*1. Programming using Threads*

**pThreads Lab**

Please choose one of the following tasks to complete for lab#5:

1. Parallel Matrix Arithmetic
2. Parallel Sudoku Solver
3. Parallel MergeSort

**Task 1 Overview - Parallel Matrix Arithematic**

Change to the matrix directory. You will find a file matrix.c and its’ corresponding MakefileMakefile. Using the template given in matrix.c write the functions to perform Parallel Matrix - Add, Subtract, and Multiply using pThreads. Your algorithm should work using 4 threads. (extra credit 2pts - if you can make it work for any given NxNNxN matrix.)[i.e. Given an NxNNxN matrix use NN threads].

**Task 2 Overview - Parallel Sudoku Solver**

Change to the sudoku directory. You will find a file sudoku.c and its’ corresponding MakefileMakefile. Using the template given in sudoku.c write the functions to perform Parallel Sudoku Solver to - CheckRow, CheckCol, CheckBox using pThreads. Your algorithm should work for at least a 9x9 matrix. (extra credit 2pts - if you can make work for larger boards.)

**Task 3 Overview - Parallel MergeSort**

Change to the mergesort directory. You will find a file ParallelMergeSort.c and its’ corresponding MakefileMakefile. Using the template given in ParallelMergeSort.c write the functions to divide the original array into equal fractions given the number of threads and perform Parallel MergeSort pThreads. Your algorithm should work for 2 threads. (extra credit 2pts - if you can make it work for up to N/3N/3 number of threads; where NN is the size of the input array.