Task: Build a Simple Library Management System using OOP Concepts

Objective:

To help you understand and implement the core principles of Object-Oriented Programming (OOP) such as Class, Object, Inheritance, Encapsulation, Abstraction, and Polymorphism through a real-world project - a basic Library Management System.

Project Description (Rephrased for Freshers):

You are assigned to create a basic Library Management System that can perform simple operations such as:

- Adding new books

- Issuing books to members

- Returning books

- Viewing book availability

- Managing members (add/remove/view)

This system will simulate how a library operates, using classes and objects to represent books, users, and library operations.

What You Need to Implement:

1. Class Structure (Use OOP Concepts)

- Book class - with properties like book_id, title, author, available_copies

- Member class - with properties like member_id, name, borrowed_books

- Library class - to manage books and members using methods like:

- add_book()

- issue_book()

- return_book()

- view_books()

- add_member()

- remove_member()

2. Basic Operations (As Methods):

- Store and display book details

- Keep track of issued/returned books

- Maintain member records

- Prevent issuing a book if no copies are available

Expected Concepts to Use:

- Classes and Objects

- Inheritance (optional: if you want to create sub-classes for different user roles)

- Encapsulation (use of private/protected attributes with getter/setter)

- Abstraction (hide internal logic through methods)

- Polymorphism (optional: method overriding if using inheritance)

Output Format:

- Simple console-based interface (no need for GUI)

- Input and output via terminal/command-line

- Use of proper prompts and validations

Timeline:

- Suggested Time to Complete: 2-3 days

- Submission Format: .py or .java file with comments explaining your code

Bonus (Optional for Enthusiasts):

- Store data in files (text or CSV)

- Use exception handling for invalid inputs

- Add feature to search a book by title or author