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Exercise 5 Task 9:

## 9. Design a Library Catalog System

### Step 1: Identify Library Items

Think about all the different types of items that library users can borrow from the library. Consider a variety of media and formats. List these items as part of your design process.

### Step 2: Design the Class Diagram

1. **Base Class**: Create a base class that represents a general library item. • **Attributes**: Identify common attributes that all library items share (e.g., title, author, publication year, item ID).

• **Methods**: Define methods that are common to all library items (e.g., displaying item information, borrowing an item, returning an item).

2. **Sub-Classes**: Create sub-classes for each specific type of library item you identified. • **Additional Attributes**: Identify attributes specific to each type of item.

• **Methods**: Define any additional methods specific to each type of item.

### Step 3: Define Basic Functions

Think about the basic functions needed for the library catalog to work properly:

• **Adding Items**: How will new items be added to the catalog?

• **Removing Items**: How will items be removed from the catalog?

• **Searching for Items**: How will users search for items in the catalog?

• **Borrowing Items**: How will users borrow items from the catalog?

• **Returning Items**: How will users return borrowed items to the catalog?

### Step 4: Draw a Sequence Diagram

Create a sequence diagram to illustrate interactions between the user and the catalog system. Consider at least a few interactions, such as:

1. **Borrowing an Item**: • User searches for an item.

• System displays search results.

• User selects an item to borrow.

• System checks item availability.
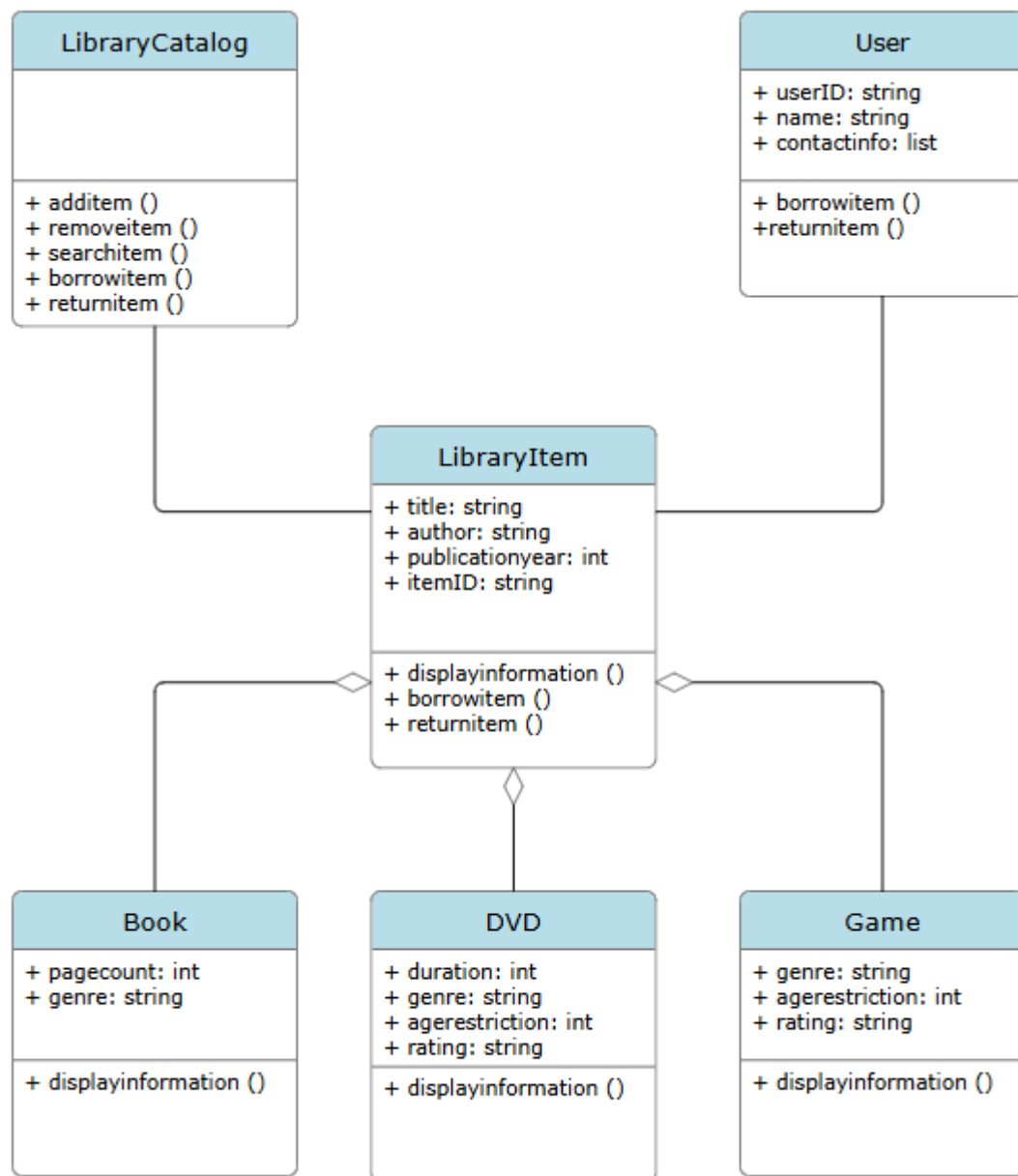
• System updates item status to borrowed.

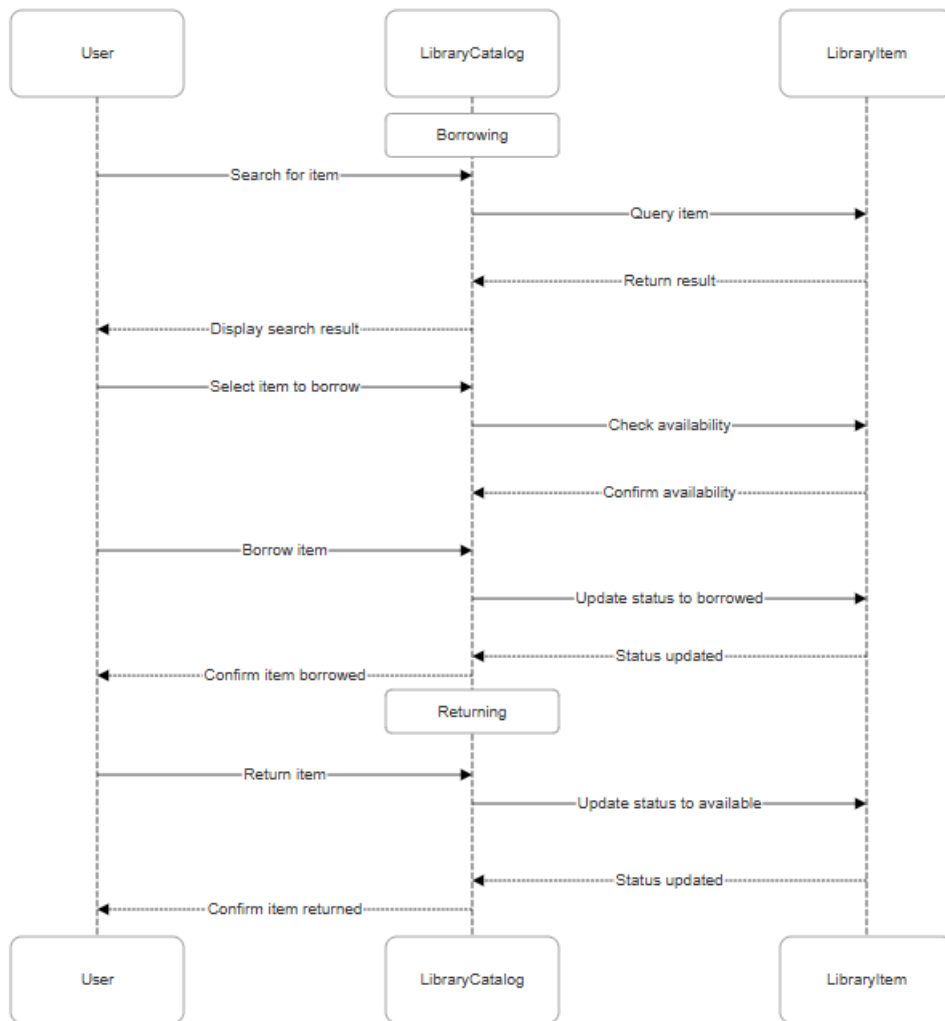2. **Returning an Item**: • User returns an item.

• System updates item status to available.

**Resources**

For more information on sequence diagrams, refer to this guide:

| LibraryCatalog |
| --- |
|  |
| + additem ()<br>+ removeitem ()<br>+ searchitem ()<br>+ borrowitem ()<br>+ returnitem () |

| User |
| --- |
| + userID: string<br>+ name: string<br>+ contactinfo: list |
| + borrowitem ()<br>+returnitem () |

| LibraryItem |
| --- |
| + title: string<br>+ author: string<br>+ publicationyear: int<br>+ itemID: string |
| + displayinformation ()<br>+ borrowitem ()<br>+ returnitem () |

| Book |
| --- |
| + pagecount: int<br>+ genre: string |
| + displayinformation () |

| DVD |
| --- |
| + duration: int<br>+ genre: string<br>+ agerestriction: int<br>+ rating: string |
| + displayinformation () |

| Game |
| --- |
| + genre: string<br>+ agerestriction: int<br>+ rating: string |
| + displayinformation () |

Näis käytetty tätä: https://www.smartdraw.com/