

Project #5.

Comparative analysis of Data Structures

In this project, you will implement different versions of advanced data structures for search and retrieval, and compare their performance on benchmark data sets. These will include several data structures beyond what we discussed in class. Examples of comparable structures are:

- . a) Van Emde Boas trees, x-Fast tries, y-Fast tries for ordered dictionaries that support $\text{insert}(x)$, $\text{lookup}(x)$, (which returns whether $x \in S$), $\text{delete}(x)$, which removes x from S . $\text{max}()$ / $\text{min}()$, $\text{successor}(x)$, (which returns the smallest element of S greater than x), and $\text{predecessor}(x)$, (which returns the largest element of S smaller than x .)
- . b) K-d trees and locality sensitive hashing for solving the nearest neighbor problem for multidimensional data.

Alternatively, you may suggest some data structures of interest, as well as the relevant comparisons. We will develop appropriate input files based on the problem you specify.

Minimum Requirements [55%]

- Command line user interface that lets user input queries as well as select appropriate structure for response.
- Command line interface to see response for queries.

Possible Extensions [15%]

- Develop a GUI [15%]

Comparative Features [30%]

- Speed of key operations