Project – 01

Upload the answer in the GitHub repository. Submit only the GitHub link as a text file.

You have been assigned to develop a Library Management System for a public library. Design and implement the necessary classes to support the system using the concepts of class, objects, abstraction, inheritance, encapsulation, and polymorphism. Your implementation should include the following classes:

1. **LibraryItem** (abstract class)

    - Properties:

        - **title** (String): the title of the library item.

        - **itemID** (String): a unique identifier for the library item.

    - Methods:

        - **checkOut()**: marks the library item as checked out.

        - **checkIn()**: marks the library item as checked in.

        - **displayItemDetails()**: displays the details of the library item.

2. **Book** (subclass of **LibraryItem**)

    - Additional Properties:

        - **author** (String): the author of the book.

        - **numPages** (int): the number of pages in the book.

3. **Magazine** (subclass of **LibraryItem**)

    - Additional Properties:

        - **issueDate** (String): the issue date of the magazine.

        - **publisher** (String): the publisher of the magazine.

4. **LibraryMember**

    - Properties:

        - **memberID** (String): a unique identifier for the library member.

        - **name** (String): the name of the library member.

    - Methods:

        - **displayMemberDetails()**: displays the details of the library member.

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Implement the above classes and write the necessary code to demonstrate the following functionality:

1. Create 5 objects of the **Book** class, each representing a different book in the library.

2. Create 5 objects of the **Magazine** class, each representing a different magazine in the library.

3. Create 5 objects of the **LibraryMember** class, each representing a different member of the library.

4. Set the properties of the objects using appropriate setter methods.

5. Call the **checkOut()** and **checkIn()** methods on one of the library items.

6. Display the details of all the library items and library members.

Books:

Title	Item ID	Author	Number of Pages
The Catcher in the Rye	B001	J.D. Salinger	240
To Kill a Mockingbird	B002	Harper Lee	281
1984	B003	George Orwell	328
Pride and Prejudice	B004	Jane Austen	432
The Hobbit	B005	J.R.R. Tolkien	320

Magazines:

Title	Item ID	Issue Date	Publisher
National Geographic	M001	August 2023	National Geographic Society
Time	M002	September 2023	Time USA, LLC
Forbes	M003	June 2023	Forbes Media
Vogue	M004	July 2023	Condé Nast
Sports Illustrated	M005	July 2023	Maven Coalition

Library Members:

Member ID	Name
L001	John Doe
L002	Jane Smith
L003	David Johnson
L004	Sarah Williams
L005	Michael Brown