| Software design |
| --- |
| Library system |
| Version 2.0 |
| Prepared by class SE1825, Group 2  Nguyễn Bá Khánh HE170920  Nguyễn Minh Hoàng HE181094  Nguyễn Xuân Tùng HE176893  Phan Bảo Hoàng HE170958  July 10, 2021 |

**Contents**

[Revision history 4](#_gjdgxs)

[1. Document description 5](#_30j0zll)

[2. SRS overview 5](#_1fob9te)

[2.1. List of system users 5](#_3znysh7)

[2.2. List of use cases 5](#_2et92p0)

[2.3. Use case diagram 5](#_tyjcwt)

[2.3.1. Preliminary use case diagram 5](#_3dy6vkm)

[2.3.2. Use case detail diagrams 6](#_1t3h5sf)

[2.4. Activity diagrams of use case scenarios 7](#_4d34og8)

[2.4.1. Activity diagram for use case “Borrow Book” 7](#_2s8eyo1)

[2.4.2. Activity diagram for use case “Return Book” 8](#_17dp8vu)

[2.4.1. Activity diagram for use case “Reserve Book” 8](#_3rdcrjn)

[3. Data model 9](#_26in1rg)

[3.1.](#_lnxbz9) Entity Relationship Diagram 9

[3.2.](#_1ksv4uv) Table details/Chi tiết các bảng 9

[3.2.1.](#_44sinio) Table name: Borrower 9

[3.2.2.](#_2jxsxqh) Table name: Book 9

[3.2.3.](#_z337ya) Table name: Copy 10

[3.2.4.](#_3j2qqm3) Table name: CirculatedCopy 10

[3.2.5.](#_1y810tw) Table name: Reservation 10

[4. Class diagram (p.61 – p70) 11](#_4i7ojhp)

[4.1. List of classes in the Layers 11](#_2xcytpi)

[4.2. Modeling the Class Behaviors - sequence diagrams ( p. 66, 77) 11](#_1ci93xb)

[4.2.1. Sequence diagram for use case “Borrow Book” 11](#_3whwml4)

[4.2.2. Sequence diagram for use case “Return Book” 12](#_2bn6wsx)

[4.2.3. Sequence diagram for use case “Reserve Book” 13](#_qsh70q)

[5. User Interface Model Design (p. 70 – p.74) 13](#_3as4poj)

[5.1. User interface model design 13](#_1pxezwc)

[5.2. Interface Flow Diagrams (p. 51) 13](#_49x2ik5)

# **Revision history**

| **Date** | **Authors** | **Modifications** | **Version** |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

# **Document description**

This document describes OO solution version 1.0 for Library system. It is divided into the following sections:

* In the section 2 an overview of the Library system’s requirements will be provided, including list of system users, use cases, use case diagram, and activity diagrams that describes the most important use case scenarios.
* In the section 3 an E-R diagram and all tables of the Library system in detail will be presented.
* In the section 4 all classes organized in the layers and their behaviors (sequence diagrams) for the most important use cases will be presented.
* In the section 5 the most screen prototypes will be presented.

# **SRS overview**

## **2.1. List of system users**

1. Admin: The person is working in the Library room

2. Borrower: The person uses services of the Library system

## **2.2. List of use cases**

1. Login

2. Logout

3. View books

4. Request book

5. Return book

6. View record

7. Manage book

8. Manage category

9. Manage user

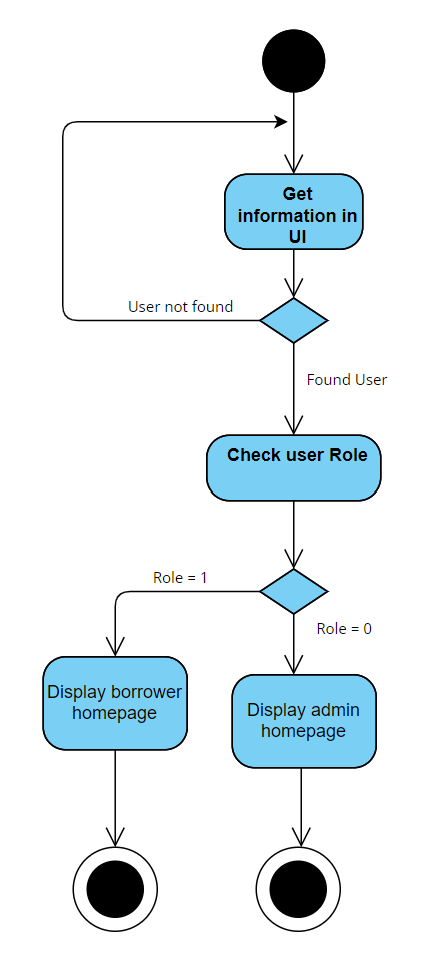
10. Search book

## **2.3. Use case diagram**

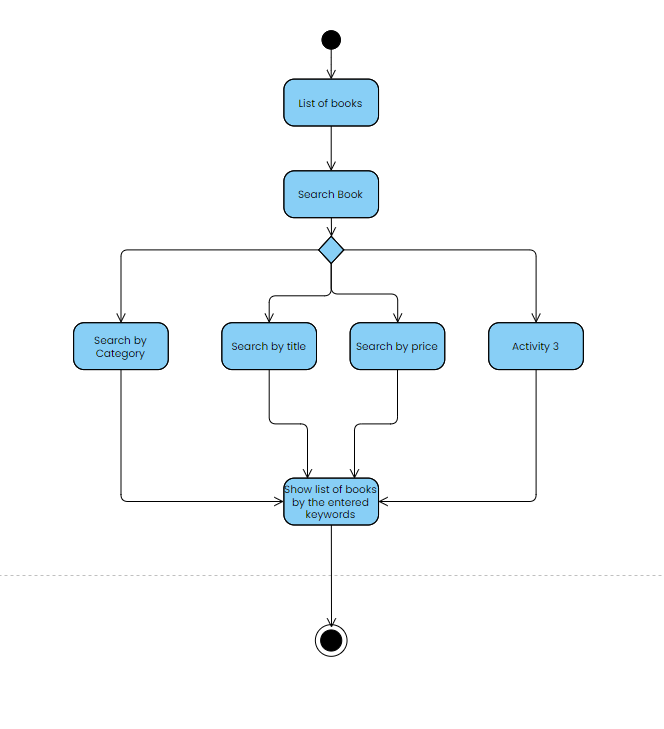
## 

## **2.4. Activity diagrams of use case scenarios**

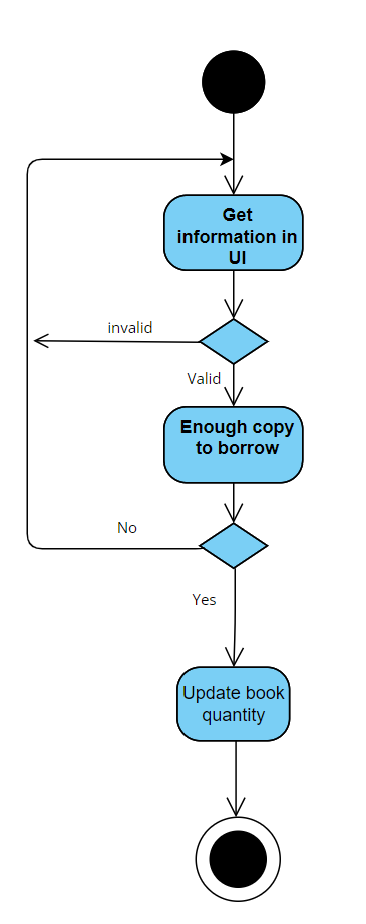
### **2.4.1. Activity diagram for use case “Login”**



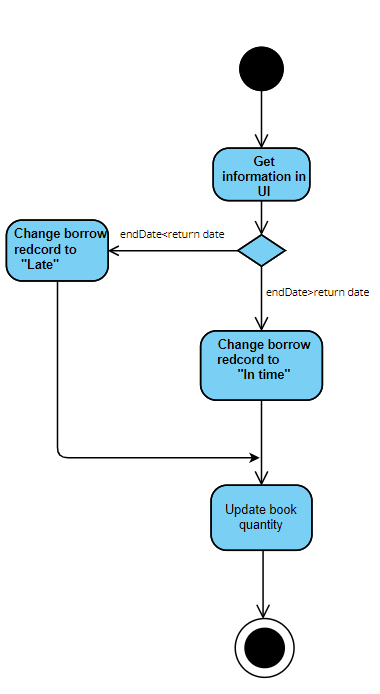
### **2.4.2. Activity diagram for use case “View Book”**



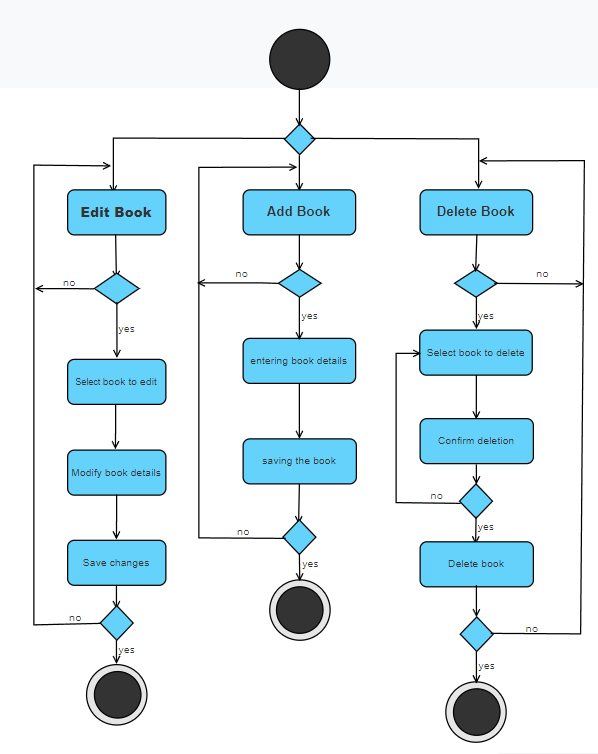
### **2.4.3. Activity diagram for use case “Request Book”**



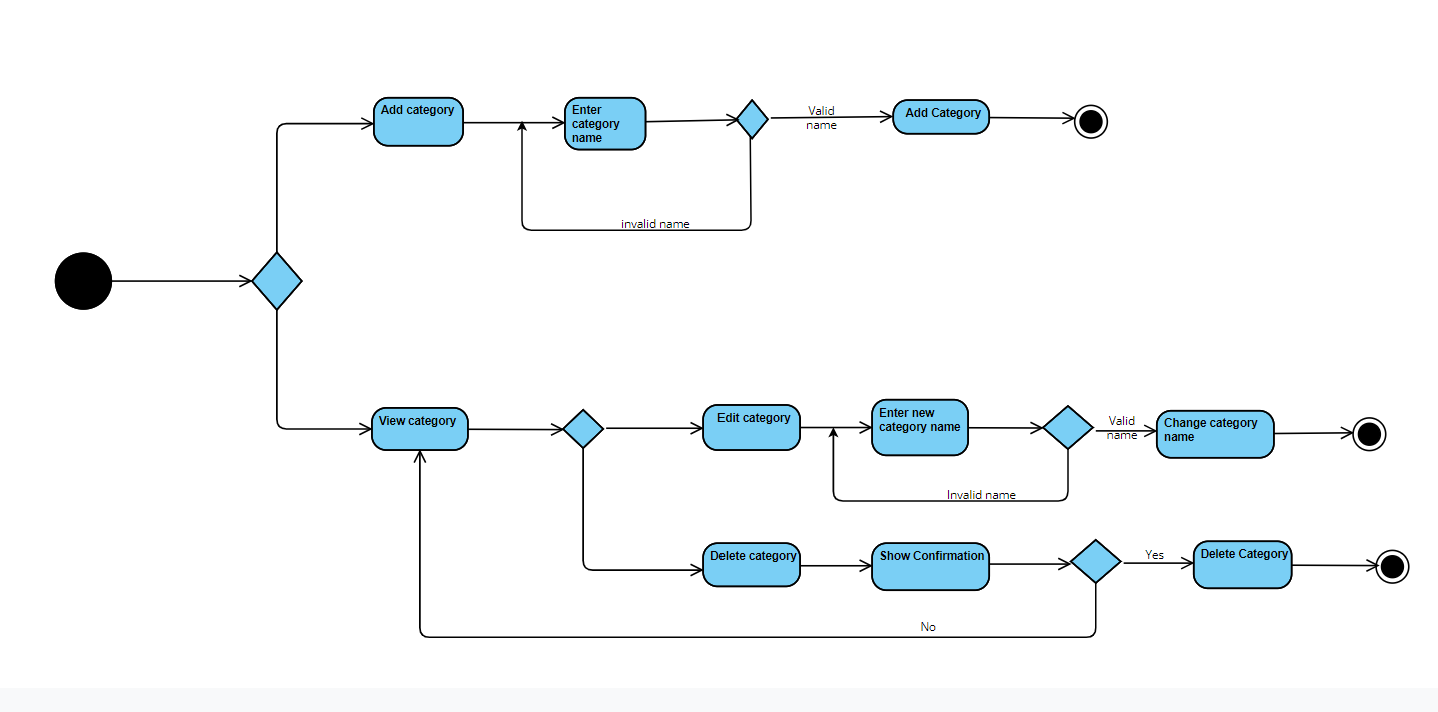
### **2.4.4. Activity diagram for use case “Return Book”**



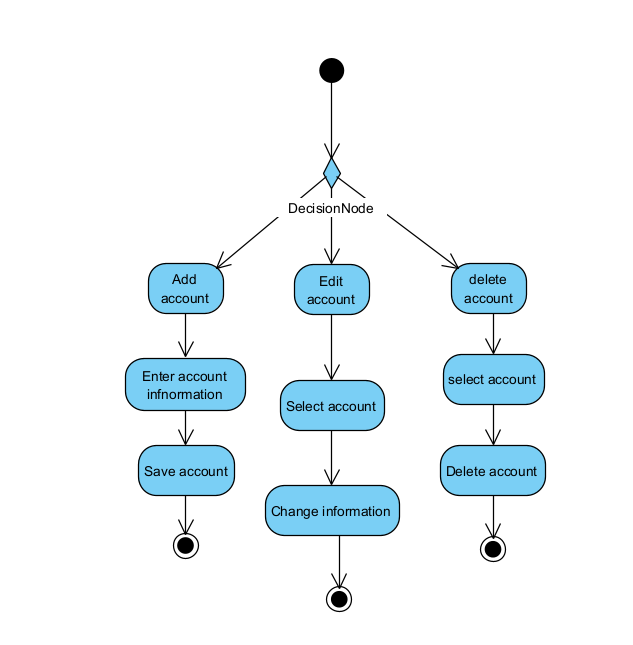
### **2.4.5. Activity diagram for use case “Manage Book”**



### **2.4.6. Activity diagram for use case “Manage category”**

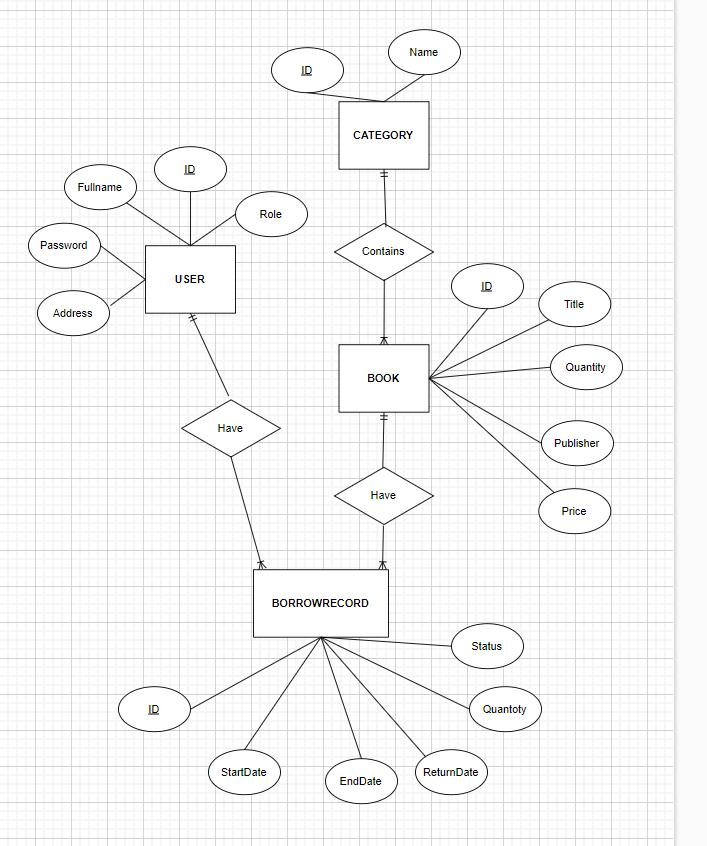


**2.4.7. Activity diagram for use case “Manage user”**

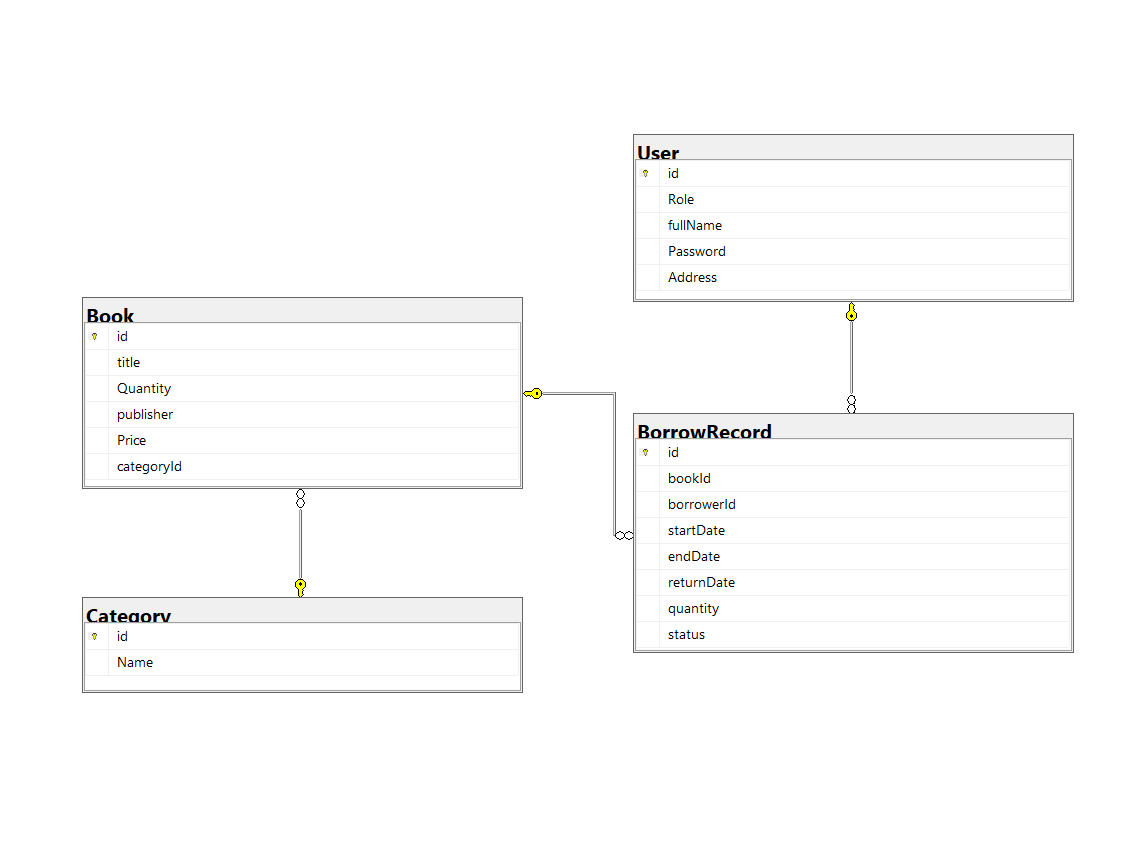


# **Data model**

## **Entity Relationship Diagram**

**

## **Database Diagram**

**

## 

## **Table details/Chi tiết các bảng**

Note: Attribute with underline is Primary key

### **Table name: User**

| **Field name** | **Type** | **Size** | **Note** |
| --- | --- | --- | --- |
| ID | Integer | 10 | Primary key |
| Role | Integer | 10 | Not null |
| Address | String | 40 | Allows null |
| Fullname | String | 40 | Not null |
| Password | String | 40 | Not null |

### **Table name: Book**

| **Field name** | **Type** | **Size** | **Note** |
| --- | --- | --- | --- |
| ID | Integer | 10 | Primary key |
| Title | String | 40 | Not null |
| Publisher | String | 40 | Allows null |
| Quantity | Integer | 10 | Not null |
| Price | Integer | 10 | Not null |
| CategoryId | Integer | 10 | Not null |

### **Table name: BorrowRecord**

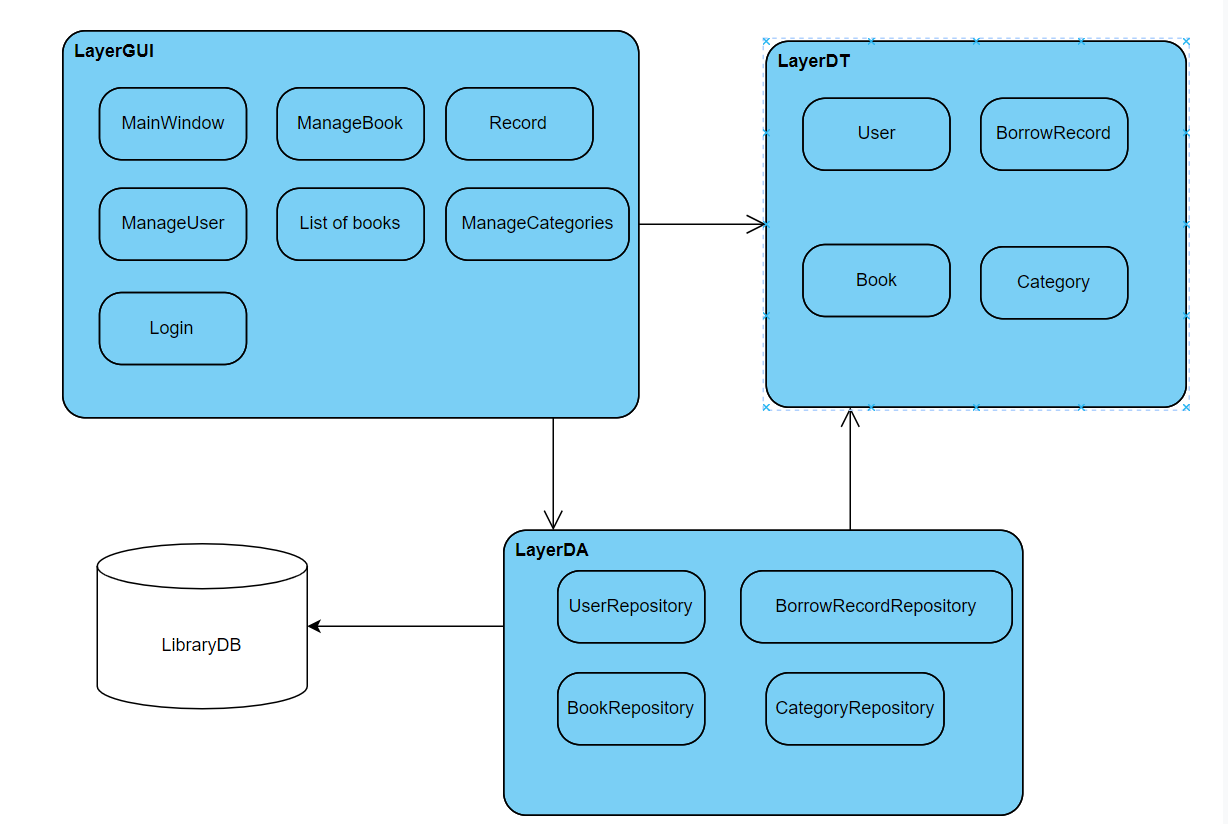
| **Field name** | **Type** | **Size** | **Note** |
| --- | --- | --- | --- |
| BookId | Integer | 10 | Foreign key, refers to Book table |
| CopyNumber | Integer | 10 | Primary key |
| BorrowerId | Integer | 10 | Foreign key, refers to User table |
| StartDate | Datetime | 7 | Not Null |
| EndDate | Datetime | 7 | Not Null |
| ReturnDate | Datetime | 7 | Allow Null |
| Quantity | Integer | 10 | Not Null |
| Status | String | 40 | Allow Null |

### **Table name: Category**

| **Field name** | **Type** | **Size** | **Note** |
| --- | --- | --- | --- |
| ID | Integer | 10 | Primary key |
| Name | String | 40 | Allow null |

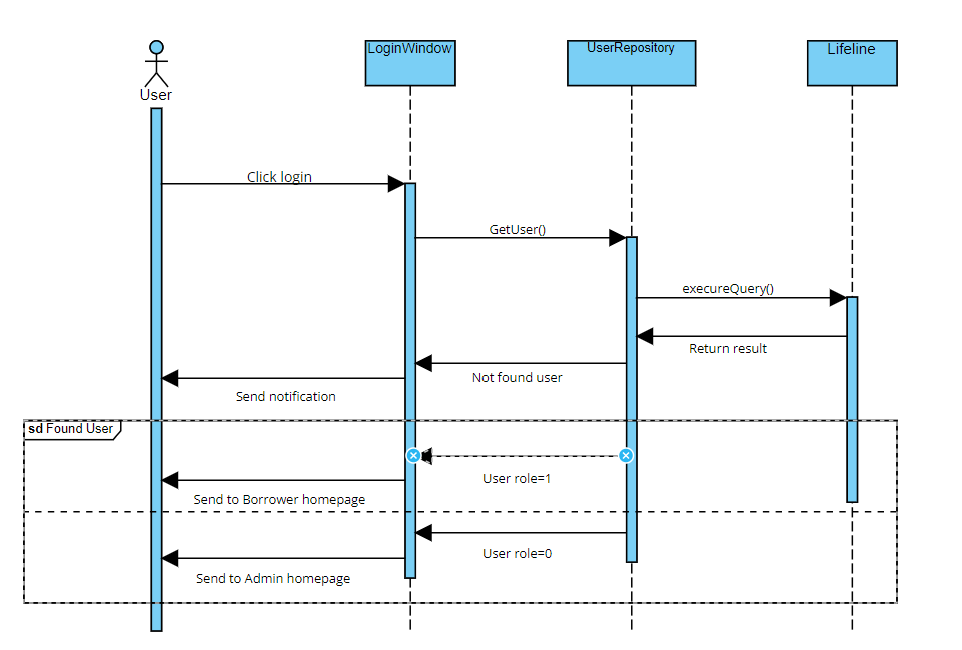
# **Class diagram (p.61 – p70)**

## **List of classes in the Layers**

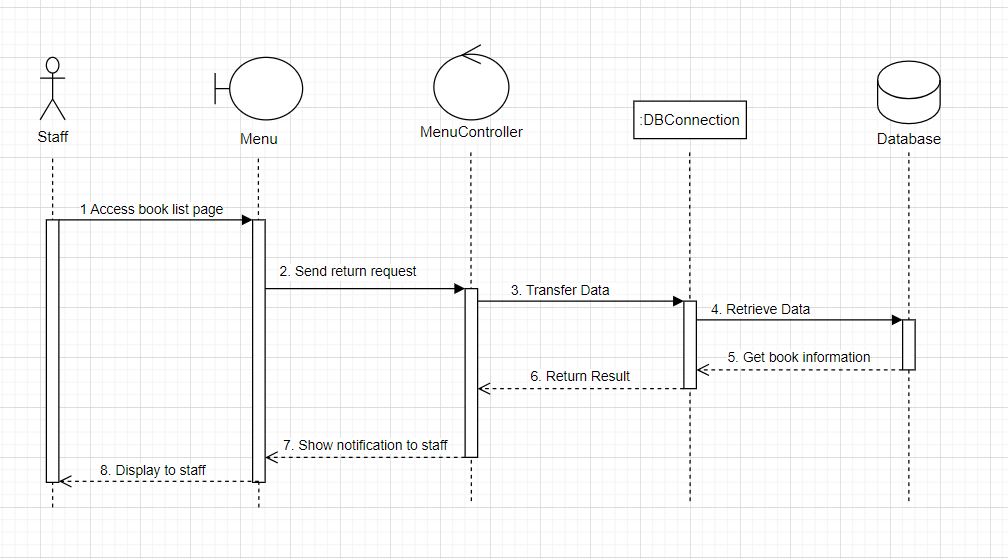


## **Modelling the Class Behaviours - sequence diagrams ( p. 66, 77)**

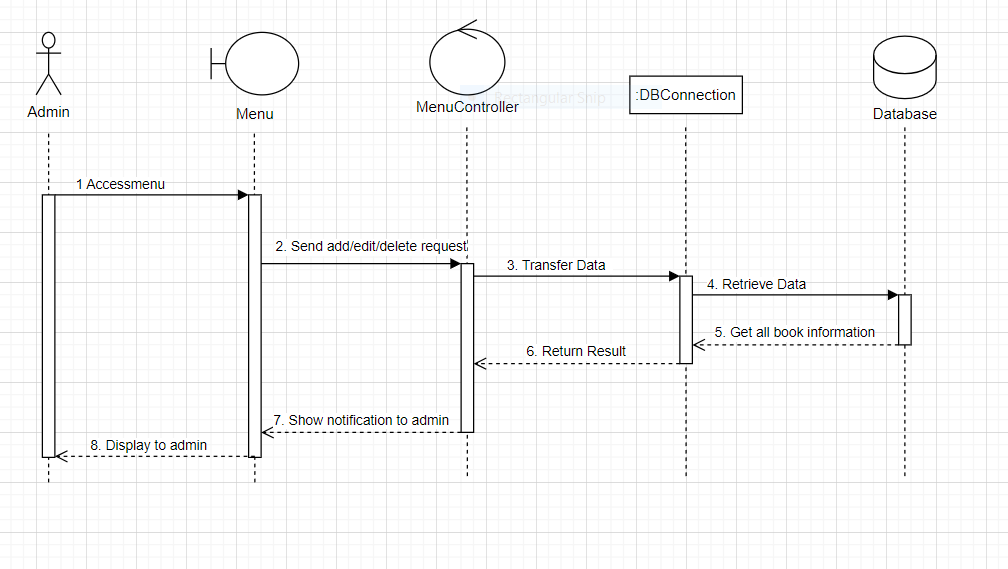
### **Sequence diagram for use case “Login”**



### **Sequence diagram for use case “Return Book”**



### **Sequence diagram for use case “Manage Book”**



### **Sequence diagram for use case “ManageUser”**

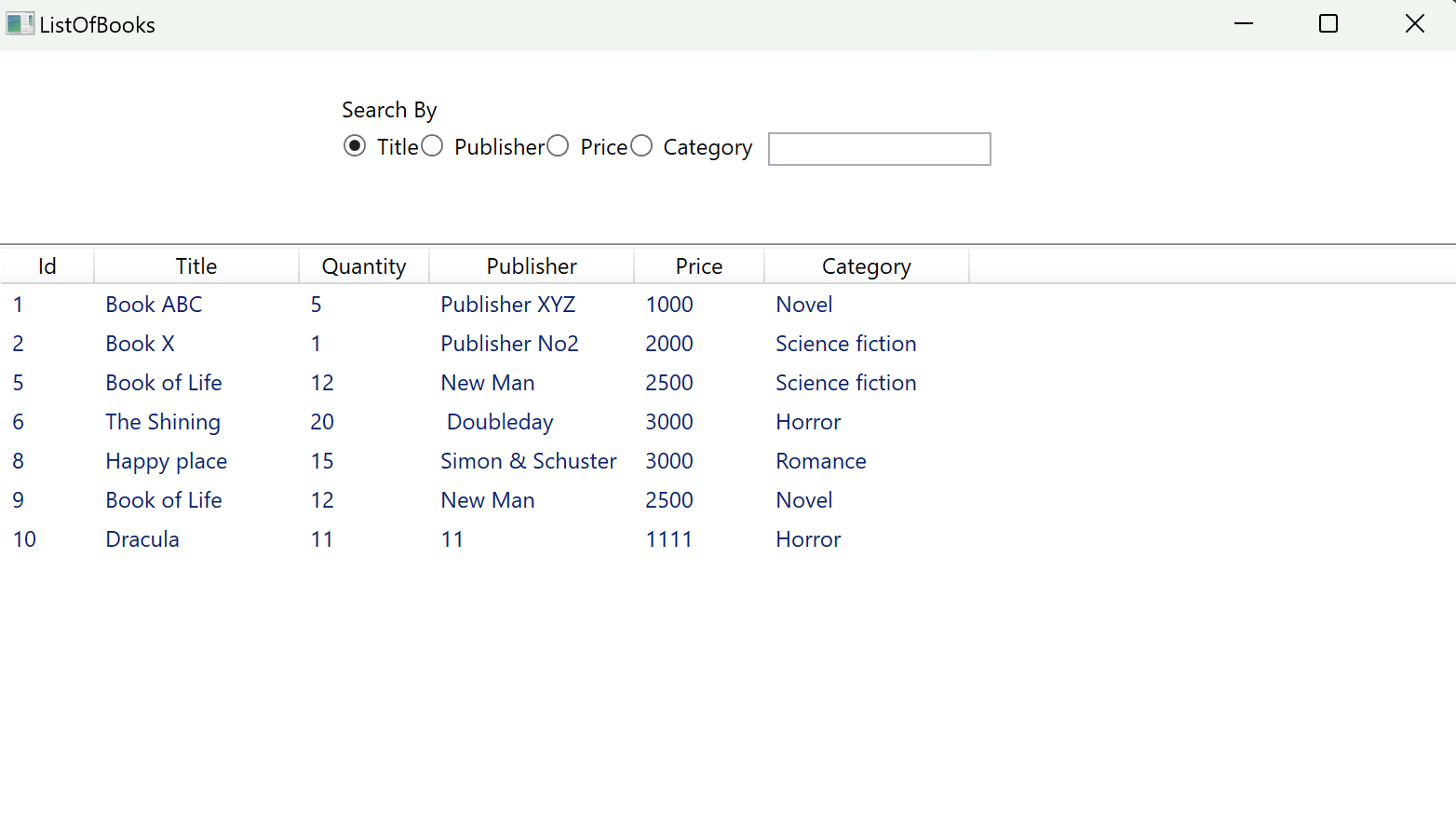
### 

### 

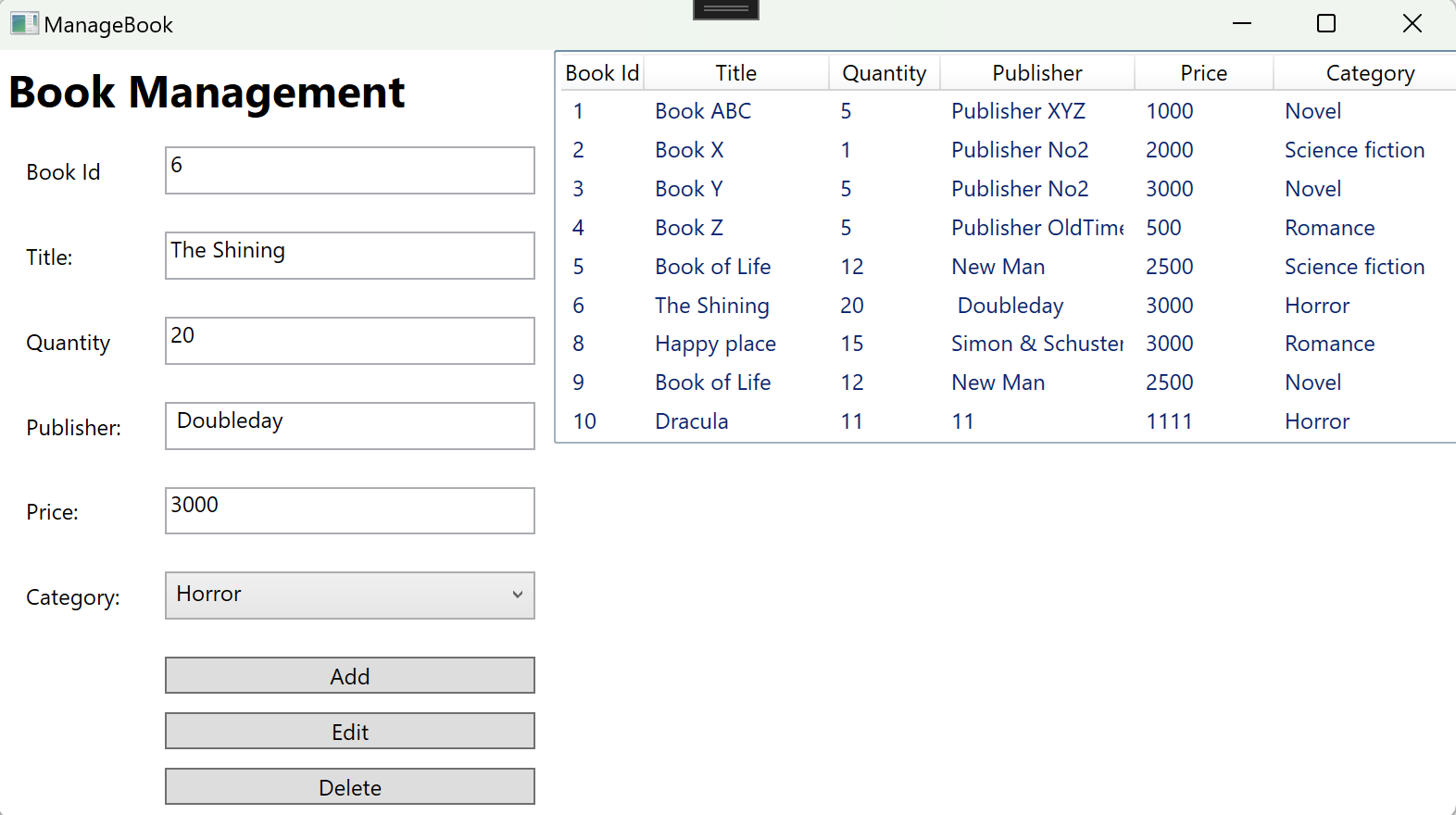
# **User Interface Model Design (p. 70 – p.74)**

## **User interface model design**

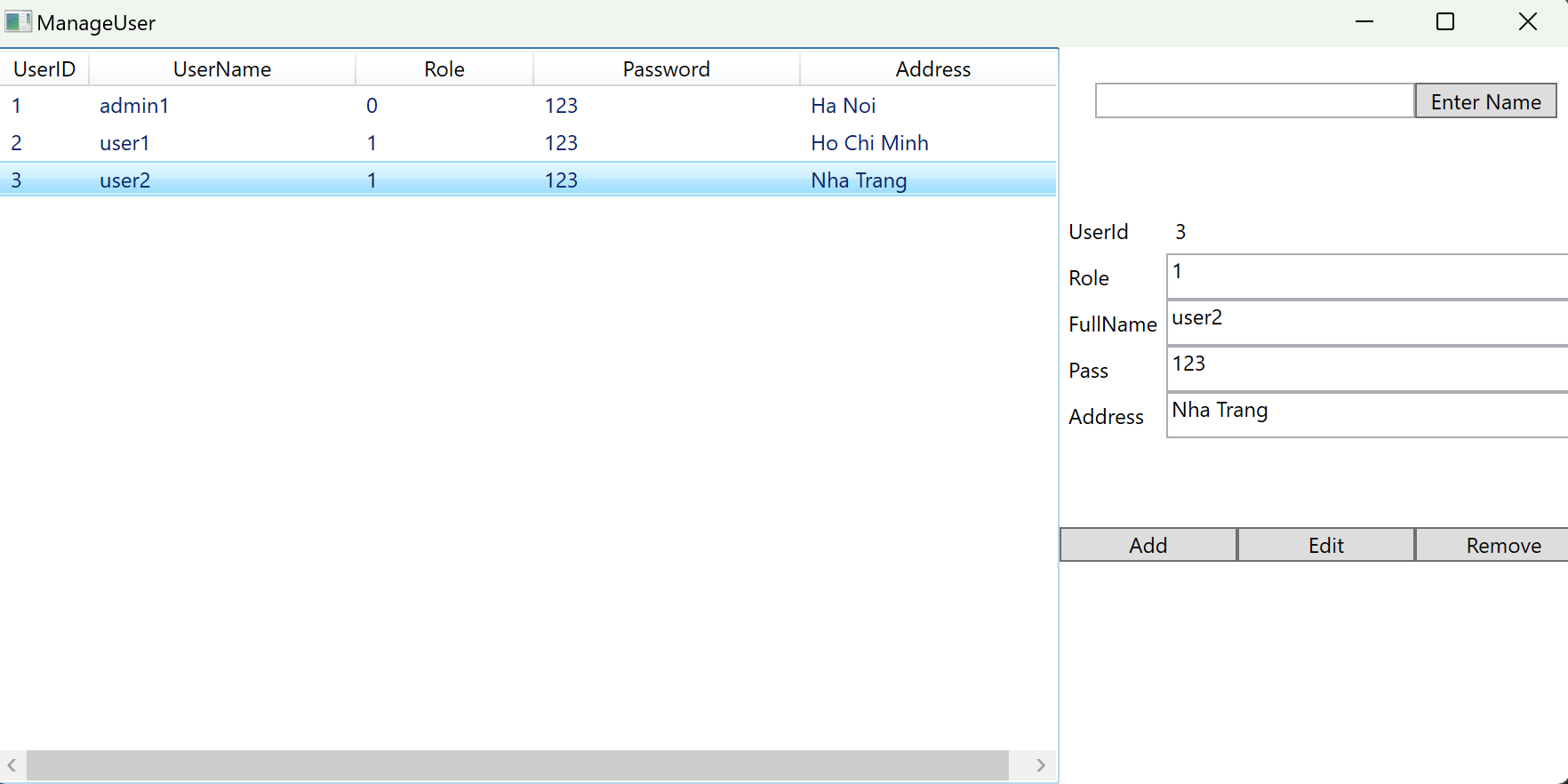
### **51.1. Screen “View Book”**



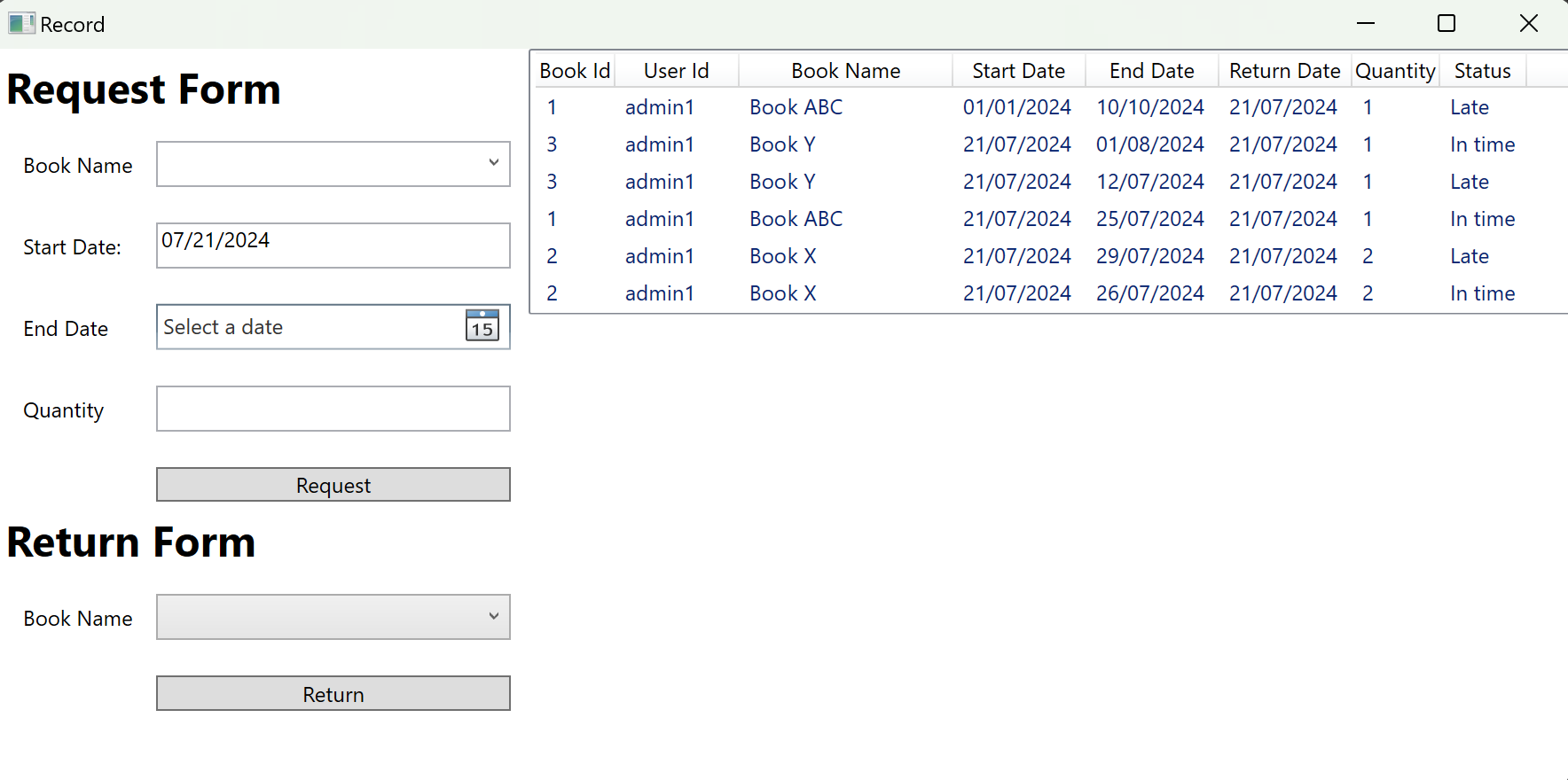
### **51.2. Screen “Manage books”**



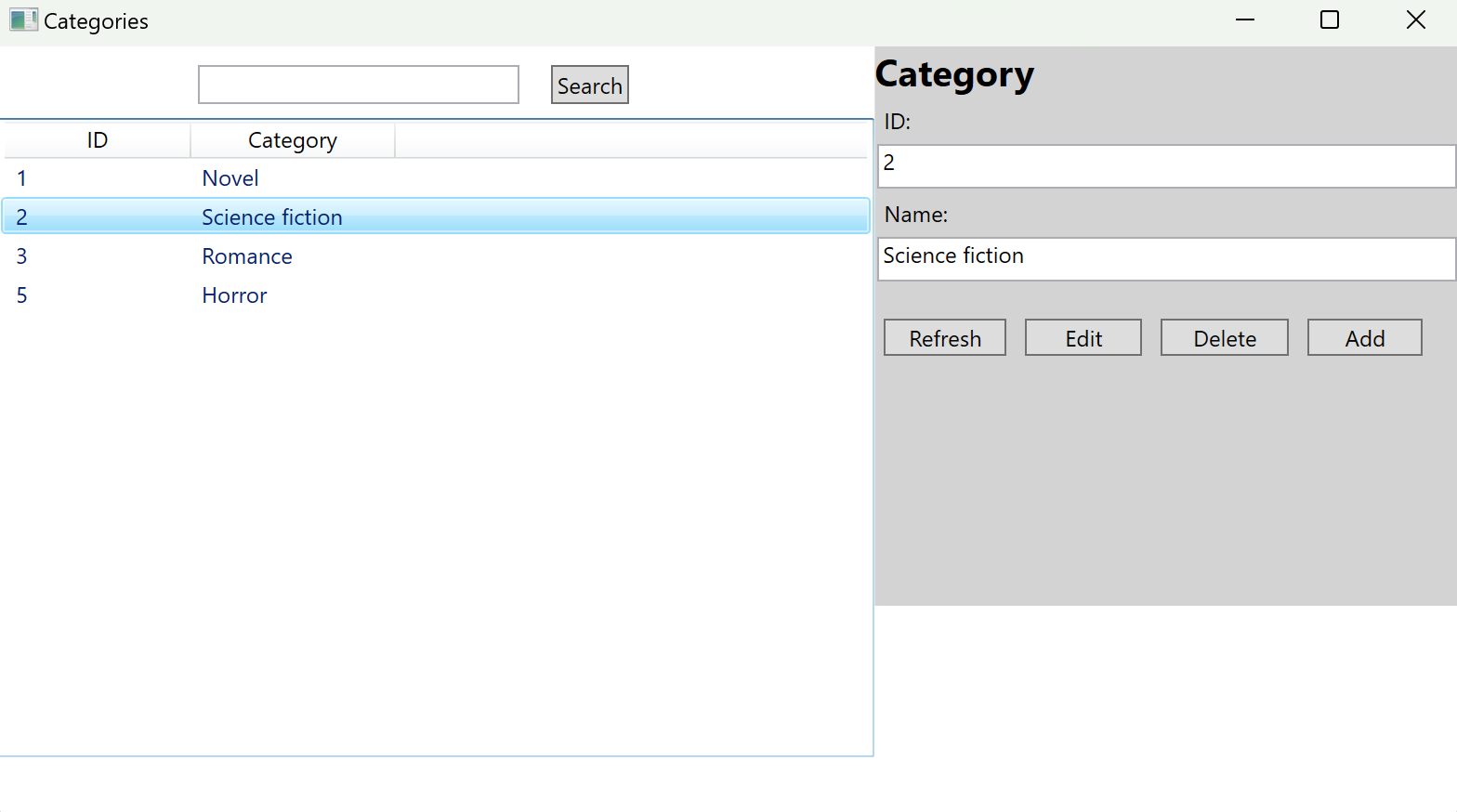
### **5.1.3. Screen “Manage user”**



### **5.1.4. Screen “Request/Return books”**



### **51.5. Screen “Manage categories”**



## **Interface Flow Diagrams (p. 51)**

