OpenMP Performance

DMM and Knapsack

Performance Results

Dense Matrix Multiplication (N=M=L=256)

Metric	Time (seconds)
Sequential DMM Time	0.021019 s
Parallel DMM Time (OpenMP)	0.005464 s
Speedup	**3.85x**

Table 1: DMM Performance (256x256)

Discussion: Parallelizing the outer loop for DMM was effective, yielding a speedup of 3.85x on 8 threads. This is expected as row calculations are independent.

Pseudo-Polynomial Knapsack (N=1024, C=1024)

Metric	Time (seconds)
Sequential Knapsack Time	0.000970 s
Parallel Knapsack Time (OpenMP)	0.034711 s
Speedup	**0.03x (Slowdown)**

Table 2: Knapsack Performance (N=1024, C=1024)

Discussion: The parallel Knapsack showed a significant slowdown (0.03x speedup). The sequential version is extremely fast for these parameters. The overhead of OpenMP (thread management, ping-pong buffer copies for each of the 1024 items) likely outweighed the benefits of parallelizing the inner loop, which has minimal work per iteration.