Generalised Data Structures Library

Technology: C++ Programming

Project Overview

This project is a **C++ library of generic data structures** that provides **object-oriented implementations** of both **linear and non-linear data structures**.

It offers **ready-to-use functionalities** for fundamental as well as advanced operations, designed in a **generic way** using templates so that they can be reused with **any data type**.

The library is designed to support **clean OOP principles, modularity, and extensibility**—making it suitable for both academic learning and real-world application development.

Key Features

- **Linear Data Structures**
  - Singly Linear Linked List
  - Singly Circular Linked List
  - Doubly Linear Linked List
  - Doubly Circular Linked List
  - Stack (LIFO)
  - Queue (FIFO)
- **Non-Linear Data Structures**
  - Binary Search Tree (BST) with insert, delete, traversal operations
- **Algorithms**
  - Searching (Linear Search, Binary Search etc)
  - Sorting (Bubble Sort, Selection Sort, Insertion Sort etc)
- **Generic Implementation**
  - Uses **C++ templates** for data type independence.
  - Same implementation works for integers, floats, strings, and custom objects.
- **Library Format**
  - Designed as a reusable **C++ library** that can be linked with client applications.

Learning Outcomes :

- Mastery of **C++ Object-Oriented Programming (OOP) principles**.
- Strong foundation in **linear and non-linear data structures**.
- Implementation of **generic programming with templates**.
- Practical knowledge of **searching and sorting algorithms**.
- Experience in designing **reusable libraries** for software development.

GitHub Repository

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