Digital Library Management System

CMPE 261

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30.11.2024

LibraryBook class

This class represent a book in the library with attributes of tithe,author,availability and ISBN and static attribute totalBooks

LibraryBook(): Constructor that initialize book attributes.

displayInfo(): Displays the attributes of book.

setAvailability(): Changes the available attribute of book.

isAvailable(): Returns available or not.

getISBN(): Returns ISBN.

getTitle(): Returns title.

getAuthor(): Returns author.

getTotalBooks(): Returns number of total books.

LibraryUser class

This class is abstract class that represent a library user, has attributes such as name and userID.

LibraryUser(): Constructor to initialize user.

~LibraryUser(): Destructor.

displayUserInfo(): Pure virtual function to display user info.

getName(): Returns name of user.

getID(): Returns ID of user.

Member class

Child class of LibraryUser class,it represents member of the library. Has private attributes for borrowed books in vector (type is LibraryBook* since it is dynamic and a book).

Member(): Constructor to initialize member.
borrowBook(): Allows member to borrow book that is available.(if its availavle pushes back book to the vector)

returnBook(): Allows member to return book that is not available. (sets availability true and then erases book from the vector)
displayUserInfo(): Displays member info.

Librarian class

Child class of LibraryUser class,it represents librarian of the library.

Libarian(): Constructor to initialize librarian.

addBook(): Allows librarian to add book to the library.(it pushes back the book object to the vector that is referenced in the library)

displayUserInfo(): Overwritten method to display librarian info.

LibrarySystem class

This class manages the entire library it has attributes of books and users as vector.

~LibrarySystem() : Destructor, it deletes the informations of vectors.

addUser(): It adds new user to the system (member,librarian).
searchBook(): It allows us to search arbitrary book in the library.
displayAllBooks(): It shows all book in the library system with using vector
displayAllUsers(): It shows all users from the library system with using vector.
getBooks(): It returns vector of books.

OUTPUTS

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Library System Initialized.
Adding new member: John Doe (ID: 101)
Adding new librarian: Sarah Smith (ID: 102)
Adding book: "1984" by George Orwell, ISBN: 9780451524935
Total books: 1
Adding book: "To Kill a Mockingbird" by Harper Lee, ISBN: 9780060935467
Total books: 2
Member John Doe is borrowing "1984".
Member John Doe returned "1984".
Displaying all books:
- Title: 1984, Author: George Orwell, ISBN: 9780451524935, Available: Yes
- Title: To Kill a Mockingbird, Author: Harper Lee, ISBN: 9780060935467, Available: Yes
Total books: 2
Displaying all users:
- Member: John Doe, ID: 101
- Librarian: Sarah Smith, ID: 102
```

Design Decisions

Among the STLs we saw in our CMPE 261 lessons, the one that best suited my logic was vectors. Because I did the same project with Arraylist last year and the API looked very similar. At the same time, it became easier for me to understand that the vectors are correct due to the CMPE 211 course this year.

Challenges and Solutions

The only challenging thing for me was the use of pointers. I understood them thoroughly by understanding the logic and reading the lecture notes. Other than that, things were easy because vectors were easier than using array lists if i compare with last year's java library project.