

OpenMP Assignment

Sourabh Kulkarni, 532334

Yashas Bedre, 535744

Architecture and Programming Lab

TUHH

Details:

The submission folder consists of 3 versions of matrix LU decomposition: sequential (lud_seq), parallel (lud_par) and optimal (lud_opt).

Explanation:

Lud_par: **parallel pragmas** are used to create multiple threads for the for loop. Reduction variables “sum” are enclosed in a **parallel reduction pragma** so that the subtraction is optimized for all threads. **Private pragmas** are used which enclose the variables used in the for loops so that they are maintained in the threads’ private memory for faster access.

Lud_opt:

Results:

Note: All time results are averaged over a run of 10 times.

Matrix size – 256 x 256

Sequential	OpenMP		
Lud_seq (ms)	Number of threads	Lud_par (ms)	Lud_opt (ms)
8.99	5	12.30	8.51
	10	12.35	7.29
	15	14.04	4.63
	20	14.22	4.81
	26	12.66	5.02

Matrix size – 512 x 512

Sequential	OpenMP		
Lud_seq (ms)	Number of threads	Lud_par (ms)	Lud_opt (ms)
71.21	5	73.45	39.05
	10	73.21	25.24
	15	81.26	22.52
	20	82.81	19.21
	26	77.99	18.10

Matrix size – 1024 x 1024

Sequential	OpenMP		
Lud_seq (ms)	Number of threads	Lud_par (ms)	Lud_opt (ms)
660.09	5	531.02	264.01
	10	505.14	149.75
	15	519.46	169.34
	20	522.94	168.16
	26	554.62	137.00

Observations:



