Persistent Data Structures

Assignment #4 for E0 251
Due date : 10-Nov-2019, 11.59 PM

Part 1:

You are required to implement a small library of persistent data structures in C. Your library must support both *partially* and *fully persistent versions* of all the data structures. The library must include the following data structures and all the usual operations on them.

1. Heterogeneous vector (supports elements of different types) and map.
2. Stack, queue and double-ended queue.
3. Singly, doubly, and circularly linked linked list.
4. Normal binary search tree and red-black tree.
5. Any other non-trivial persistent data structure will fetch bonus marks.

Part 2:

You are required to choose an application (or more than one) to demonstrate the above data structures. Each of you must choose a different application (or applications) and your choice must be approved by YNS. The applications may be chosen as late as you wish. The list of all the applications chosen till that date along with its description will be published in a Googledoc document whose link will be sent to you.

To get your application approved, you must send a half page description of the application by email to YNS. The credit will vary depending on the amount of work needed to implement the application. Excellent applications will fetch bonus marks.

Bonus marks for both Part 1 and Part 2 inclusive will be limited to 25% of the total marks for this assignment. So, do not try to overdo this assignment!

References

Three documents are attached. The language *Clojure* supports persistent data structures (runs over JVM). All the well known functional programming languages have persistent data structures by default.