

Lab 5 Report

Alec Williams

Original code	-O0	-O1	-O2	-O3
Runtime	203.44	156.86	156.98	157.07
Cache Misses	1,083,732,443	1,079,094,206	1,078,908,907	1,079,861,635
Cache References	22,648,493,600	3263383862	3261130236	3,260,333,165
With best compiler optimization level	Original	Column-major	Tiled 16x16	Tiled 32x32
Runtime	201.44156.83	12.88	22.255	20.1863
Cache Misses	1,079,036,510	3,437,323	152,314,266	118,051,419
Cache References	3,260,237,939	3,260,126,040	4,252,857,411	3,331,757,257

Explanation: The runtime appears to be strongly correlated the number of cache misses, where as cache references is more correlated with the compilers optimization level. Column major at -O3 optimization level had the best performance for me in regards runtime and cache misses. I believe my tiling implementation was done incorrect as I would expect the additional locality to significantly reduce cache misses and runtime.