CS300: Programming Languages

Spring 2022

Lab Assignment #1

- Name only: _____
- Release date: Feb 01, 2022 (Tuesday), 12:30pm
- Due date: Feb 08, 2022 (Tuesday), 12:30pm
- Assignment should be SUBMITTED on Blackboard before Due Date. Other submission methods will NOT be accepted.
- LATE Submission will NOT Be Accepted on Blackboard since the submission link will be closed automatically after due date;
    - o Additional submission for missing answer will NOT Be Accepted.
- There will be NO re-submission if the student submitted the wrong assignment. So, please verify the uploaded assignment after the submission.
- It should be done INDIVIDUALLY;
- Total: 10 pts

1. In computing, row-major order (C/C++, etc) and column-major order (Fortran, etc) are methods for storing multidimensional arrays in linear storage such as random access memory. The difference between the orders lies in which elements of an array are contiguous in memory. In row-major order, the consecutive elements of a row reside next to each other, whereas the same holds true for consecutive elements of a column in column-major order.

    How does the order we access the elements of a 2D array affects the program performance? In particular, does it make any difference to access the elements in row-major vs. column-major order?

Questions for the Lab

Your submission should be a zip file containing:
1. Source codes manipulating 2D arrays stored in both row-major and column-major order [7 pts]
2. WORD document contains the following:
    a. a screenshot of the measurements of program performance (e.g., running time or other performance metrics) [1 pt]
    b. explanation why there is differences in the programs' performance. [2 pts]