**CPlusPlus-Laboratory**

Welcome to the **CPlusPlus-Laboratory** repository! This repository is a reflection of my journey in C++ programming, showcasing the core concepts of **Object-Oriented Programming (OOP)** and **Data Structures and Algorithms (DSA)**. It’s structured to help students, developers, and anyone interested in learning C++ by providing clean, maintainable, and scalable code that’s well-organized and properly commented.

**📁 Directory Structure**

The repository is organized into two main directories:

**1. Object-Oriented Programming (OOP)**

This directory contains concepts and practical implementations of OOP principles in C++:

* **1.1 Vectors**:
  + A basic introduction to vectors, showcasing their usage. This directory currently contains a single file and will be updated with more content in the future.
* **1.2 Polymorphism**:
  + A detailed implementation of **operator overloading**, focusing on complex numbers. It provides a practical example that developers and learners can refer to for mastering common operator overloading techniques.

**2. Data Structures and Algorithms (DSA)**

This directory contains implementations of foundational data structures and algorithms:

* **1.1 Recursion**:
  + Code files based on recursion concepts, with a subdirectory containing **lab work** and **programming exercises** from the book *"C++ Programming by D.S. Malik"*, aimed at solidifying your understanding of recursion.
* **1.2 Linked Lists**:
  + A set of problems and solutions focused on **linked lists**. It includes a subdirectory with exercises from the same book as the recursion section.
* **1.3 Stacks & Queues (WIP)**:
  + Work in progress. This section will include solutions for stack-based problems, followed by the exploration of **queues** in C++.

The topics are organized **numerically** for easy navigation and reference.

**💻 Usage Instructions**

To use any of the code in this repository:

1. **Clone the repository**: git clone https://github.com/YourUsername/CPlusPlus-Laboratory.git
2. **Navigate** to the relevant directory (OOP or DSA).
3. **Compile** the C++ files using your preferred compiler, e.g., g++: g++ filename.cpp -o outputfile

./outputfile

Feel free to modify the code to suit your needs!

**🛠️ Code Quality**

The code in this repository is written with a focus on:

* **Clean, maintainable, and scalable structure**.
* **Clear and concise comments** to explain logic and implementation.
* Proper **organization** for easier understanding and future modifications.

You can freely use and integrate these classes and functions in your own projects.

**📅 Future Updates**

I plan to regularly update this repository by:

* Adding more **lab work** and **projects**.
* Improving the existing codebase to provide further value to the development community.
* Enhancing documentation and adding more example-based tutorials.

**📝 Contributions**

Contributions are welcome! If you find any issues or have suggestions for improvement, feel free to open an issue or submit a pull request.

**Contribution Guidelines:**

1. Follow the existing **code style** and **naming conventions**.
2. Comment on your code where necessary to improve readability.
3. Ensure all changes are tested before submission.

**📜 License**

This repository is open-sourced under the **MIT License**. Feel free to use the code, but please attribute it back to this repository when sharing.

**👨‍💻 About the Author**

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Thank you for visiting this repository! Stay tuned for more updates and contributions to the C++ development community!