ROBOTICS CORNER

Task(11.2)

Instructions:

Abstract Class: LibraryItem

- This is the base class representing a generic library item. It defines the following pure virtual methods, which must be implemented by derived classes:
    - displayInfo(): Outputs details about the library item.
    - isAvailable(): Returns a boolean indicating whether the item is available for borrowing.
    - borrowItem(): Handles the logic for borrowing the item.
    - returnItem(): Handles the logic for returning the item.
- A virtual destructor is provided to ensure proper cleanup of derived classes when they are deleted.

Derived Class: Book

- Inherits from LibraryItem and represents a book in the library.
- Private members include:
    - title: The title of the book.
    - author: The author of the book.
    - available: A boolean flag indicating if the book is available for borrowing.
- Implements the abstract methods:
    - displayInfo(): Prints the book's title, author, and availability status.
    - isAvailable(): Returns the availability status.
    - borrowItem(): Marks the book as borrowed if it is available; otherwise, it prints an error message.
    - returnItem(): Marks the book as available again and prints a confirmation message.

Derived Class: Magazine

- Similar to Book, it inherits from LibraryItem and represents a magazine in the library.
- Private members include:
    - title: The title of the magazine.
    - issueNumber: The issue number of the magazine.
    - available: A boolean flag indicating if the magazine is available for borrowing.
- Implements the same set of abstract methods as the Book class, tailored to magazine-specific attributes.

Main Function

- The main() function initializes the system:
    - A vector of pointers to LibraryItem objects is created to store different library items.
    - Instances of Book and Magazine are created and added to the vector.
    - Information about each item is displayed using the displayInfo() method.
    - The program demonstrates borrowing and returning functionality:
        - A user can borrow available items, and if an item is already borrowed, the system provides an appropriate message.
        - Items can be returned, updating their availability status.
- Finally, the dynamically allocated memory for the library items is cleaned up to prevent memory leaks.

Thank You