COMP2006 Computer Organization

Cache and Multicore Optimization Exercise Worksheet

# Exercise

Run the **dgemm\_dt** program repeatedly with the matrices of different sizes and write down the results in the worksheet.

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| Matrix size  Version | 512 x 512 | 768 x 768 | 1024 x 1024 | 1536 x 1536 | 2048 x 2048 |
| Basic | 0.516174 | 1.439256 | 8.664155 | 33.992081 | 145.058090 |
| AVX only | 0.269835 | 0.741949 | 3.386049 | 15.886986 | 52.738091 |
| AVX with unrolling | 0.130571 | 0.389411 | 1.601933 | 7.094374 | 22.814245 |
| AVX with unrolling and cache optimization | 0.129142 | 0.355640 | 0.844316 | 3.557033 | 7.3354419 |
| AVX with unrolling, cache optimization and multithreading | 0.027356 | 0.107553 | 0.219250 | 0.772331 | 1.852206 |