CPSC 3620 Project

This is a team based project. Teams (of 2) have been created on Moodle. Please submit the code, and the report as one zipped/tar file. Demos will be held online. Try to submit as early as possible. The code & the report are due before the last day of classes, [2021-04-12]

The project is to program one of the following data structures. Research the data structure and implement it from first principles, do not use library implementations. Please do not borrow code from others. You may use C/C++/Python/Haskell/Go or your favorite programming language.

There is team work as well independent learning in this project.

- Red black tree
- Treap
- kd-tree
- Finger trees
- PQ tree
- Suffix tree
- Cuckoo Hashing
- Trie
- AVL Tree

Conduct experiments to evaluate the performance of the implementation, i.e, perform a sequence of random operations on the data structure. Measure the statistics for each operation. The statistics of interest are the time taken, and the memory usage. Evaluate the performance on multiple sequences of operations.

Write a five part report that i) describes the data structure and its operations ii) establish the correctness of the operations and the worst-case or the amortized running time iii) describe the experiments and the results, iv) what conclusions can you draw from the experiments v) how do the experimental results compare to the the theoretical bounds on the running time. The report should be 4-5 pages long, single spaced with reasonable margins. Cite all your sources.