CS3383, Winter 2019, Final Preparation
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Referring to the CS3383 calendar, the midterm will be held in class, Feb/25/2019.

Notes:

(A) The final exam has been scheduled by the registrar for April 27, 2019 at 9AM in the Curry Center, performance gym, rows 7-9.

(B) Plan to arrive around 20 minutes early.

(C) The exam is closed book, and 3 hours long. The exam is worth 50% of your final mark. As per the the syllabus, you must get 50% of the final, and get 55% overall in oreder to get more than a D in the course.

(D) All materials already on D2L including Lecture Slides, Notes, Assignments, Exercises, and the examples in the Textbook are supposed to be studied for the final.

(E) In addition to the materials mentioned in (D) and sample questions posted for midterm, you are encouraged to see some sample questions posted on Dr. Bremner's algorithm page:
http://www.cs.unb.ca/~bremner/teaching/cs3383/tests/t1
http://www.cs.unb.ca/~bremner/teaching/cs3383/tests/t2.

The topics that we covered in this course are as follows.

1. Analysis Techniques

   - Asymptotics analysis, Big-O, Big-Omega, Big-Theta
   - Geometric series, Indicator variables, Recurrences, Master Theorem, Recursion Trees, Substitutions, Telescoping, Memoization Analysis,...

2. Design Techniques

   - Divide & Conquer
     - Integer Multiplication, (Randomized) Median finding, Matrix Multiplication, Merge Sort, ...
   - Greedy
     - Local Improvement, MST, Cut Property, Prim's Algorithm, Kruskal Algorithm, Huffman Tree,...
   - Backtracking
     - Where can be applied, Test framework, SAT, N-Queens,Sudoku, Rubik's Cube, Subset Sum,...
     - Verification Algorithms
   - Dynamic Programming
     - DAG Model, Topological Sort, Shortest/Longest path, LIS, LCS, Edit Distance, Knapsack, Matrix chain Multiplication,...

3. Multithreaded Algorithms

- Primitives
    - Spawn, Sync, Parallel for, Implementation of Parallel for with Spawn
- DAG Model
    - work, span, parallelism, speed-up,...
- Examples
    - Fibinacci, Matrix-Vector Multiplications, Matrix Multiplications, Knapsack, race conditions,...

Here at: http://www.cs.unb.ca/~bremner/teaching/cs3383/tests/t4/, you can find sample final exam questions from the previous years. **Exclusion:** please be advised that you don't need to review the questions posted under titles: **Union Find** and **Recursive example II: Loopy**.

Question:

a) Design your SUCCESS algorithm!

b) Prove that your algorithm in (a) is correct!

c) Analyze your algorithm in (a), and compute its complexity!

Best of luck!