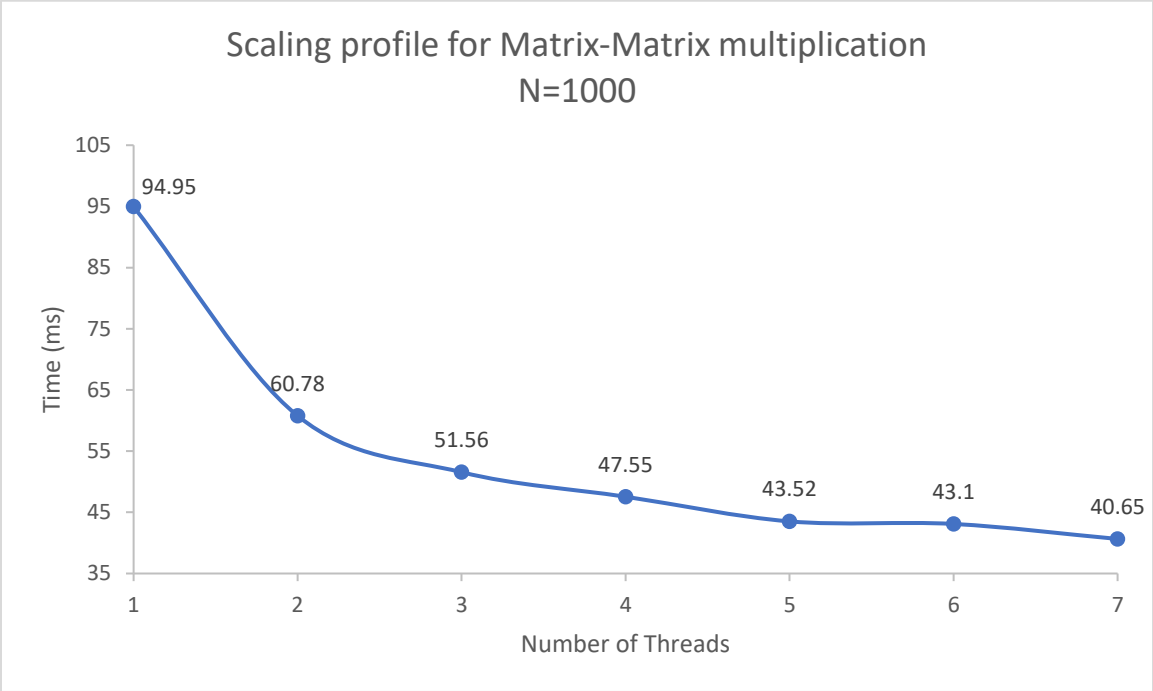
The entries in both matrices are random numbers between 1 and 9 with the following restrictions which provide a symmetric, positive definite matrix.

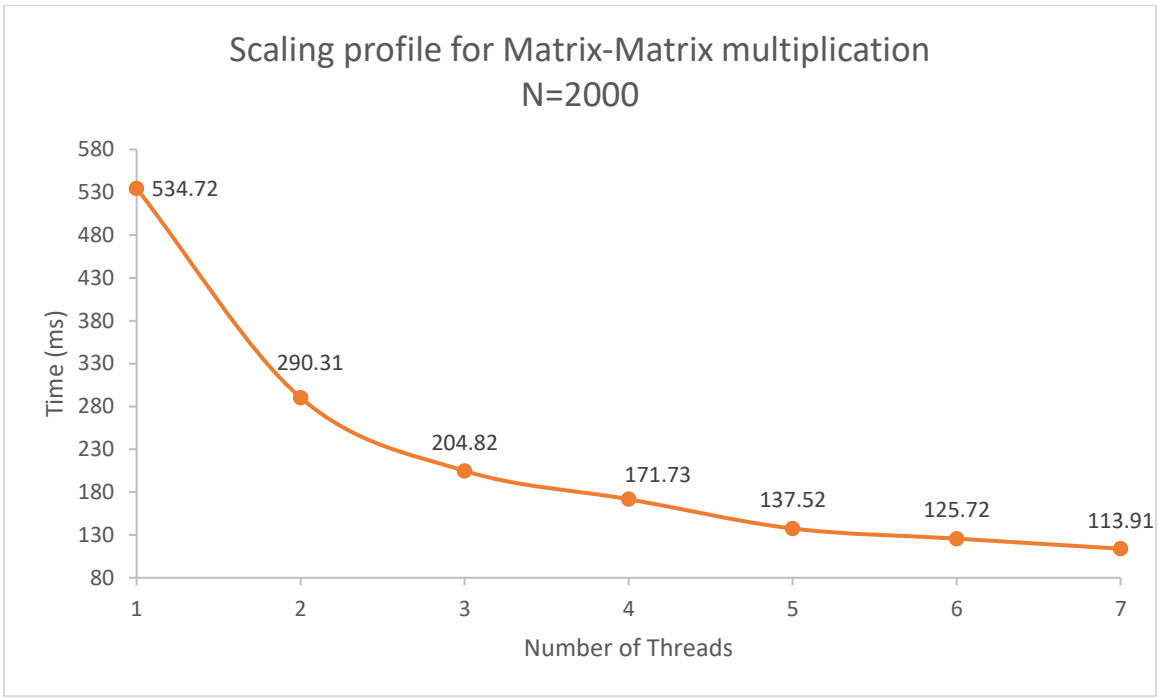
1. The off-diagonal entries are negative and symmetric.

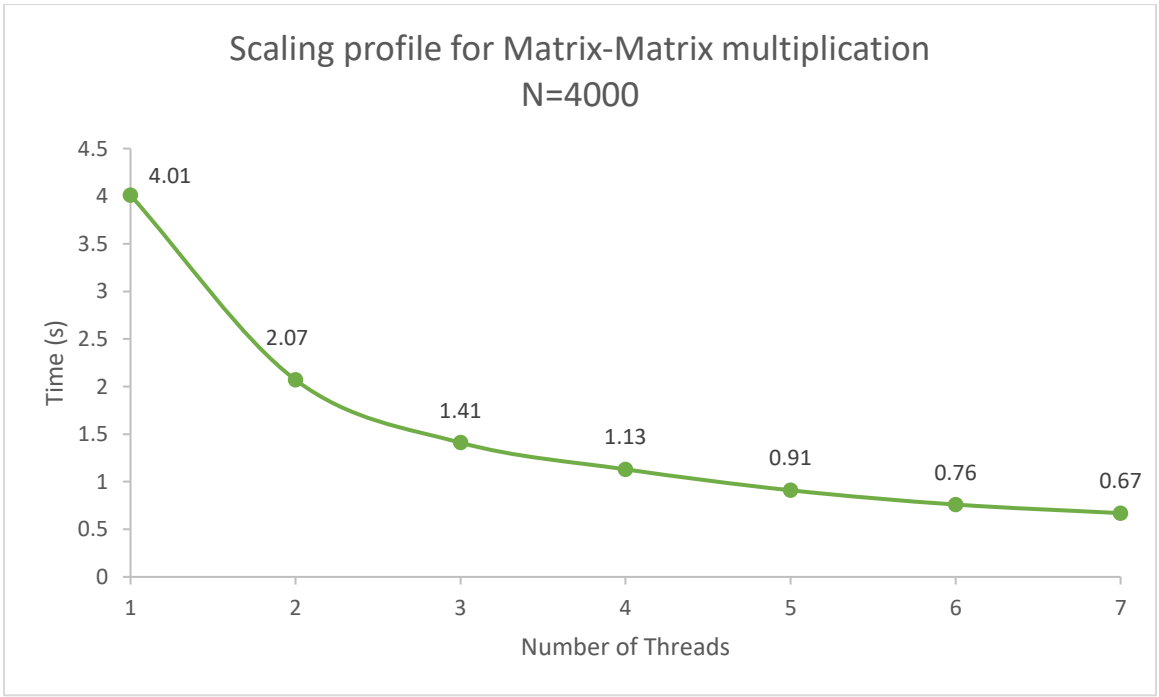
2. The diagonal entries are the absolute value of the row sums.

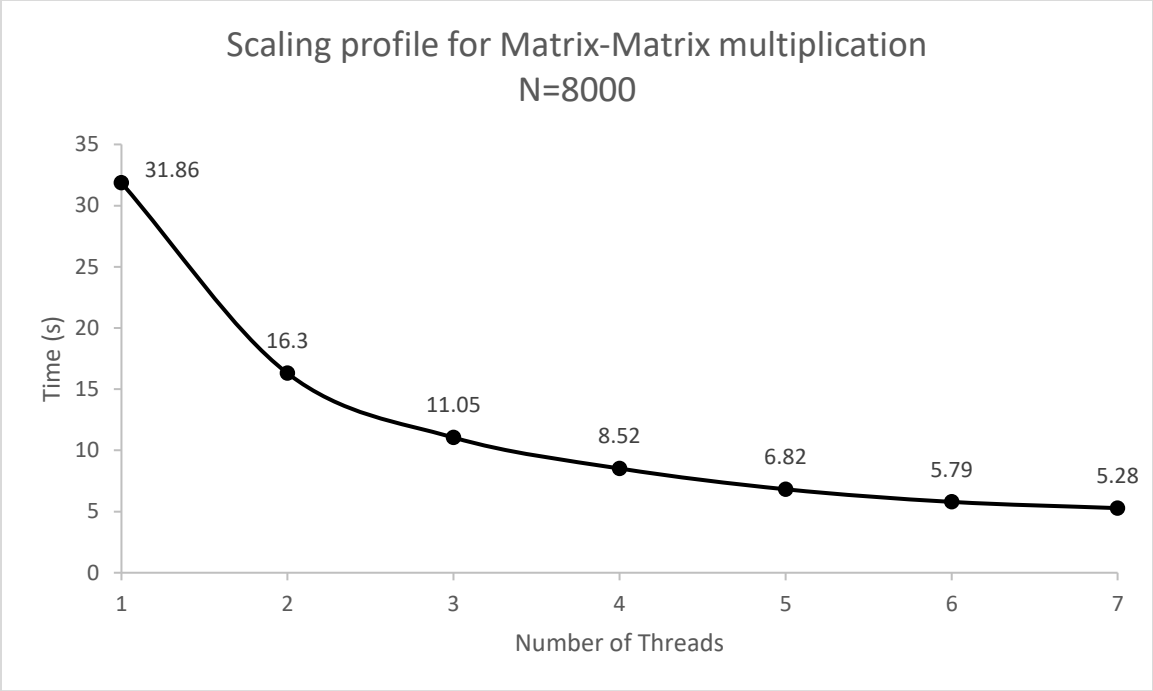
The Intel® Math Kernel Library for Matrix Multiplication [1] is applied to speed up calculations, then, timing function would record the calculation time at parallel zone. To compile the code, you need ICC compiler.

Scaling profile using different thread numbers and matrix sizes are represented in Figures below:




Scaling profile for Matrix-Matrix multiplication
N=2000
Time (ms)
580
530
480
430
380
330
280
230
180
130
80
534.72
290.31
204.82
171.73
137.52
125.72
113.91
1
2
3
4
5
6
7
Number of Threads


Scaling profile for Matrix-Matrix multiplication
N=4000
Time (s)
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
4.01
2.07
1.41
1.13
0.91
0.76
0.67
1
2
3
4
5
6
7
Number of Threads



[1] https://www.intel.com/content/www/us/en/develop/documentation/mkl-tutorial-c/top/multiplying-matrices-using-dgemm.html