Assignment #2

Due Date: November 9 , 2017

Total: 100 marks

Each program worth (50 marks – 10 marks for submission, comments, readme, makefile and demonstration using a text file that it works).

1. Write a multiprocess multi-threaded application for multiplying computing your CS 352 mark: one thread reads data, and another one computes the multiplication, using multiple threads. The third thread collects the result and displays it. You should use shared memory space within the main program to communicate between threads. Marking scheme:
   (a) creating the right number of threads: 10 marks each
   (b) creating the threads : 10 marks
   (c) computing the right result: 10 marks
   (d) overall program: 10 marks

2. Write a multi-threaded application to solve a Sudoku problem, on an $n^2 \times n^2$ grid (maximum 25x25). See more details in Project 1, page 197, from the textbook. Marking scheme:
   (a) creating the right number of threads: 10 marks
   (b) programming the threads : 10 marks
   (c) computing the right result: 10 marks
   (d) overall program: 10 marks

   Note:

   - You can try to use the following alphabets for
     (a) $n = 2$: $\{1, 2, 3, 4\}$
     (b) $n = 3$: $\{1, 2, 3, 4, 5, 6, 7, 8, 9\}$ – this is the classical version of the game.
     (c) $n = 4$: $\{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, a, b, c, d, e, f\}$ or $\{a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p\}$
     (d) $n = 5$ $\{a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y\}$
   - The n letters of the alphabet must occur only once in each
     – of the n^2 squares
     – line
     – column.

   Example

2	9	5	7	4	3	8	6	1
4	3	1	8	6	5	9	2	7
8	7	6	1	9	2	5	4	3
3	8	7	4	5	9	2	1	6
6	1	2	3	8	7	4	9	5
5	4	9	2	1	6	7	3	8
7	6	3	5	3	4	1	8	9
9	2	8	6	7	1	3	5	4
1	5	4	9	3	8	6	7	2