

Book Management System Using Stack (Array)

Introduction

This project implements a **Book Management System** using the **Stack data structure**. The system simulates stacking books on a table where the **Last In, First Out (LIFO)** principle is applied. The system allows a librarian to undo actions by removing the most recently added book.

Objective

The main objective of this program is to:

- Manage books using a stack implemented with an array
- Allow the user to manually enter book data
- Perform stack operations efficiently
- Demonstrate practical application of stacks in real-world scenarios

Data Structure Used

Stack

- The stack stores book names as strings
- Fixed maximum size
- Uses an integer top to track the current position

Operations Implemented

1. Push

Adds a new book to the top of the stack

2. Pop

Removes the top book from the stack

3. Peek

Displays the most recently added book

4. Display

Shows all books from top to bottom

5. Is Empty

Checks whether the stack has any books

Overview

Initialize stack with top = -1

User selects operation from menu

Stack operations are performed based on user input

Program continues until user selects Exit

Test Cases

	Operation	Input	Expected Output
1	Push	"C++ Programming"	Book added successfully
2	Push	"Data Structures"	Book added

			successfully
3	Peek	—	Data Structures
4	Display	—	Data Structures, C++ Programming
5	Pop	—	Data Structures removed
6	Peek	—	C++ Programming
7	Is Empty	—	Stack is not empty
8	Pop	—	C++ Programming removed
9	Is Empty	—	Stack is empty

Conclusion

This project successfully demonstrates the implementation of a **stack using an array** to manage books in a library system. It fulfills all requirements, supports undo functionality, and applies core Data Structures and Algorithms concepts in a practical way.