtak/Library/Java/
JavaVirtualMachines/corretto-17.0.8/Contents/Home/bin/
java
# VM options: -javaagent:/Applications/IntelliJ IDEA.
app/Contents/lib/idea_rt.jar=60678:/Applications/
IntelliJ IDEA.app/Contents/bin -Dfile.encoding=UTF-8
# Blackhole mode: full + dont-inline hint
# Warmup: 5 iterations, 1 s each
# Measurement: 10 iterations, 1 s each
# Timeout: 10 min per iteration
# Threads: 1 thread, will synchronize iterations
# Benchmark mode: Sampling time
# Benchmark: com.matrix.MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking
# Parameters: (n = 50)

# Run progress: 22.22% complete, ETA 00:01:49
# Fork: 1 of 1
# Warmup Iteration   1: 0.046 ±(99.9%) 0.001 ms/op
# Warmup Iteration   2: 0.045 ±(99.9%) 0.001 ms/op
# Warmup Iteration   3: 0.046 ±(99.9%) 0.001 ms/op
# Warmup Iteration   4: 0.048 ±(99.9%) 0.001 ms/op
# Warmup Iteration   5: 0.048 ±(99.9%) 0.001 ms/op
Iteration   1: 0.048 ±(99.9%) 0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   0.048 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   0.048 ms/op
                 multiplyMatricesColumnBlocking·p0.90
```

```
:   0.048 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   0.051 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   0.057 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  0.063 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 0.069 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   0.069 ms/op

Iteration   2: 0.048 ±(99.9%) 0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   0.048 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   0.048 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   0.048 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   0.052 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   0.059 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  0.064 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 0.073 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   0.073 ms/op

Iteration   3: 0.048 ±(99.9%) 0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   0.048 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   0.048 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   0.048 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   0.052 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   0.059 ms/op
```

```
                  multiplyMatricesColumnBlocking·p0.999
:  0.064 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 0.072 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   0.072 ms/op

Iteration   4: 0.048 ±(99.9%) 0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   0.044 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   0.048 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   0.048 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   0.052 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   0.058 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  0.063 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 0.088 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   0.089 ms/op

Iteration   5: 0.048 ±(99.9%) 0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   0.048 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   0.048 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   0.049 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   0.052 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   0.059 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  0.063 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 0.072 ms/op
                  multiplyMatricesColumnBlocking·p1.00
```

```
:   0.072 ms/op

Iteration   6: 0.048 ±(99.9%) 0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   0.048 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   0.048 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   0.049 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   0.052 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   0.059 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  0.063 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 0.110 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   0.111 ms/op

Iteration   7: 0.048 ±(99.9%) 0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   0.048 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   0.048 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   0.049 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   0.052 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   0.059 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  0.063 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 0.066 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   0.066 ms/op

Iteration   8: 0.048 ±(99.9%) 0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   0.048 ms/op
```

```
                  multiplyMatricesColumnBlocking·p0.50
:   0.048 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   0.048 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   0.052 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   0.059 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  0.063 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 0.066 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   0.066 ms/op

Iteration   9: 0.049 ±(99.9%) 0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   0.046 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   0.048 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   0.051 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   0.053 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   0.059 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  0.063 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 0.070 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   0.070 ms/op

Iteration  10: 0.048 ±(99.9%) 0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   0.048 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   0.048 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   0.048 ms/op
                  multiplyMatricesColumnBlocking·p0.95
```

```
:   0.052 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   0.059 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  0.064 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 0.073 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   0.073 ms/op



Result "com.matrix.MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking":
  N = 103416
  mean =      0.048 ±(99.9%) 0.001 ms/op

  Histogram, ms/op:
    [0.040, 0.045) = 3
    [0.045, 0.050) = 95163
    [0.050, 0.055) = 5476
    [0.055, 0.060) = 2126
    [0.060, 0.065) = 604
    [0.065, 0.070) = 33
    [0.070, 0.075) = 9
    [0.075, 0.080) = 0
    [0.080, 0.085) = 0
    [0.085, 0.090) = 1
    [0.090, 0.095) = 0
    [0.095, 0.100) = 0
    [0.100, 0.105) = 0
    [0.105, 0.110) = 0
    [0.110, 0.115) = 1

  Percentiles, ms/op:
      p(0.0000) =      0.044 ms/op
     p(50.0000) =      0.048 ms/op
     p(90.0000) =      0.049 ms/op
     p(95.0000) =      0.052 ms/op
     p(99.0000) =      0.059 ms/op
     p(99.9000) =      0.063 ms/op
```

```
     p(99.9900) =      0.070 ms/op
     p(99.9990) =      0.110 ms/op
     p(99.9999) =      0.111 ms/op
    p(100.0000) =      0.111 ms/op


# JMH version: 1.32
# VM version: JDK 17.0.8, OpenJDK 64-Bit Server VM, 17
.0.8+7-LTS
# VM invoker: /Users/zuzannafurtak/Library/Java/
JavaVirtualMachines/corretto-17.0.8/Contents/Home/bin/
java
# VM options: -javaagent:/Applications/IntelliJ IDEA.
app/Contents/lib/idea_rt.jar=60678:/Applications/
IntelliJ IDEA.app/Contents/bin -Dfile.encoding=UTF-8
# Blackhole mode: full + dont-inline hint
# Warmup: 5 iterations, 1 s each
# Measurement: 10 iterations, 1 s each
# Timeout: 10 min per iteration
# Threads: 1 thread, will synchronize iterations
# Benchmark mode: Sampling time
# Benchmark: com.matrix.MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking
# Parameters: (n = 100)

# Run progress: 33.33% complete, ETA 00:01:33
# Fork: 1 of 1
# Warmup Iteration   1: 0.341 ±(99.9%) 0.008 ms/op
# Warmup Iteration   2: 0.335 ±(99.9%) 0.001 ms/op
# Warmup Iteration   3: 0.334 ±(99.9%) 0.001 ms/op
# Warmup Iteration   4: 0.333 ±(99.9%) 0.001 ms/op
# Warmup Iteration   5: 0.334 ±(99.9%) 0.001 ms/op
Iteration   1: 0.335 ±(99.9%) 0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   0.309 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   0.332 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   0.342 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   0.346 ms/op
```

```
                  multiplyMatricesColumnBlocking·p0.99
:   0.367 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  0.421 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 0.422 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   0.422 ms/op

Iteration   2: 0.334 ±(99.9%) 0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   0.309 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   0.331 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   0.343 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   0.349 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   0.371 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  0.418 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 0.427 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   0.427 ms/op

Iteration   3: 0.334 ±(99.9%) 0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   0.329 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   0.331 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   0.343 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   0.349 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   0.370 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  0.414 ms/op
                  multiplyMatricesColumnBlocking·p0.
```

```
9999: 0.420 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   0.420 ms/op

Iteration   4: 0.334 ±(99.9%) 0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   0.329 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   0.331 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   0.343 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   0.349 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   0.370 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  0.418 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 0.425 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   0.425 ms/op

Iteration   5: 0.335 ±(99.9%) 0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   0.330 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   0.332 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   0.343 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   0.349 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   0.372 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  0.422 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 0.445 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   0.445 ms/op

Iteration   6: 0.336 ±(99.9%) 0.001 ms/op
```

```
                  multiplyMatricesColumnBlocking·p0.00
:   0.330 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   0.333 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   0.344 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   0.350 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   0.373 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  0.427 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 0.441 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   0.441 ms/op

Iteration   7: 0.336 ±(99.9%) 0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   0.331 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   0.333 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   0.345 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   0.350 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   0.372 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  0.419 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 0.426 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   0.426 ms/op

Iteration   8: 0.336 ±(99.9%) 0.001 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   0.331 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   0.333 ms/op
                  multiplyMatricesColumnBlocking·p0.90
```

```
:   0.345 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   0.352 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   0.372 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  0.416 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 0.432 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   0.432 ms/op

Iteration   9: 0.337 ±(99.9%) 0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   0.331 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   0.333 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   0.345 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   0.352 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   0.384 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  0.530 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 0.670 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   0.670 ms/op

Iteration  10: 0.335 ±(99.9%) 0.001 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   0.331 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   0.332 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   0.344 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   0.350 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   0.372 ms/op
```

```
                  multiplyMatricesColumnBlocking·p0.999
:  0.415 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 0.427 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   0.427 ms/op



Result "com.matrix.MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking":
  N = 29909
  mean =      0.335 ±(99.9%) 0.001 ms/op

  Histogram, ms/op:
    [0.300, 0.325) = 7
    [0.325, 0.350) = 28459
    [0.350, 0.375) = 1199
    [0.375, 0.400) = 172
    [0.400, 0.425) = 57
    [0.425, 0.450) = 9
    [0.450, 0.475) = 2
    [0.475, 0.500) = 1
    [0.500, 0.525) = 0
    [0.525, 0.550) = 1
    [0.550, 0.575) = 1
    [0.575, 0.600) = 0
    [0.600, 0.625) = 0
    [0.625, 0.650) = 0
    [0.650, 0.675) = 1

  Percentiles, ms/op:
      p(0.0000) =      0.309 ms/op
     p(50.0000) =      0.332 ms/op
     p(90.0000) =      0.344 ms/op
     p(95.0000) =      0.350 ms/op
     p(99.0000) =      0.372 ms/op
     p(99.9000) =      0.421 ms/op
     p(99.9900) =      0.530 ms/op
     p(99.9990) =      0.670 ms/op
     p(99.9999) =      0.670 ms/op
```

```
    p(100.0000) =      0.670 ms/op


# JMH version: 1.32
# VM version: JDK 17.0.8, OpenJDK 64-Bit Server VM, 17
.0.8+7-LTS
# VM invoker: /Users/zuzannafurtak/Library/Java/
JavaVirtualMachines/corretto-17.0.8/Contents/Home/bin/
java
# VM options: -javaagent:/Applications/IntelliJ IDEA.
app/Contents/lib/idea_rt.jar=60678:/Applications/
IntelliJ IDEA.app/Contents/bin -Dfile.encoding=UTF-8
# Blackhole mode: full + dont-inline hint
# Warmup: 5 iterations, 1 s each
# Measurement: 10 iterations, 1 s each
# Timeout: 10 min per iteration
# Threads: 1 thread, will synchronize iterations
# Benchmark mode: Sampling time
# Benchmark: com.matrix.MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking
# Parameters: (n = 200)

# Run progress: 44.44% complete, ETA 00:01:18
# Fork: 1 of 1
# Warmup Iteration   1: 2.652 ±(99.9%) 0.084 ms/op
# Warmup Iteration   2: 2.617 ±(99.9%) 0.005 ms/op
# Warmup Iteration   3: 2.616 ±(99.9%) 0.006 ms/op
# Warmup Iteration   4: 2.620 ±(99.9%) 0.006 ms/op
# Warmup Iteration   5: 2.616 ±(99.9%) 0.006 ms/op
Iteration   1: 2.616 ±(99.9%) 0.005 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   2.589 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   2.609 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   2.640 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   2.654 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   2.765 ms/op
                 multiplyMatricesColumnBlocking·p0.999
```

```
:  2.916 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 2.916 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   2.916 ms/op

Iteration   2: 2.624 ±(99.9%) 0.007 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   2.589 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   2.613 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   2.662 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   2.695 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   2.769 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  3.109 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 3.109 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   3.109 ms/op

Iteration   3: 2.621 ±(99.9%) 0.007 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   2.585 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   2.613 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   2.658 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   2.683 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   2.740 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  3.166 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 3.166 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   3.166 ms/op
```

```
Iteration   4: 2.624 ±(99.9%) 0.006 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   2.589 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   2.613 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   2.658 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   2.695 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   2.757 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  3.043 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 3.043 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   3.043 ms/op

Iteration   5: 2.624 ±(99.9%) 0.007 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   2.589 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   2.613 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   2.662 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   2.687 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   2.776 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  3.146 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 3.146 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   3.146 ms/op

Iteration   6: 2.624 ±(99.9%) 0.007 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   2.589 ms/op
                 multiplyMatricesColumnBlocking·p0.50
```

```
:   2.613 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   2.658 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   2.686 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   2.774 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  3.109 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 3.109 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   3.109 ms/op

Iteration   7: 2.623 ±(99.9%) 0.007 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   2.589 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   2.613 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   2.654 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   2.683 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   2.831 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  3.076 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 3.076 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   3.076 ms/op

Iteration   8: 2.623 ±(99.9%) 0.006 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   2.589 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   2.613 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   2.658 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   2.695 ms/op
```

```
                  multiplyMatricesColumnBlocking·p0.99
:   2.783 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  2.986 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 2.986 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   2.986 ms/op

Iteration   9: 2.622 ±(99.9%) 0.007 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   2.585 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   2.613 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   2.661 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   2.698 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   2.777 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  2.982 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 2.982 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   2.982 ms/op

Iteration  10: 2.624 ±(99.9%) 0.007 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   2.585 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   2.613 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   2.658 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   2.691 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   2.782 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  3.154 ms/op
                  multiplyMatricesColumnBlocking·p0.
```

```
9999: 3.154 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   3.154 ms/op



Result "com.matrix.MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking":
  N = 3828
  mean =      2.622 ±(99.9%) 0.002 ms/op

  Histogram, ms/op:
    [2.500, 2.550) = 0
    [2.550, 2.600) = 633
    [2.600, 2.650) = 2706
    [2.650, 2.700) = 358
    [2.700, 2.750) = 88
    [2.750, 2.800) = 18
    [2.800, 2.850) = 6
    [2.850, 2.900) = 5
    [2.900, 2.950) = 5
    [2.950, 3.000) = 2
    [3.000, 3.050) = 1
    [3.050, 3.100) = 1
    [3.100, 3.150) = 3
    [3.150, 3.200) = 2

  Percentiles, ms/op:
      p(0.0000) =      2.585 ms/op
     p(50.0000) =      2.613 ms/op
     p(90.0000) =      2.658 ms/op
     p(95.0000) =      2.687 ms/op
     p(99.0000) =      2.757 ms/op
     p(99.9000) =      3.115 ms/op
     p(99.9900) =      3.166 ms/op
     p(99.9990) =      3.166 ms/op
     p(99.9999) =      3.166 ms/op
    p(100.0000) =      3.166 ms/op


# JMH version: 1.32
```

```
# VM version: JDK 17.0.8, OpenJDK 64-Bit Server VM, 17
.0.8+7-LTS
# VM invoker: /Users/zuzannafurtak/Library/Java/
JavaVirtualMachines/corretto-17.0.8/Contents/Home/bin/
java
# VM options: -javaagent:/Applications/IntelliJ IDEA.
app/Contents/lib/idea_rt.jar=60678:/Applications/
IntelliJ IDEA.app/Contents/bin -Dfile.encoding=UTF-8
# Blackhole mode: full + dont-inline hint
# Warmup: 5 iterations, 1 s each
# Measurement: 10 iterations, 1 s each
# Timeout: 10 min per iteration
# Threads: 1 thread, will synchronize iterations
# Benchmark mode: Sampling time
# Benchmark: com.matrix.MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking
# Parameters: (n = 500)

# Run progress: 55.56% complete, ETA 00:01:02
# Fork: 1 of 1
# Warmup Iteration   1: 39.266 ±(99.9%) 2.096 ms/op
# Warmup Iteration   2: 38.588 ±(99.9%) 0.144 ms/op
# Warmup Iteration   3: 38.558 ±(99.9%) 0.124 ms/op
# Warmup Iteration   4: 38.588 ±(99.9%) 0.129 ms/op
# Warmup Iteration   5: 38.568 ±(99.9%) 0.115 ms/op
Iteration   1: 38.627 ±(99.9%) 0.181 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   38.404 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   38.535 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   38.928 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   39.361 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   39.649 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  39.649 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 39.649 ms/op
                 multiplyMatricesColumnBlocking·p1.00
```

```
:   39.649 ms/op

Iteration   2: 38.686 ±(99.9%) 0.224 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   38.404 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   38.601 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   39.177 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   39.495 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   39.518 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  39.518 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 39.518 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   39.518 ms/op

Iteration   3: 38.679 ±(99.9%) 0.228 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   38.404 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   38.502 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   39.276 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   39.492 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   39.584 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  39.584 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 39.584 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   39.584 ms/op

Iteration   4: 38.659 ±(99.9%) 0.210 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   38.404 ms/op
```

```
                  multiplyMatricesColumnBlocking·p0.50
:   38.535 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   39.210 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   39.384 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   39.453 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  39.453 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 39.453 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   39.453 ms/op

Iteration   5: 38.659 ±(99.9%) 0.201 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   38.404 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   38.535 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   39.230 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   39.364 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   39.387 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  39.387 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 39.387 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   39.387 ms/op

Iteration   6: 38.691 ±(99.9%) 0.251 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   38.404 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   38.535 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   39.426 ms/op
                  multiplyMatricesColumnBlocking·p0.95
```

```
:   39.561 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   39.584 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  39.584 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 39.584 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   39.584 ms/op

Iteration   7: 38.686 ±(99.9%) 0.216 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   38.404 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   38.568 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   39.295 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   39.430 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   39.453 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  39.453 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 39.453 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   39.453 ms/op

Iteration   8: 38.734 ±(99.9%) 0.307 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   38.339 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   38.568 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   39.335 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   39.987 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   40.239 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  40.239 ms/op
```

```
                  multiplyMatricesColumnBlocking·p0.
9999: 40.239 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   40.239 ms/op

Iteration   9: 38.654 ±(99.9%) 0.220 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   38.404 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   38.502 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   39.250 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   39.430 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   39.453 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  39.453 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 39.453 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   39.453 ms/op

Iteration  10: 38.676 ±(99.9%) 0.219 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   38.404 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   38.568 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   39.250 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   39.430 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   39.453 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  39.453 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 39.453 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   39.453 ms/op
```

```
Result "com.matrix.MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking":
  N = 261
  mean =     38.675 ±(99.9%) 0.063 ms/op

  Histogram, ms/op:
    [38.000, 38.250) = 0
    [38.250, 38.500) = 107
    [38.500, 38.750) = 84
    [38.750, 39.000) = 40
    [39.000, 39.250) = 7
    [39.250, 39.500) = 16
    [39.500, 39.750) = 6
    [39.750, 40.000) = 0
    [40.000, 40.250) = 1
    [40.250, 40.500) = 0
    [40.500, 40.750) = 0

  Percentiles, ms/op:
      p(0.0000) =     38.339 ms/op
     p(50.0000) =     38.535 ms/op
     p(90.0000) =     39.191 ms/op
     p(95.0000) =     39.387 ms/op
     p(99.0000) =     39.609 ms/op
     p(99.9000) =     40.239 ms/op
     p(99.9900) =     40.239 ms/op
     p(99.9990) =     40.239 ms/op
     p(99.9999) =     40.239 ms/op
    p(100.0000) =     40.239 ms/op


# JMH version: 1.32
# VM version: JDK 17.0.8, OpenJDK 64-Bit Server VM, 17
.0.8+7-LTS
# VM invoker: /Users/zuzannafurtak/Library/Java/
JavaVirtualMachines/corretto-17.0.8/Contents/Home/bin/
java
# VM options: -javaagent:/Applications/IntelliJ IDEA.
app/Contents/lib/idea_rt.jar=60678:/Applications/
```

```
IntelliJ IDEA.app/Contents/bin -Dfile.encoding=UTF-8
# Blackhole mode: full + dont-inline hint
# Warmup: 5 iterations, 1 s each
# Measurement: 10 iterations, 1 s each
# Timeout: 10 min per iteration
# Threads: 1 thread, will synchronize iterations
# Benchmark mode: Sampling time
# Benchmark: com.matrix.MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking
# Parameters: (n = 1000)

# Run progress: 66.67% complete, ETA 00:00:46
# Fork: 1 of 1
# Warmup Iteration   1: 299.368 ±(99.9%) 46.039 ms/op
# Warmup Iteration   2: 308.412 ±(99.9%) 8.910 ms/op
# Warmup Iteration   3: 308.019 ±(99.9%) 8.065 ms/op
# Warmup Iteration   4: 307.757 ±(99.9%) 7.319 ms/op
# Warmup Iteration   5: 307.888 ±(99.9%) 6.984 ms/op
Iteration   1: 308.019 ±(99.9%) 10.164 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   307.233 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   307.233 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   310.378 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   310.378 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   310.378 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  310.378 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 310.378 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   310.378 ms/op

Iteration   2: 309.592 ±(99.9%) 26.316 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   306.708 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   308.019 ms/op
```

```
                  multiplyMatricesColumnBlocking·p0.90
:   315.621 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   315.621 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   315.621 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  315.621 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 315.621 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   315.621 ms/op

Iteration   3: 308.412 ±(99.9%) 15.495 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   306.708 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   307.495 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   311.951 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   311.951 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   311.951 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  311.951 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 311.951 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   311.951 ms/op

Iteration   4: 308.281 ±(99.9%) 13.831 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   306.708 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   307.495 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   311.427 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   311.427 ms/op
                  multiplyMatricesColumnBlocking·p0.99
```

```
:   311.427 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  311.427 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 311.427 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   311.427 ms/op

Iteration   5: 308.675 ±(99.9%) 12.176 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   307.233 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   308.019 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   311.427 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   311.427 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   311.427 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  311.427 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 311.427 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   311.427 ms/op

Iteration   6: 308.806 ±(99.9%) 14.374 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   307.233 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   308.019 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   311.951 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   311.951 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   311.951 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  311.951 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 311.951 ms/op
```

```
                  multiplyMatricesColumnBlocking·p1.00
:   311.951 ms/op

Iteration   7: 308.281 ±(99.9%) 11.736 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   306.708 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   307.757 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   310.903 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   310.903 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   310.903 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  310.903 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 310.903 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   310.903 ms/op

Iteration   8: 308.543 ±(99.9%) 12.827 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   307.233 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   307.757 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   311.427 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   311.427 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   311.427 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  311.427 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 311.427 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   311.427 ms/op

Iteration   9: 308.281 ±(99.9%) 13.831 ms/op
                  multiplyMatricesColumnBlocking·p0.00
```

```
:   306.708 ms/op
                multiplyMatricesColumnBlocking·p0.50
:   307.495 ms/op
                multiplyMatricesColumnBlocking·p0.90
:   311.427 ms/op
                multiplyMatricesColumnBlocking·p0.95
:   311.427 ms/op
                multiplyMatricesColumnBlocking·p0.99
:   311.427 ms/op
                multiplyMatricesColumnBlocking·p0.999
:  311.427 ms/op
                multiplyMatricesColumnBlocking·p0.
9999: 311.427 ms/op
                multiplyMatricesColumnBlocking·p1.00
:   311.427 ms/op

Iteration  10: 308.412 ±(99.9%) 15.246 ms/op
                multiplyMatricesColumnBlocking·p0.00
:   307.233 ms/op
                multiplyMatricesColumnBlocking·p0.50
:   307.233 ms/op
                multiplyMatricesColumnBlocking·p0.90
:   311.951 ms/op
                multiplyMatricesColumnBlocking·p0.95
:   311.951 ms/op
                multiplyMatricesColumnBlocking·p0.99
:   311.951 ms/op
                multiplyMatricesColumnBlocking·p0.999
:  311.951 ms/op
                multiplyMatricesColumnBlocking·p0.
9999: 311.951 ms/op
                multiplyMatricesColumnBlocking·p1.00
:   311.951 ms/op



Result "com.matrix.MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking":
  N = 40
  mean =    308.530 ±(99.9%) 1.184 ms/op
```

```
  Histogram, ms/op:
    [306.000, 307.000) = 5
    [307.000, 308.000) = 21
    [308.000, 309.000) = 4
    [309.000, 310.000) = 0
    [310.000, 311.000) = 2
    [311.000, 312.000) = 7
    [312.000, 313.000) = 0
    [313.000, 314.000) = 0
    [314.000, 315.000) = 0

  Percentiles, ms/op:
      p(0.0000) =    306.708 ms/op
     p(50.0000) =    307.757 ms/op
     p(90.0000) =    311.899 ms/op
     p(95.0000) =    311.951 ms/op
     p(99.0000) =    315.621 ms/op
     p(99.9000) =    315.621 ms/op
     p(99.9900) =    315.621 ms/op
     p(99.9990) =    315.621 ms/op
     p(99.9999) =    315.621 ms/op
    p(100.0000) =    315.621 ms/op


# JMH version: 1.32
# VM version: JDK 17.0.8, OpenJDK 64-Bit Server VM, 17
.0.8+7-LTS
# VM invoker: /Users/zuzannafurtak/Library/Java/
JavaVirtualMachines/corretto-17.0.8/Contents/Home/bin/
java
# VM options: -javaagent:/Applications/IntelliJ IDEA.
app/Contents/lib/idea_rt.jar=60678:/Applications/
IntelliJ IDEA.app/Contents/bin -Dfile.encoding=UTF-8
# Blackhole mode: full + dont-inline hint
# Warmup: 5 iterations, 1 s each
# Measurement: 10 iterations, 1 s each
# Timeout: 10 min per iteration
# Threads: 1 thread, will synchronize iterations
# Benchmark mode: Sampling time
# Benchmark: com.matrix.MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking
```

```
# Parameters: (n = 1500)

# Run progress: 77.78% complete, ETA 00:00:32
# Fork: 1 of 1
# Warmup Iteration   1: 1103.102 ms/op
# Warmup Iteration   2: 1096.810 ms/op
# Warmup Iteration   3: 1077.936 ms/op
# Warmup Iteration   4: 1080.033 ms/op
# Warmup Iteration   5: 1077.936 ms/op
Iteration   1: 1080.033 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   1080.033 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   1080.033 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   1080.033 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   1080.033 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   1080.033 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  1080.033 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 1080.033 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   1080.033 ms/op

Iteration   2: 1084.228 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   1084.228 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   1084.228 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   1084.228 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   1084.228 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   1084.228 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  1084.228 ms/op
                 multiplyMatricesColumnBlocking·p0.
```

```
9999: 1084.228 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   1084.228 ms/op

Iteration   3: 1080.033 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   1080.033 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   1080.033 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   1080.033 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   1080.033 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   1080.033 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  1080.033 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 1080.033 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   1080.033 ms/op

Iteration   4: 1084.228 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   1084.228 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   1084.228 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   1084.228 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   1084.228 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   1084.228 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  1084.228 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 1084.228 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   1084.228 ms/op

Iteration   5: 1082.130 ms/op
```

```
                  multiplyMatricesColumnBlocking·p0.00
:   1082.130 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   1082.130 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   1082.130 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   1082.130 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   1082.130 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  1082.130 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 1082.130 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   1082.130 ms/op

Iteration   6: 1084.228 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   1084.228 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   1084.228 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   1084.228 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   1084.228 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   1084.228 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  1084.228 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 1084.228 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   1084.228 ms/op

Iteration   7: 1082.130 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   1082.130 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   1082.130 ms/op
                  multiplyMatricesColumnBlocking·p0.90
```

```
:   1082.130 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   1082.130 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   1082.130 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  1082.130 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 1082.130 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   1082.130 ms/op

Iteration   8: 1082.130 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   1082.130 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   1082.130 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   1082.130 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   1082.130 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   1082.130 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  1082.130 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 1082.130 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   1082.130 ms/op

Iteration   9: 1082.130 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   1082.130 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   1082.130 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   1082.130 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   1082.130 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   1082.130 ms/op
```

```
                  multiplyMatricesColumnBlocking·p0.999
:  1082.130 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 1082.130 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   1082.130 ms/op

Iteration  10: 1082.130 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   1082.130 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   1082.130 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   1082.130 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   1082.130 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   1082.130 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  1082.130 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 1082.130 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   1082.130 ms/op



Result "com.matrix.MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking":
  N = 10
  mean =   1082.340 ±(99.9%) 2.339 ms/op

  Histogram, ms/op:
    [1080.000, 1080.500) = 2
    [1080.500, 1081.000) = 0
    [1081.000, 1081.500) = 0
    [1081.500, 1082.000) = 0
    [1082.000, 1082.500) = 5
    [1082.500, 1083.000) = 0
    [1083.000, 1083.500) = 0
    [1083.500, 1084.000) = 0
```

```
    [1084.000, 1084.500) = 3

  Percentiles, ms/op:
      p(0.0000) =   1080.033 ms/op
     p(50.0000) =   1082.130 ms/op
     p(90.0000) =   1084.228 ms/op
     p(95.0000) =   1084.228 ms/op
     p(99.0000) =   1084.228 ms/op
     p(99.9000) =   1084.228 ms/op
     p(99.9900) =   1084.228 ms/op
     p(99.9990) =   1084.228 ms/op
     p(99.9999) =   1084.228 ms/op
    p(100.0000) =   1084.228 ms/op


# JMH version: 1.32
# VM version: JDK 17.0.8, OpenJDK 64-Bit Server VM, 17
.0.8+7-LTS
# VM invoker: /Users/zuzannafurtak/Library/Java/
JavaVirtualMachines/corretto-17.0.8/Contents/Home/bin/
java
# VM options: -javaagent:/Applications/IntelliJ IDEA.
app/Contents/lib/idea_rt.jar=60678:/Applications/
IntelliJ IDEA.app/Contents/bin -Dfile.encoding=UTF-8
# Blackhole mode: full + dont-inline hint
# Warmup: 5 iterations, 1 s each
# Measurement: 10 iterations, 1 s each
# Timeout: 10 min per iteration
# Threads: 1 thread, will synchronize iterations
# Benchmark mode: Sampling time
# Benchmark: com.matrix.MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking
# Parameters: (n = 2000)

# Run progress: 88.89% complete, ETA 00:00:16
# Fork: 1 of 1
# Warmup Iteration   1: 2508.194 ms/op
# Warmup Iteration   2: 2499.805 ms/op
# Warmup Iteration   3: 2483.028 ms/op
# Warmup Iteration   4: 2491.417 ms/op
# Warmup Iteration   5: 2483.028 ms/op
```

```
Iteration   1: 2478.834 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   2478.834 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   2478.834 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   2478.834 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   2478.834 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   2478.834 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  2478.834 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 2478.834 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   2478.834 ms/op

Iteration   2: 2487.222 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   2487.222 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   2487.222 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   2487.222 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   2487.222 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   2487.222 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  2487.222 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 2487.222 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   2487.222 ms/op

Iteration   3: 2487.222 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   2487.222 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   2487.222 ms/op
```

```
                  multiplyMatricesColumnBlocking·p0.90
:   2487.222 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   2487.222 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   2487.222 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  2487.222 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 2487.222 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   2487.222 ms/op

Iteration   4: 2491.417 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   2491.417 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   2491.417 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   2491.417 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   2491.417 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   2491.417 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  2491.417 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 2491.417 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   2491.417 ms/op

Iteration   5: 2483.028 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   2483.028 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   2483.028 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   2483.028 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   2483.028 ms/op
                  multiplyMatricesColumnBlocking·p0.99
```

```
:   2483.028 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  2483.028 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 2483.028 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   2483.028 ms/op

Iteration   6: 2487.222 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   2487.222 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   2487.222 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   2487.222 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   2487.222 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   2487.222 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  2487.222 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 2487.222 ms/op
                 multiplyMatricesColumnBlocking·p1.00
:   2487.222 ms/op

Iteration   7: 2483.028 ms/op
                 multiplyMatricesColumnBlocking·p0.00
:   2483.028 ms/op
                 multiplyMatricesColumnBlocking·p0.50
:   2483.028 ms/op
                 multiplyMatricesColumnBlocking·p0.90
:   2483.028 ms/op
                 multiplyMatricesColumnBlocking·p0.95
:   2483.028 ms/op
                 multiplyMatricesColumnBlocking·p0.99
:   2483.028 ms/op
                 multiplyMatricesColumnBlocking·p0.999
:  2483.028 ms/op
                 multiplyMatricesColumnBlocking·p0.
9999: 2483.028 ms/op
```

```
                  multiplyMatricesColumnBlocking·p1.00
:   2483.028 ms/op

Iteration   8: 2487.222 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   2487.222 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   2487.222 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   2487.222 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   2487.222 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   2487.222 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  2487.222 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 2487.222 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   2487.222 ms/op

Iteration   9: 2487.222 ms/op
                  multiplyMatricesColumnBlocking·p0.00
:   2487.222 ms/op
                  multiplyMatricesColumnBlocking·p0.50
:   2487.222 ms/op
                  multiplyMatricesColumnBlocking·p0.90
:   2487.222 ms/op
                  multiplyMatricesColumnBlocking·p0.95
:   2487.222 ms/op
                  multiplyMatricesColumnBlocking·p0.99
:   2487.222 ms/op
                  multiplyMatricesColumnBlocking·p0.999
:  2487.222 ms/op
                  multiplyMatricesColumnBlocking·p0.
9999: 2487.222 ms/op
                  multiplyMatricesColumnBlocking·p1.00
:   2487.222 ms/op

Iteration  10: 2487.222 ms/op
                  multiplyMatricesColumnBlocking·p0.00
```

```
:   2487.222 ms/op
                multiplyMatricesColumnBlocking·p0.50
:   2487.222 ms/op
                multiplyMatricesColumnBlocking·p0.90
:   2487.222 ms/op
                multiplyMatricesColumnBlocking·p0.95
:   2487.222 ms/op
                multiplyMatricesColumnBlocking·p0.99
:   2487.222 ms/op
                multiplyMatricesColumnBlocking·p0.999
:  2487.222 ms/op
                multiplyMatricesColumnBlocking·p0.
9999: 2487.222 ms/op
                multiplyMatricesColumnBlocking·p1.00
:   2487.222 ms/op



Result "com.matrix.MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking":
  N = 10
  mean =   2485.964 ±(99.9%) 5.221 ms/op

  Histogram, ms/op:
    [2470.000, 2472.500) = 0
    [2472.500, 2475.000) = 0
    [2475.000, 2477.500) = 0
    [2477.500, 2480.000) = 1
    [2480.000, 2482.500) = 0
    [2482.500, 2485.000) = 2
    [2485.000, 2487.500) = 6
    [2487.500, 2490.000) = 0
    [2490.000, 2492.500) = 1
    [2492.500, 2495.000) = 0
    [2495.000, 2497.500) = 0

  Percentiles, ms/op:
      p(0.0000) =   2478.834 ms/op
     p(50.0000) =   2487.222 ms/op
     p(90.0000) =   2490.997 ms/op
     p(95.0000) =   2491.417 ms/op
```

```
     p(99.0000) =   2491.417 ms/op
     p(99.9000) =   2491.417 ms/op
     p(99.9900) =   2491.417 ms/op
     p(99.9990) =   2491.417 ms/op
     p(99.9999) =   2491.417 ms/op
    p(100.0000) =   2491.417 ms/op


# Run complete. Total time: 00:02:47

REMEMBER: The numbers below are just data. To gain
reusable insights, you need to follow up on
why the numbers are the way they are. Use profilers (
see -prof, -lprof), design factorial
experiments, perform baseline and negative tests that
provide experimental control, make sure
the benchmarking environment is safe on JVM/OS/HW
level, ask for reviews from the domain experts.
Do not assume the numbers tell you what you want them
to tell.

Benchmark

                                          (n)    Mode
     Cnt     Score    Error  Units
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking
                                            10  sample
  207853     0.001 ±  0.001  ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.00      10  sample
             0.001           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.50      10  sample
             0.001           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.90      10  sample
             0.001           ms/op
```

```
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.95      10  sample
             0.001           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.99      10  sample
             0.001           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.999     10  sample
             0.005           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.9999    10  sample
             0.014           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p1.00      10  sample
             0.240           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking
                                           20  sample
  262880     0.005 ±  0.001  ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.00      20  sample
             0.004           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.50      20  sample
             0.005           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.90      20  sample
             0.005           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.95      20  sample
             0.005           ms/op
MatrixMultiplicationBenchmark.
```

```
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.99      20  sample
             0.006           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.999     20  sample
             0.015           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.9999    20  sample
             0.077           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p1.00      20  sample
             0.155           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking
                                           50  sample
  103416     0.048 ±  0.001  ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.00      50  sample
             0.044           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.50      50  sample
             0.048           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.90      50  sample
             0.049           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.95      50  sample
             0.052           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.99      50  sample
             0.059           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
```

```
multiplyMatricesColumnBlocking·p0.999     50  sample
             0.063           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.9999    50  sample
             0.070           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p1.00      50  sample
             0.111           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking
                                         100  sample
   29909     0.335 ±  0.001  ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.00     100  sample
             0.309           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.50     100  sample
             0.332           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.90     100  sample
             0.344           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.95     100  sample
             0.350           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.99     100  sample
             0.372           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.999    100  sample
             0.421           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.9999   100  sample
```

```
              0.530           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p1.00     100  sample
              0.670           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking
                                          200  sample
    3828      2.622 ±  0.002  ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.00     200  sample
              2.585           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.50     200  sample
              2.613           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.90     200  sample
              2.658           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.95     200  sample
              2.687           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.99     200  sample
              2.757           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.999    200  sample
              3.115           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.9999   200  sample
              3.166           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p1.00     200  sample
              3.166           ms/op
```

```
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking
                                          500  sample
     261    38.675 ±  0.063  ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.00     500  sample
            38.339           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.50     500  sample
            38.535           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.90     500  sample
            39.191           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.95     500  sample
            39.387           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.99     500  sample
            39.609           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.999    500  sample
            40.239           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.9999   500  sample
            40.239           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p1.00     500  sample
            40.239           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking
                                         1000  sample
      40   308.530 ±  1.184  ms/op
MatrixMultiplicationBenchmark.
```

```
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.00    1000  sample
           306.708           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.50    1000  sample
           307.757           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.90    1000  sample
           311.899           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.95    1000  sample
           311.951           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.99    1000  sample
           315.621           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.999   1000  sample
           315.621           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.9999  1000  sample
           315.621           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p1.00    1000  sample
           315.621           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking
                                         1500  sample
      10  1082.340 ±  2.339  ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.00    1500  sample
          1080.033           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
```

```
multiplyMatricesColumnBlocking·p0.50    1500  sample
          1082.130           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.90    1500  sample
          1084.228           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.95    1500  sample
          1084.228           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.99    1500  sample
          1084.228           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.999   1500  sample
          1084.228           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.9999  1500  sample
          1084.228           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p1.00    1500  sample
          1084.228           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking
                                         2000  sample
      10  2485.964 ±  5.221  ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.00    2000  sample
          2478.834           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.50    2000  sample
          2487.222           ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.90    2000  sample
```

```
          2490.997          ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.95    2000  sample
          2491.417          ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.99    2000  sample
          2491.417          ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.999   2000  sample
          2491.417          ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p0.9999  2000  sample
          2491.417          ms/op
MatrixMultiplicationBenchmark.
multiplyMatricesColumnBlocking:
multiplyMatricesColumnBlocking·p1.00    2000  sample
          2491.417          ms/op

Process finished with exit code 0
```