

# PROJECT PRESENTATION

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# INTRODUCTION

The Bookshop Management System is a software application designed to facilitate the management of book inventories and transactions in a bookshop. The system allows bookshop owners and staff to manage their inventory, modify book details, handle customer purchases, and search for specific books efficiently. This project demonstrates the application of object-oriented programming (OOP) principles to build a structured and robust system using C++.

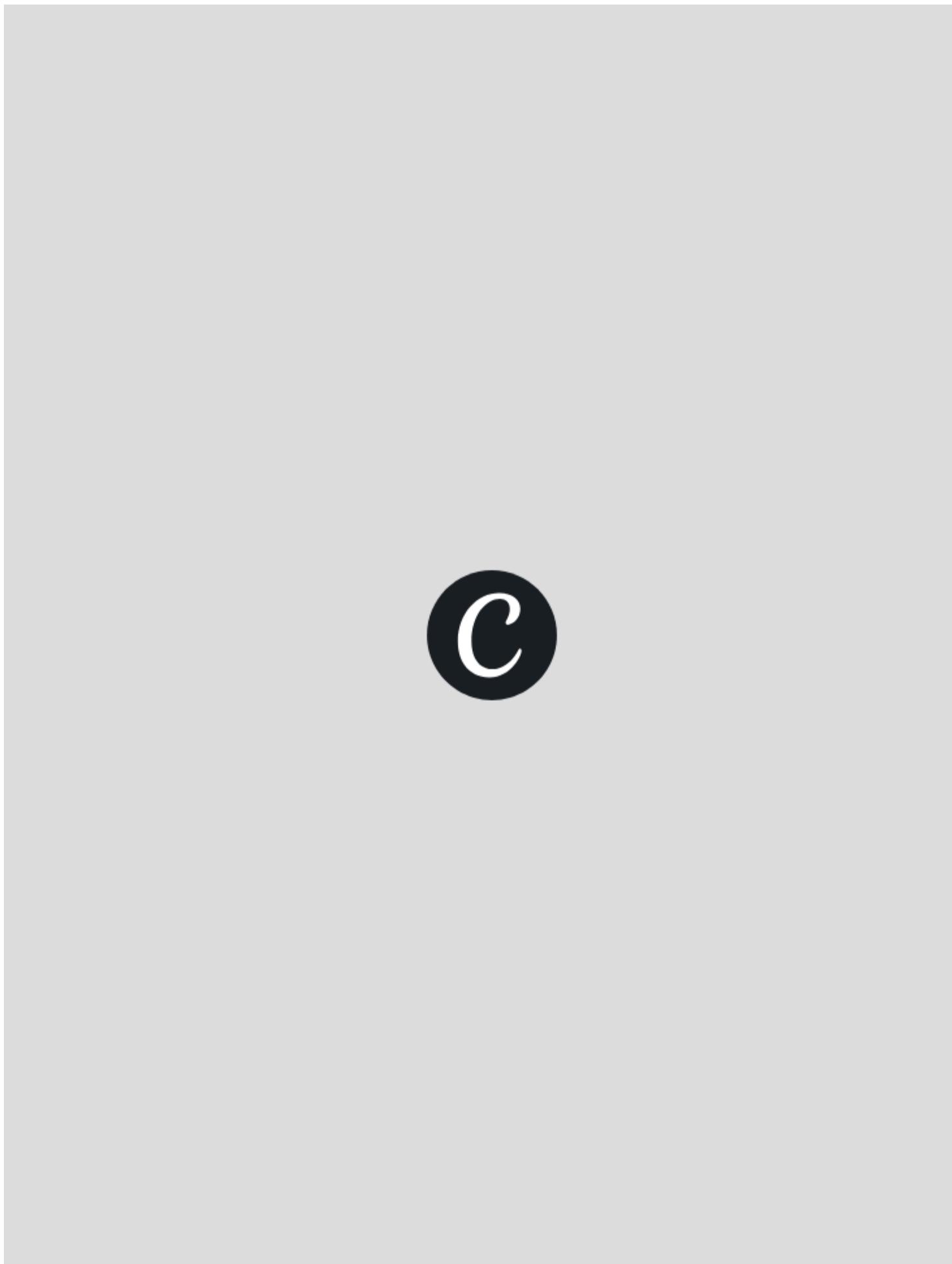
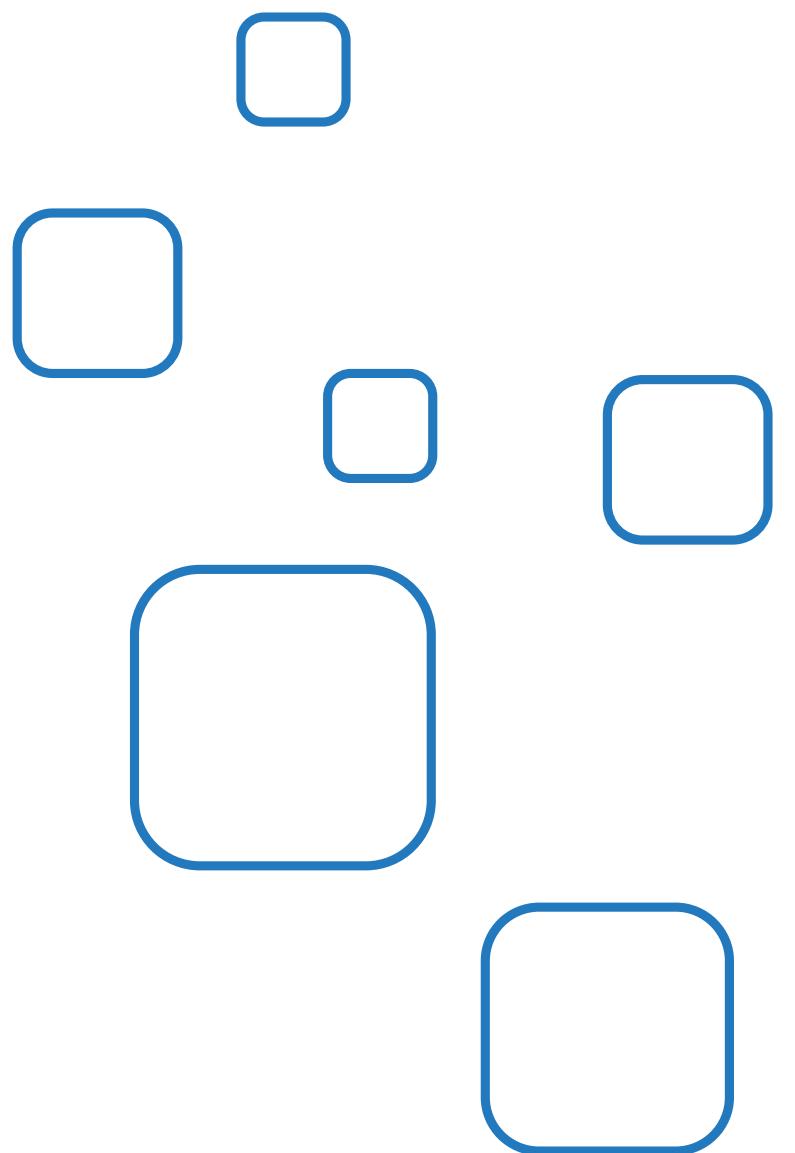
## PROBLEM DESCRIPTION

Design and implementing an efficient cpp program to create a comprehensive bookshop management system. The system should support the functionalities of adding, modifying, deleting, displaying, and searching for books in the inventory. It should also handle customer purchases which book and ensure that the inventory is maintained in a sorted order by book ID for optimal data management.

# OBJECTIVES

- Efficient Book Management: Creating a system that allows for adding, displaying, modifying, deleting, and searching books within a bookstore's inventory.
- Customer Interaction: Implementing features to facilitate customer interactions, such as purchasing books and capturing customer details.
- Data Organization: Using a map to store books sorted by bookId to ensure quick access and an ordered display.
- OOP Concepts: Demonstrates object-oriented programming principles, including classes, objects, and encapsulation, to structure the program effectively.

**CODE**



# OUTPUT

Menu:

1. Add Book
2. Display All Books
3. Modify Book
4. Delete Book
5. Search Book
6. Buy Book
7. Exit

Enter your choice: 1

Enter Book ID: 01

Enter Title: Bridge to Terabithia

Enter Author: Katherine Paterson

Enter Genre: Fantasy

Book added successfully!

Menu:

1. Add Book
2. Display All Books
3. Modify Book
4. Delete Book
5. Search Book
6. Buy Book
7. Exit

Enter your choice: 1

Enter Book ID: 02

Enter Title: A Vow of Hate

Enter Author: Lylah James

Enter Genre: Fiction

Book added successfully!

Menu:

1. Add Book
2. Display All Books
3. Modify Book
4. Delete Book
5. Search Book
6. Buy Book
7. Exit

Enter your choice: 1

Enter Book ID: 03

Enter Title: A Little Life

Enter Author: Hanya

Yanagihara

Enter Genre: Novel

Book added successfully!

Menu:

1. Add Book
2. Display All Books
3. Modify Book
4. Delete Book
5. Search Book
6. Buy Book
7. Exit

Enter your choice: 2

Book Inventory:

Book ID: 1

Title: Bridge to Terabithia

Author: Katherine Paterson

Genre: Fantasy

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Book ID: 2

Title: A Vow of Hate

Author: Lylah James

Genre: Fiction

---

Book ID: 3

Title: A Little Life

Author: Hanya Yanagihara

Genre: Novel

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Menu:

1. Add Book
2. Display All Books
3. Modify Book
4. Delete Book
5. Search Book
6. Buy Book
7. Exit

Enter your choice: 3

Enter Book ID to modify: 04

Modify Book ID 4:

Enter New Title: The Fault in Our Stars

Enter New Author: John Green

Enter New Genre: Fantasy

Book modified successfully!

Menu:

- 1. Add Book
- 2. Display All Books
- 3. Modify Book
- 4. Delete Book
- 5. Search Book
- 6. Buy Book
- 7. Exit

Enter your choice: 4

Enter Book ID to delete: 04

Book with ID 4 deleted successfully!

Menu:

- 1. Add Book
- 2. Display All Books
- 3. Modify Book
- 4. Delete Book
- 5. Search Book
- 6. Buy Book
- 7. Exit

Enter your choice: 5

Enter Book ID to search: 03

Book found:

Book ID: 3

Title: A Little Life

Author: Hanya Yanagihara

Genre: Novel

Menu:

- 1. Add Book
- 2. Display All Books
- 3. Modify Book
- 4. Delete Book
- 5. Search Book
- 6. Buy Book
- 7. Exit

Enter your choice: 6

Enter Book ID to buy: 02

Enter customer name: geeta

Enter contact number: 84934888484

Transaction Details:

Book ID: 2

Title: A Vow of Hate

Author: Lylah James

Genre: Fiction

Customer Name: Riotedawg

Contact Number: 84934888484

Menu:

- 1. Add Book
- 2. Display All Books
- 3. Modify Book
- 4. Delete Book
- 5. Search Book
- 6. Buy Book
- 7. Exit

Enter your choice: 7

Exiting the Bookshop

Management System.

Thank you!

# OUTCOMES

- The program supports adding, displaying, modifying, deleting, and searching books, as well as handling book purchases with customer details, all while ensuring books are stored and displayed in a sorted manner based on `bookId`. This results in an organized and efficient inventory management system that simulates real-world bookstore functionalities.
- Practical Application of OOP: Provides a hands-on example of object-oriented programming concepts such as encapsulation, demonstrating how data and functions are organized within classes.

# COMPLEXITY

## TIME COMPLEXITY

- Adding a Book:  $O(\log n)$
- Displaying All Books:  $O(n)$
- Modifying a Book:  $O(\log n) + O(l) = O(\log n)$ .
- Deleting a Book:  $O(\log n)$ .
- Searching for a Book:  $O(\log n)$ .
- Buying a Book:  $O(\log n) + O(l) = O(\log n)$ .

### Conclusion

- The most frequent operations such as insertion, deletion, and search have a time complexity of  $O(\log n)$ .
- Displaying all books has a time complexity of  $O(n)$ .
- TOTAL time complexity=  $O(n)$ .

## SPACE COMPLEXITY

### Book Data Storage:

- The map container holds all book objects. The space complexity for storing  $n$  books is  $O(n)$ .

### Customer Data:

- The space for customer data is minimal and does not scale with the number of books, so it is  $O(l)$  for each transaction.

### Conclusion

- The space complexity for storing all books is  $O(n)$  due to the map container.

## CONCLUSION

The Bookshop Management System effectively demonstrates core object-oriented programming concepts and data structure usage for real-world application. By utilizing classes, maps, and key OOP principles such as encapsulation and data abstraction, this program provides a robust solution for managing bookstore operations. It showcases how data can be organized, retrieved, and modified efficiently, offering a functional simulation of a bookstore management application. This project emphasizes the importance of structured data management and showcases how to implement user-friendly interactions for maintaining inventory and processing transactions.

**THANK YOU**