Gebze Technical University Faculty of Engineering

Group 8

Library Management System

Project Final Report
https://github.com/Data-Structures-Project

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2 Problem Definition:

Many institutions need systems where they can enter their data and access this data easily when requested. Especially libraries need these systems. In the absence of these systems, that is, when the data is kept manually, many problems are encountered by the library staff and users. These problems are:

- Information of libraries belonging to an institution,
- The information of the staff and in which library they work,
- Which books and magazines are in the libraries, the number of these books
- Location of books and magazines in the library
- Information of library users
- Information on which books users have delivered and which books they have not delivered
- Keeping information about books, for example; author of the book, number of pages, publishing house
- Keeping information about authors and publishers with books in the library
- Adding new library, staff and users to the system
- Updating existing libraries, staff and users information
- Filtering method suitable for the information sought in the system - Safe storage of data
- An easy interface for staff and users

To answer these problems, a system with different user profiles is needed. Thanks to this system, data can be stored securely and data loss is minimized. New data can be easily entered and existing data can be easily updated. The authorized persons can easily access the data from anywhere. Staff and users minimize time loss and workload. Makes it easier to track and access library materials such as books and magazines. By handling many tasks in the form of automation, it ensures that the margin of error is minimized. The system that provides these benefits and is recommended torespond to problems is the Library Management System.

3 Users of the System:

Library Management System consist 4 type of users.

3.1 Administrators:
Administrators are responsible for add new libraries to system or remove libraries from the system, add new library manager to system or remove library managers from system and see or edit library managers informations.

3.2 Library Manager:
Library manager are responsible for only their library. They add new Librarian to library or remove librarians, see-edit librarian's informations and search librarian, They update library informations like library librarians, library adress etc.

3.3 Librarian:
Librarians are responsible for only their library. They add new reader or delete reader, see reader's information or update reader's information, search reader, book, magazine, author, add new books magazines, update books-magazines and they update borrowed book list like, when the book has taken, when the book has given back and who has borrowed book.

3.4 Reader:
Readers can borrow books from only the library they are a member and they can loan magazines. They can search a books and magazines for it's category, author, name, publisher and rate. They can look for is the book, magazine available for now or has taken already and They can look place of the book in library which they want to borrow. They can rate a book

4 Requirements in Details:

4.1 Functional Requirements

The system will be used for administrator, library manager, librarian and reader. All users will enter the system with their user ID and passwords.

Administrators,
• Must add/remove library
• Must edit library

Library manager,
• Must add/remove Librarian
• Must edit Librarian
• Must see/search Librarian

• Must edit library

Librarian,
• Must add/remove Reader
• Must edit Reader
• Must add/remove book
• Must edit book
• Must add/remove loan book
• Must edit loan book
• Must add/remove author
• Must edit author
• Must add/remove category
• Must edit category
• Must add/remove publisher
• Must edit publisher
• Must add/remove magazine
• Must edit magazine
• Must search/see Reader
• Must search/see book
• Must search/see loan book and magazine

Reader,
• Must see loan books and magazines
• Must search/see book by book name
• Must search/see book by category
• Must search/see book by author
• Must search/see book by publisher
• Must search/see magazine by magazine name
• Must search/see magazine by category
• Must search/see magazine by author
• Must search/see magazine by Publisher

4.2 Non- Functional Requirements

4.2.1 Usability Requirements

The system is useful because users will perform their operations with an interactive Menu, they can select the option they want from the menu and proceed and username/password mechanism should be useful for user.

4.2.2 Security Requirements

All passwords must be hard to guess and ideally require upper/lower case letters and special symbols to ensure high security also only admins can access this information.

4.2.3 Performance Requirements

The data in the system will be dynamic and this data will expand as users log in. At the same time, the algorithms we use will improve the performance.

4.2.4 Space Requirements

The data in the system will be dynamic and user information will be in this data such as book name, author, member information, employee information etc. Because of these, an expandable space is required.

4.2.5 Operational Requirements

The system must be in communication with the users in order to perform the necessary operations. User data and interaction is one of the most basic requirements in this system.

4.2.6 Environmental Requirements

The program is designed for the computer and will be written in a way to run on a computer terminal.

4.2.7 Learnability Requirements

When users see the interface, they can understand and implement the main actions.

4.2.8 Accounting Requirements

The system must have admin. Admin can confirm librarian, reader and library manager to register in the system. The operations to be performed by these accounts are determined by the administrators.

4.2.9 Development Requirements

This system will be developed by many developers at the same time, and the development environment must be suitable for it.

5 Use of Collections:

It had added due to feedback

5.1 List:

Reasons for using the list: We can keep more than one collection in the list reference (such as Linked list, Array List). It has an easy-to-use and well-known interface. It is generally used where it does not need to be sorted and where there is not much manipulation in the collection. Materials were also kept in the list for the author class. Here we used it to hold books or magazine written by the author. Materials were also kept in the list for the publisher class. Here we used it to hold books or magazine published by the publisher.

5.2 Stack:

The Stack structure is used when the last added item will be used first. We used this data structure to hold the votes in the material class. Thus, the last rating in that book or journal will appear first.

5.3 Graph:

Graph data structure is used in LibraryRepository class to store library type objects. The reason why this data structure is used to store the library is to see the connections and distances between the libraries. It is required for operations such as carrying books.

5.4 AVLTree / Binary Search Tree:

AVL Tree is used to store publishers and authors. The reason for using these data structers is that authors and publishers are frequently searched. AVLTree was used to minimize the cost of the search process. Also, the elements need to be accessed in sorted order. The reason why Hash is not used here is the necessity of order operations.

5.5 Hash:

HashMap data structure was used to store accounts. The reason for using Hash here is that there is no order operation between accounts. In addition, the use of Hash offers advantages such as fast(O(1) insertion, deletion and search.

5.6 Skip List:

Skip List is used to store materials (books and magazines). The reason for using the Skip List is that the search and add/remove operation costs are very critical,

as well as the need to store the materials in order. Also, material operations are the operations that will be used the most. Therefore, the advantage of concurrent access forced us to use skip list when storing materials.

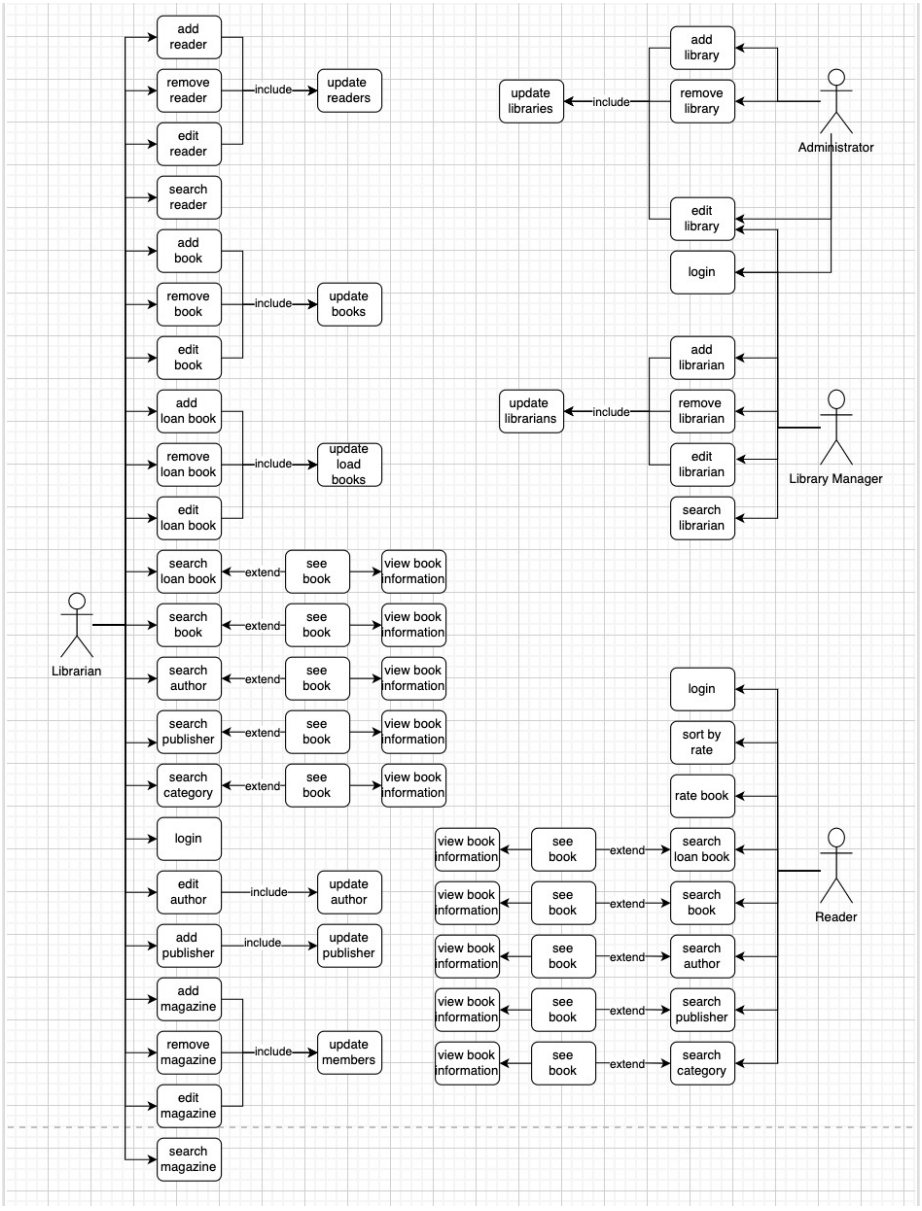
5.7 Priority Queue:

There is a heap in the first version of implementation. But in the final version, there is no need to use it since it is going to be unefficient. Minimum element access is needed nowhere in the project.

5.8 Merge Sort Algorithm:

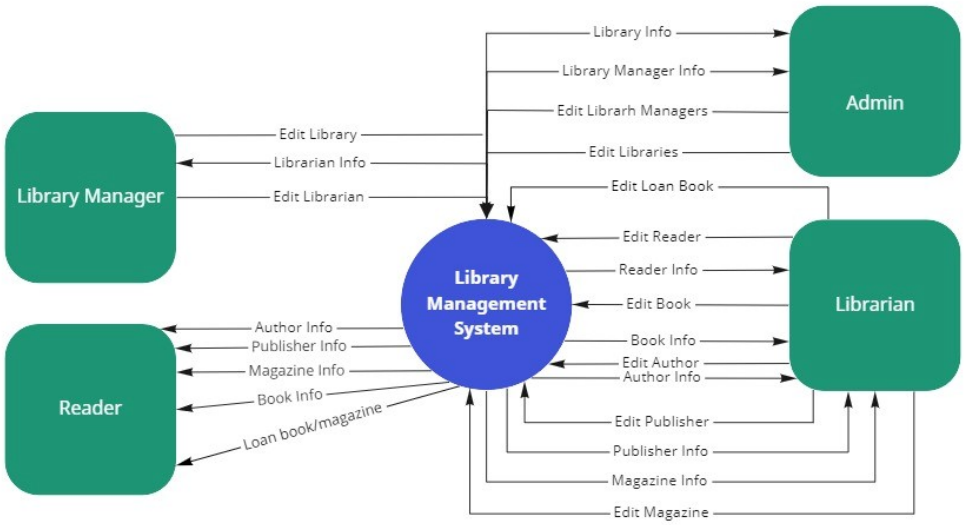
Merge Sort is used to sort materials by rate. The reason for using it is that it works stable-fast and we do not have a problem with memory.

6 Use-Case Diagrams:

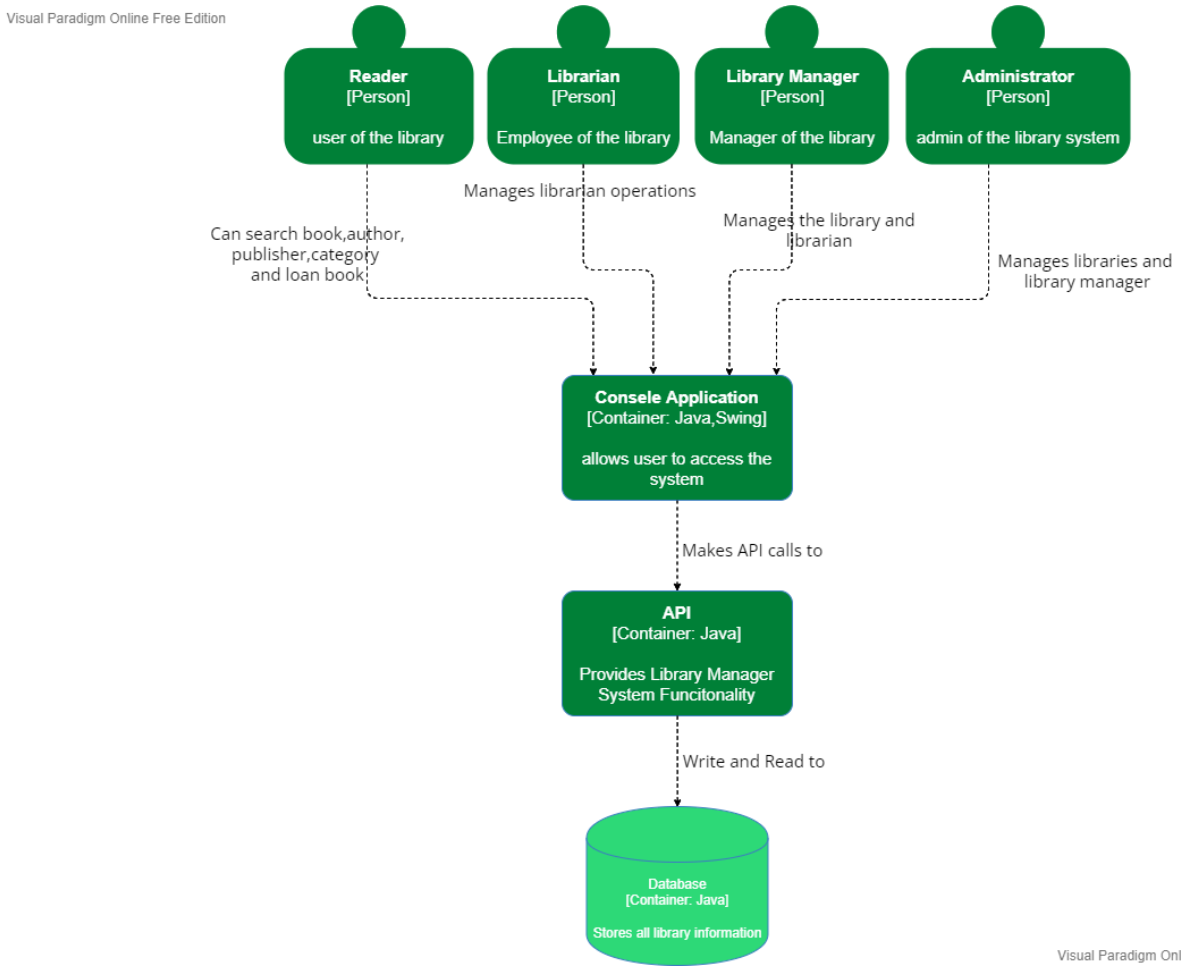


7 C4 Model of the System:

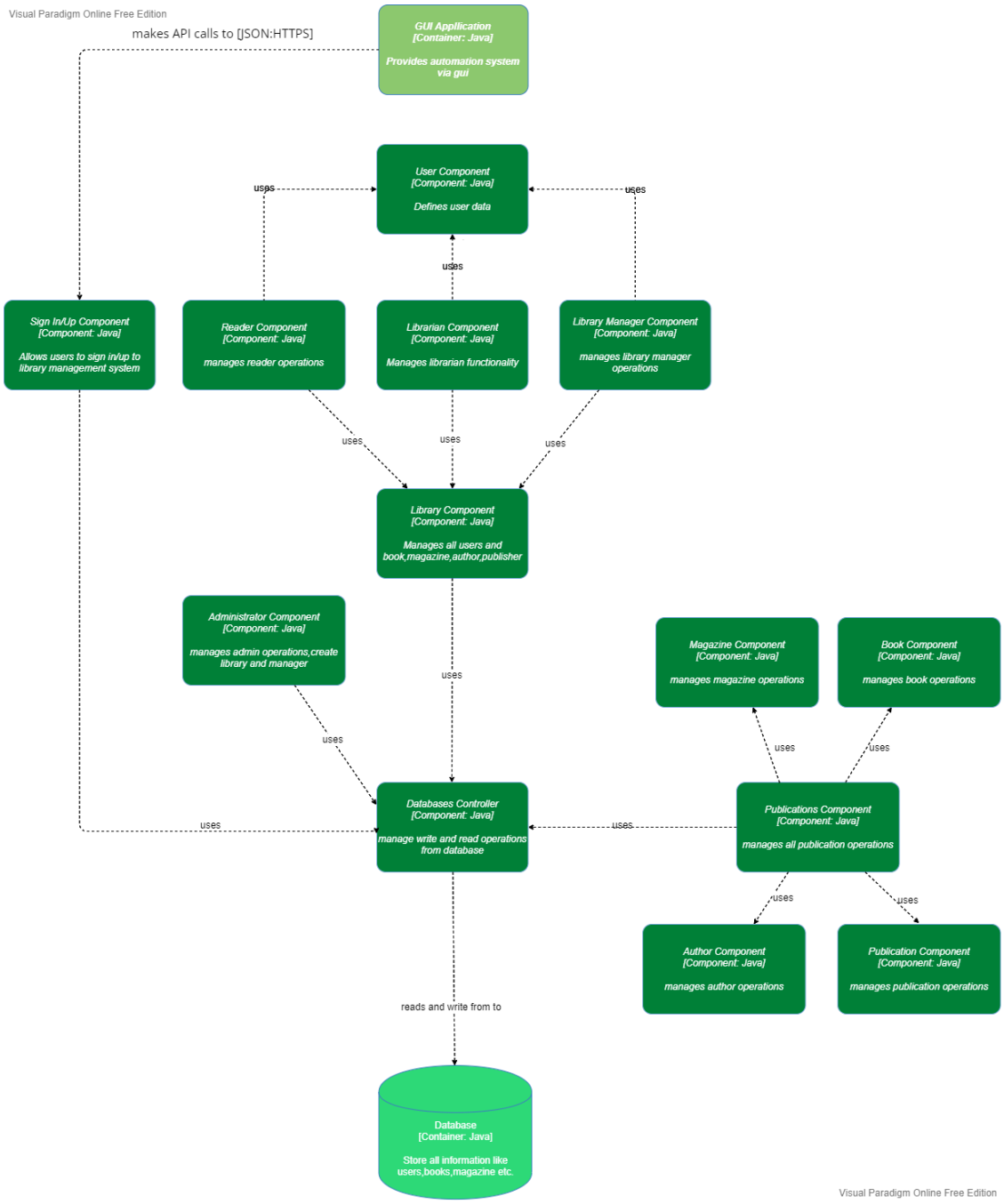
7.1 Context Model:



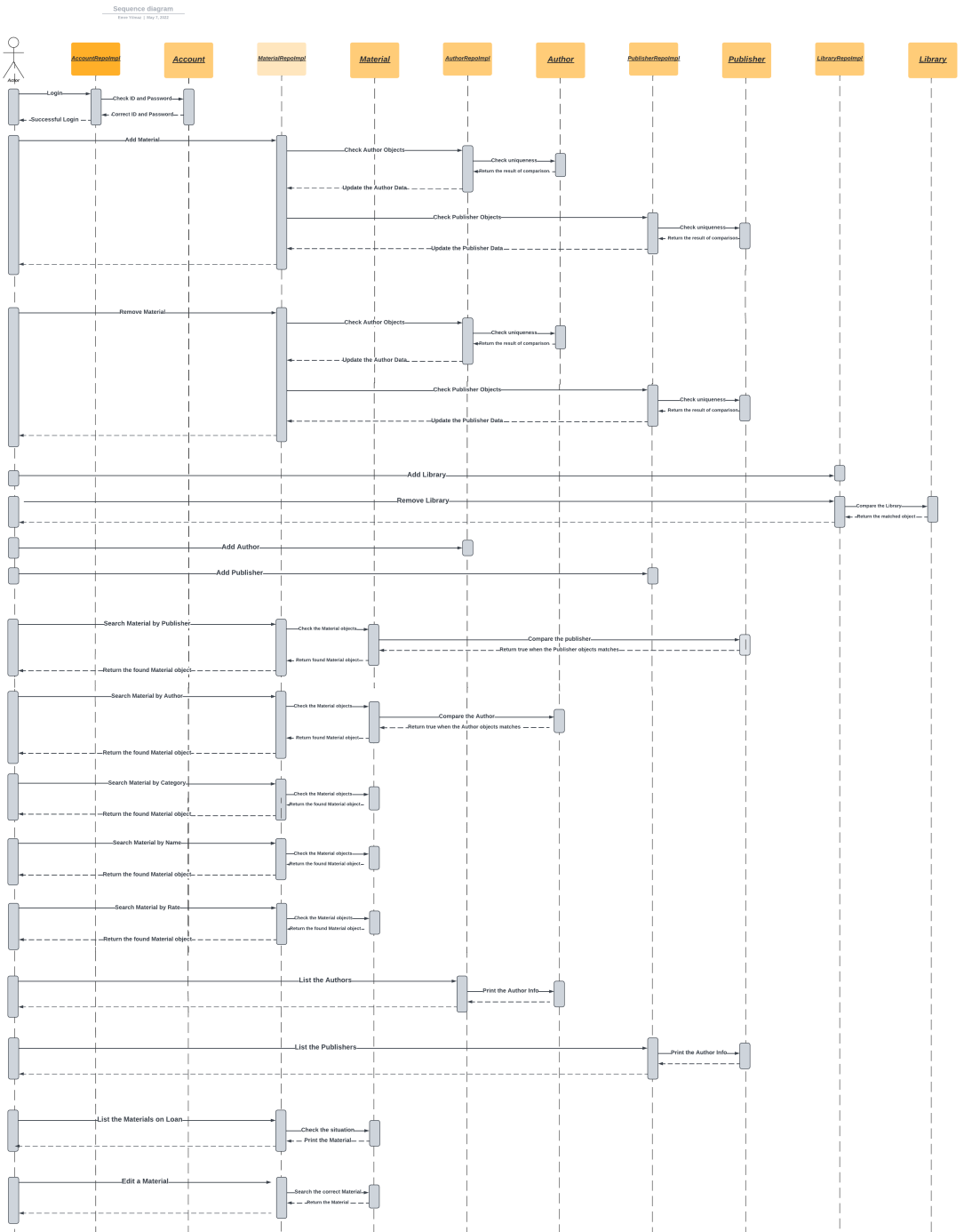
7.2 Container Diagram:



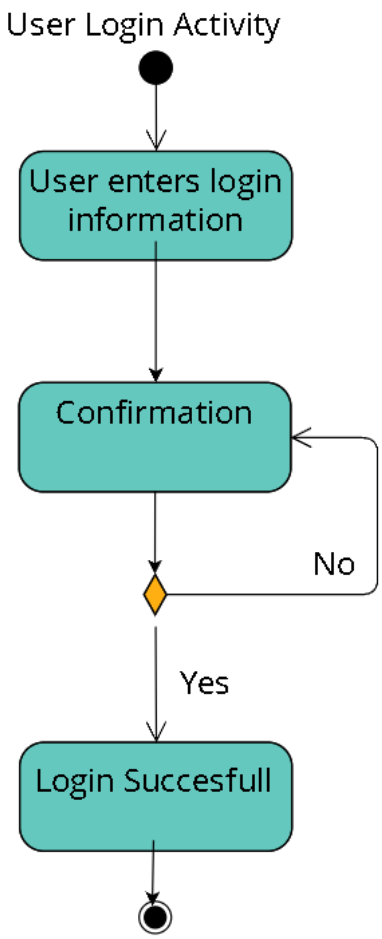
7.3 Component Diagram:

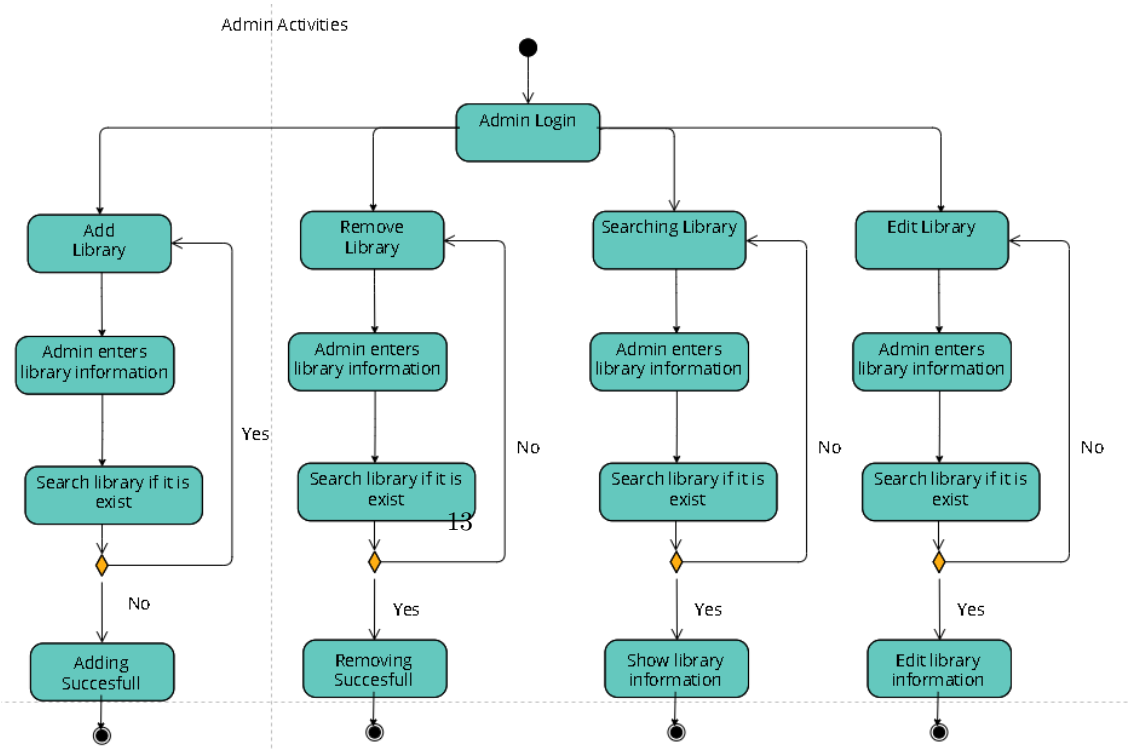


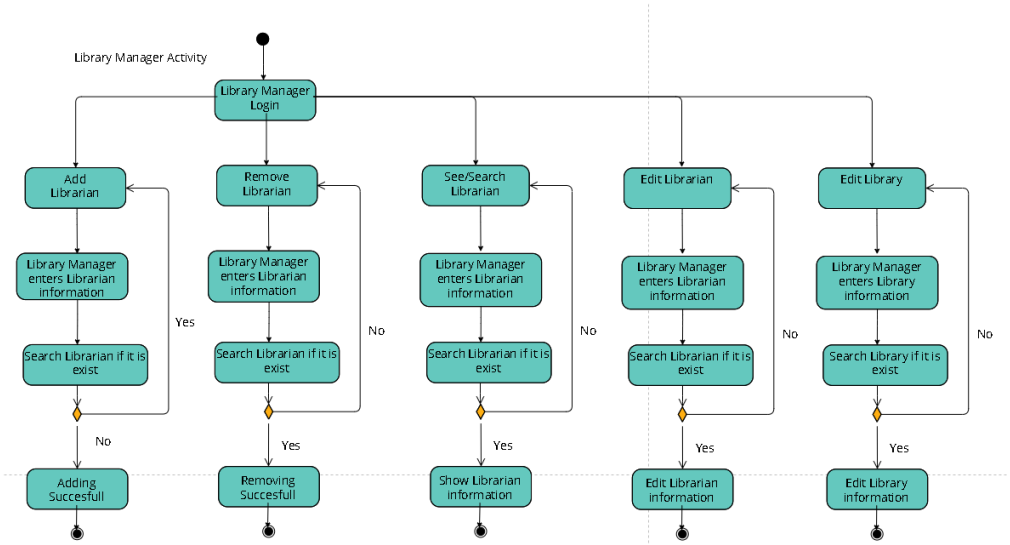
7.4 Sequence Diagram:

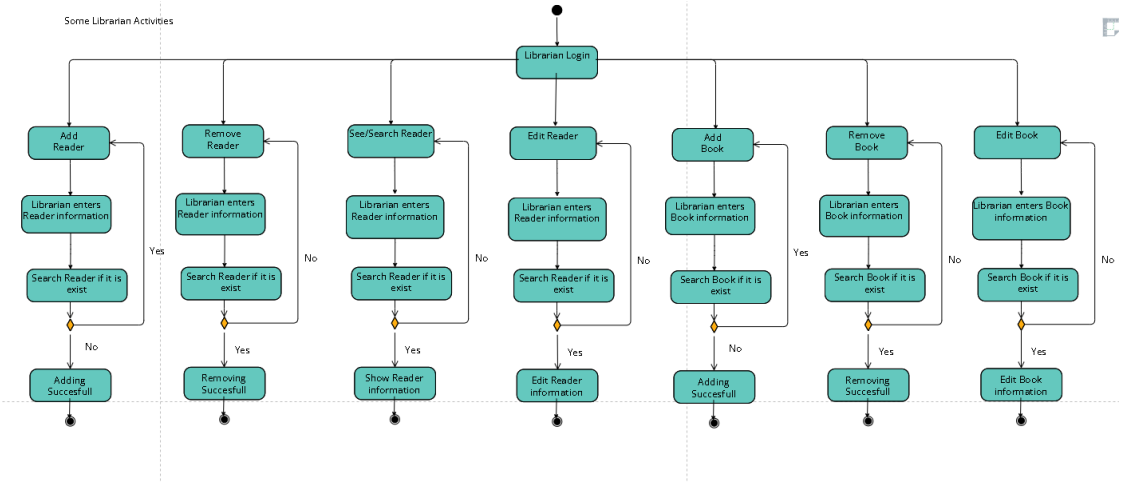


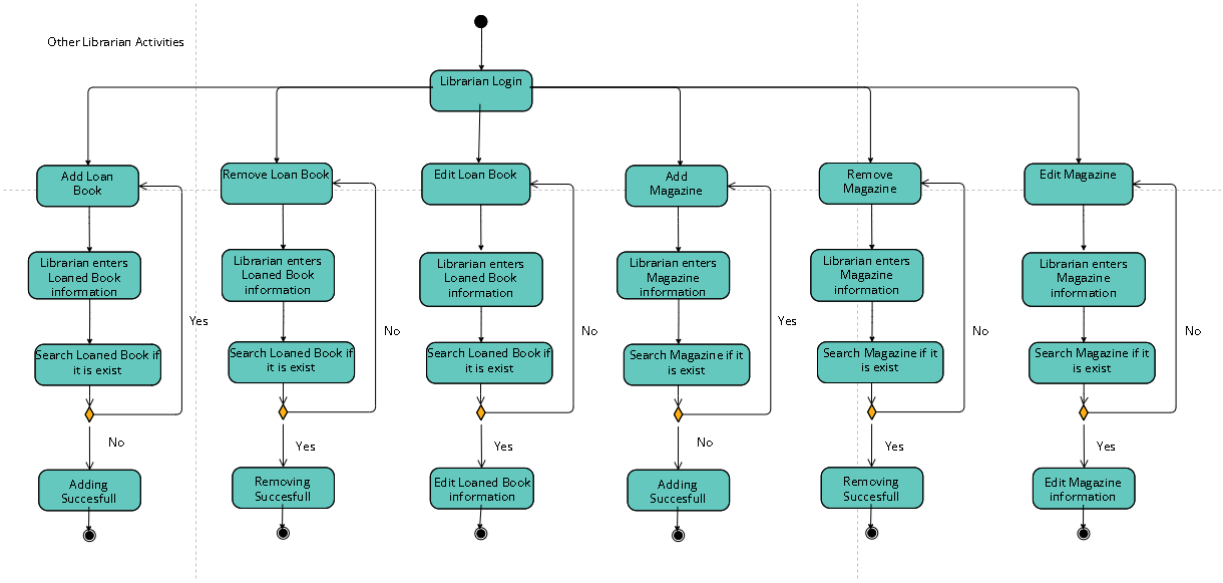
7.5 Activity Diagram:

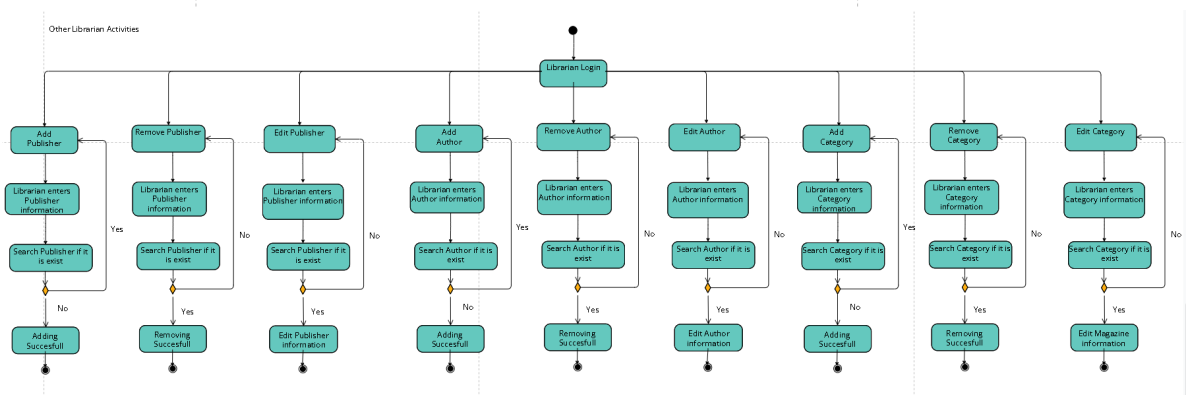


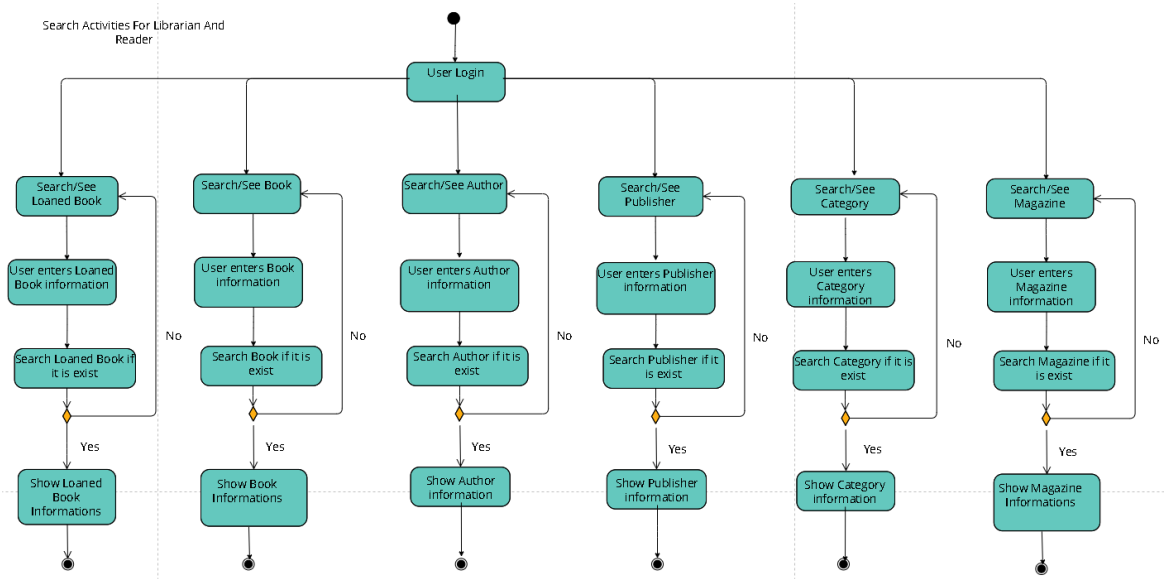


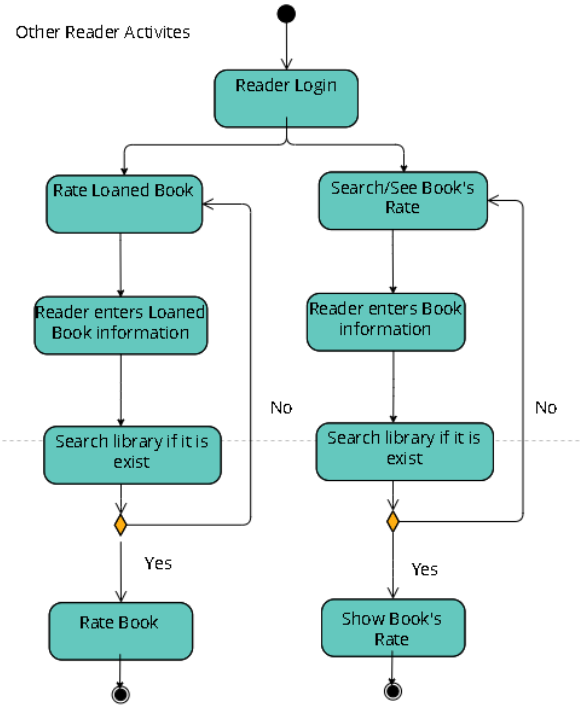

Library Manager Activity
Library Manager Login
Add Librarian
Remove Librarian
See/Search Librarian
Edit Librarian
Edit Library
Library Manager enters Librarian information
Library Manager enters Librarian information
Library Manager enters Librarian information
Library Manager enters Librarian information
Library Manager enters Library information
Search Librarian if it is exist
Search Librarian if it is exist
Search Librarian if it is exist
Search Librarian if it is exist
Search Library if it is exist
Yes
No
No
No
No
No
Yes
Yes
Yes
Yes
Adding Succesfull
Removing Succesfull
Show Librarian information
Edit Librarian information
Edit Library information


Some Librarian Activities
Librarian Login
Add Reader
Remove Reader
See/Search Reader
Edit Reader
Add Book
Remove Book
Edit Book
Librarian enters Reader information
Librarian enters Reader information
Librarian enters Reader information
Librarian enters Reader information
Librarian enters Book information
Librarian enters Book information
Librarian enters Book information
Search Reader if it is exist
Search Reader if it is exist
Search Reader if it is exist
Search Reader if it is exist
Search Book if it is exist
Search Book if it is exist
Search Book if it is exist
Yes
No
No
No
No
No
Yes
Yes
Yes
Yes
Adding Succesfull
Removing Succesfull
Show Reader information
Edit Reader information
Adding Succesfull
Removing Succesfull
Edit Book information

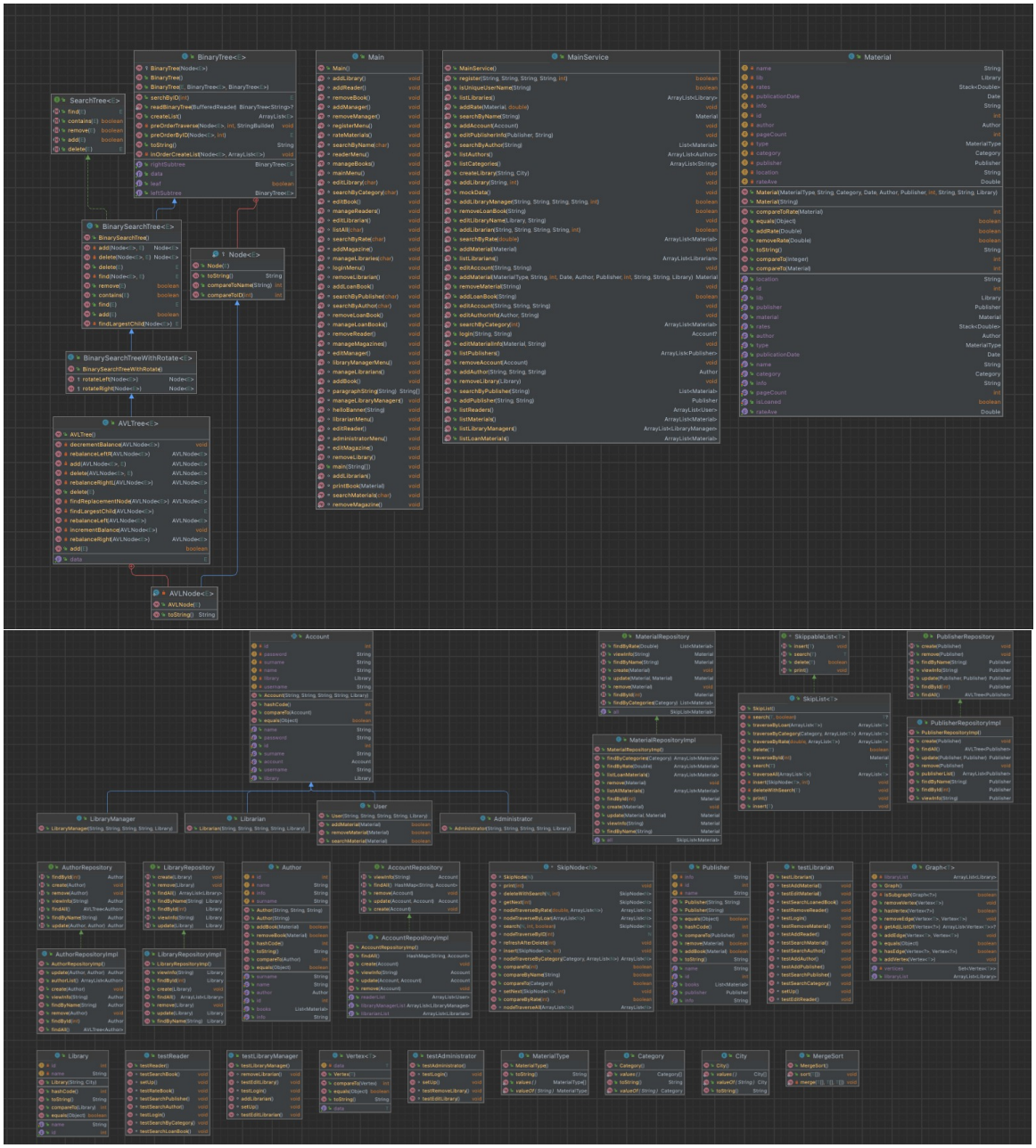

Other Librarian Activities
Librarian Login
Add Loan Book
Librarian enters Loaned Book information
Search Loaned Book if it is exist
Yes
No
Adding Succesfull
Remove Loan Book
Librarian enters Loaned Book information
Search Loaned Book if it is exist
No
Yes
Removing Succesfull
Edit Loan Book
Librarian enters Loaned Book information
Search Loaned Book if it is exist
No
Yes
Edit Loaned Book information
Add Magazine
Librarian enters Magazine information
Search Magazine if it is exist
Yes
No
Adding Succesfull
Remove Magazine
Librarian enters Magazine information
Search Magazine if it is exist
No
Yes
Removing Succesfull
Edit Magazine
Librarian enters Magazine information
Search Magazine if it is exist
No
Yes
Edit Magazine information


Other Librarian Activities
Librarian Login
Add Publisher
Librarian enters Publisher information
Search Publisher if it is exist
Yes
No
Adding Succesfull
Remove Publisher
Librarian enters Publisher information
Search Publisher if it is exist
No
Yes
Removing Succesfull
Edit Publisher
Librarian enters Publisher information
Search Publisher if it is exist
No
Yes
Edit Publisher information
Add Author
Librarian enters Author information
Search Author if it is exist
Yes
No
Adding Succesfull
Remove Author
Librarian enters Author information
Search Author if it is exist
No
Yes
Removing Succesfull
Edit Author
Librarian enters Author information
Search Author if it is exist
No
Yes
Edit Author information
Add Category
Librarian enters Category information
Search Category if it is exist
Yes
No
Adding Succesfull
Remove Category
Librarian enters Category information
Search Category if it is exist
No
Yes
Removing Succesfull
Edit Category
Librarian enters Category information
Search Category if it is exist
No
Yes
Edit Magazine information


Search Activities For Librarian And Reader
User Login
Search/See Loaned Book
User enters Loaned Book information
Search Loaned Book if it is exist
No
Yes
Show Loaned Book Informations
Search/See Book
User enters Book information
Search Book if it is exist
No
Yes
Show Book Informations
Search/See Author
User enters Author information
Search Author if it is exist
No
Yes
Show Author information
Search/See Publisher
User enters Publisher information
Search Publisher if it is exist
No
Yes
Show Publisher information
Search/See Category
User enters Category information
Search Category if it is exist
No
Yes
Show Category information
Search/See Magazine
User enters Magazine information
Search Magazine if it is exist
No
Yes
Show Magazine Informations


Other Reader Activites
Reader Login
Rate Loaned Book
Reader enters Loaned Book information
Search library if it is exist
No
Yes
Rate Book
Search/See Book's Rate
Reader enters Book information
Search library if it is exist
No
Yes
Show Book's Rate

7.6 Class Diagram:



8 Non-trivial Implementation Details:

8.1 Material:

- Meterial(Long, MetarialType, String, Category, Date, Author, Publisher,int, Situation, Location): We will use the given info to construct a Material Object.
- addRate(Integer): An user will give a rating for the metarial and this method pushes rate to the stack.

8.2 Author:

-Author(Long,String,String,String): We will use the given info to construct a Author Object.
-addBook(Material): Adds a new material to the list.
-removeBook(Material): Removes the given material from the list.

8.3 User:

-User(Long,String,String,String,Library): We will use the given info to construct a User Object.
-addMaterial(Material): Adds a new material to the list.
-searchMaterail(Material): Calls the contains() method of the list to see whether the material exist or not.
-removeMaterial(Material): Removes the given material from the list.

8.4 Publish:

-Publisher(Long,String,List¡Material¿,String): We will use the given info to construct a Publisher Object.
-addBook(Material): Adds a new material to the list.
-remove(Material): Removes the given material from the list.

8.5 PublisherRepositoryImpl:

-PublisherRepositoryImpl(): Default constructor to instantiate the object.
-remove(Publisher): Finds the given Publisher in BST. If exists, removes from the tree and rearranges the tree.
-findById(Long): Calls the find() method of BST with the given id.
-create(Publisher): Adds the given Publisher to the BST with the add() method of BST.
-findAll(): Traverses the tree and returns all the publishers in a list.
-update(Publisher): Finds the given Publisher by id and replaces it, returns the old data.

-viewInfo(Long): Finds the Publisher with the given id and if exists returns its info.

8.6 AuthorRepositoryImpl:

-AuthorRepositoryImpl(): Default constructor to instantiate the object.
-remove(Author): Finds the given Author in BST. If exists, removes from the tree and rearranges the tree.
-findById(Long): Calls the find() method of BST with the given id.
-create(Author): Adds the given Author to the BST with the add() method of BST.
-findAll(): Traverses the tree and returns all the authors in a list.
-update(Author): Finds the given Author by id and replaces it, returns the old data.
-viewInfo(Long): Finds the Author with the given id and if exists returns its info.

8.7 LibraryRepositoryImpl:

- LibraryRepositoryImpl(): Default constructor to instantiate the object.
-remove(Library): Finds the given Library in the list. If exists, removes from the list.
-findById(Long): Finds the library with the given id by doing linear search.
-create(Library): Adds the given Library to the list with the add() method of list.
-findAll():Returns all the libraries in the list.
-update(Library): Finds the given Library by id and replaces it, returns the old data.
-viewInfo(Long): Finds the Library with the given id and if exists returns its info.

8.8 MaterialRepositoryImpl:

- MaterialRepositoryImpl(): Default constructor to instantiate the object.
-remove(Material): Finds the given Material in the queue. If exists, removes from the queue.
-findById(Long): Finds the Material with the given id by calling peek() method of queue.
-create(Material): Adds the given Material to the queue. -findAll():Returns all the materials in the queue.
-update(Material): Finds the given Material by id and replaces it, returns the old data.
-viewInfo(Long): Finds Library with the given id and if exists returns its info.

8.9 AccountRepositoryImpl:

-AccountRepositoryImpl(): Default constructor to instantiate the object.
-remove(Account): Finds the given Account in BST. If exists, removes from the tree and rearranges the tree. -findById(Long): Calls the find() method of BST with the given id.
-create(Account): Adds the given Account to the BST with the add() method of BST.
-findAll(): Traverses the tree and returns all the authors in a list.
-update(Account): Finds the given Account by id and replaces it, returns the old data.
-viewInfo(Long):Finds the Account with the given id and if exists returns its info.

9 Performance Analysis:

Method / Data Type	Time Complexity	Experimental results		
		100 data	1000 data	10000 data
Material class	(1)			
setters and getters	(1)			
addRate / Stack	(1)	234 ms	262 ms	253 ms
removeRate / Stack	(1)			
compareTo	(1)			
equals	(1)			
toString	(1)			
Author class				
setters and getters	(1)			
addBook / ArrayList	O(n)	293 ms	2823 ms	29837 ms
removeBook / ArrayList	O(n)	279 ms	2937 ms	32749 ms
compareTo	(1)			
equals	(1)			
Account class				
setters and getters	(1)			
equals	(1)			
compareTo	(1)			
hashCode	(1)			
User class				
addMaterial / LinkedList	O(n)	361 ms	3721 ms	35573 ms
searchMaterial /LinkedList	O(n)	412 ms	3982 ms	39921 ms
removeMaterial /LinkedList	O(n)	372 ms	3895 ms	37459 ms
Library class				
equals	(1)			
hashCode	(1)			
compareTo	(1)			
Publisher class				
setters and getters	(1)			
addBook / ArrayList	O(n)	285 ms	3243 ms	30257 ms
remove / ArrayList	O(n)	304 ms	2935 ms	29384 ms
compareTo	(1)			
equals	(1)			
hashCode	(1)			

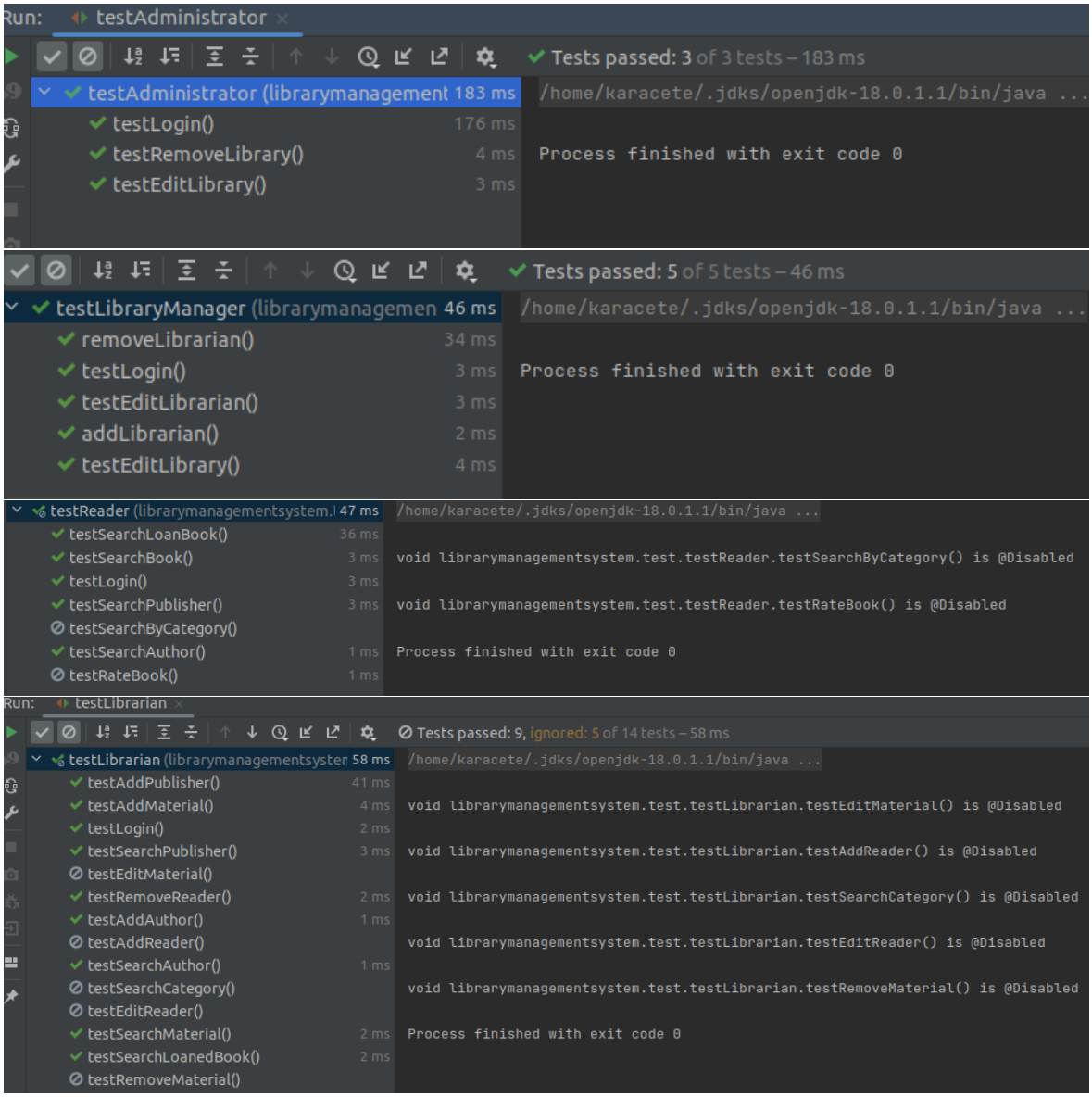
10 Test Cases:

Test Case Id	Test Case Objective	Pre Requisite	Steps	Input Data	Expect Output	Status
Test Cases For Administrator						
Admin_TC_01	Login	Admin account register or create before	1. Enter User Name 2. Enter Password	1. Admin 2. Pass	Loggin in	PASS
Admin_TC_02	Login	Admin account register or create before	1. Enter User Name 2. Enter Password	1. Admin 2. wrongPass	Wrong password or UserName	FAIL
Admin_TC_03	Remove Library	There should be a library created with this id	1. Enter Library Id	1. 1001	Library removed	PASS
Admin_TC_04	Remove Library	There should be a library created with this id	1. Enter Library Id	1. 9999	There is no library with this id	FAIL
Admin_TC_05	Edit Library	There should be a library created with this id	1. Enter Library Id	1. 1001	Library edited	PASS
Admin_TC_06	Edit Library	There should be a library created with this id	1. Enter Library Id	1. 9999	There is no library with this id	FAIL
Test Cases For Library Manager						
Manager_TC_01	Login	Library Manager account registired or create before	1. Enter User Name 2. Enter Password	1. Mngr1 2. 123Ab	Loggin in	PASS
Manager_TC_02	Login	Library Manager account registired or create before	1. Enter User Name 2. Enter Password	1. wrongUserName 2. 123Ab	Wrong password or UserName	FAIL
Manager_TC_03	Edit Library	There should be a library created with this id	1. Enter Library Id	1. 1001	Library edited	PASS
Manager_TC_04	Edit Library	There should be a library created with this id	1. Enter Library Id	1. 9999	There is no library with this id	FAIL
Manager_TC_05	Add Librarian	Librarian UserName shouldn't be used before and all required field should be filled	1. Enter User Name 2. Enter Password 3. Enter LibraryNo	1. newLibrarian 2. 123Ab 3. 1001	Librarian added	PASS
Manager_TC_06	Add Librarian	Librarian UserName shouldn't be used before and all required field should be filled	1. Enter User Name 2. Enter Password 3. Enter LibraryNo	1. Mngr1 2. 123Ab 3. 1001	User name already used	FAIL
Manager_TC_07	Add Librarian	Librarian UserName shouldn't be used before and all required field should be filled	1. Enter User Name 2. Enter Password 3. Enter LibraryNo	1. newLibrarian 2. 123Ab 3. 9999	There is no library with this id	FAIL
Manager_TC_08	Remove Librarian	There should be a librarian created with this id	1. Enter Librarian Id	1. 1001	Librarian removed	PASS
Manager_TC_09	Remove Librarian	There should be a librarian created with this id	1. Enter Librarian Id	1. 9999	There is no librarian with this id	FAIL
Manager_TC_10	Edit Librarian	There should be a librarian created with this id	1. Enter librarian Id	1. 1001	Librarian edited	PASS
Manager_TC_11	Edit Librarian	There should be a librarian created with this id	1. Enter librarian Id	1. 9999	There is no librarian with this id	FAIL
Manager_TC_12	Search Librarian	No Pre Request	1. Enter librarian Id	1. 1001	Librarian Found	PASS
Test Cases For Reader						
Reader_TC_01	Login	Reader account register or create before	1. Enter User Name 2. Enter Password	1. Reader1 2. thisReader	Loggin in	PASS
Reader_TC_01	Login	Reader account register or create before	1. Enter User Name 2. Enter Password	1. wrongUserName 2. thisReader	Wrong password or UserName	FAIL
Reader_TC_03	Rate Book	The book should be already created	1. Enter Book Id 2. Enter rate	1. 1001 2. 4.5	Book rated	PASS
Reader_TC_03	Rate Book	The book should be already created	1. Enter Book Id 2. Enter rate	1. 9999 2. 4.5	There is no book with this id	PASS
Reader_TC_04	Search Loan book	No Pre Request	1. Enter Load book id	1. 1001	Load Book searched with id	PASS
Reader_TC_05	Search Book	No Pre Request	1. Enter Book Id	1. 1001	Book searched with id	PASS
Reader_TC_06	Search Author	No Pre Request	1. Enter Author Id	1. 1001	Author searched with id	PASS
Reader_TC_07	Search Publisher	No Pre Request	1. Enter Publisher Id	1. 1001	Publisher searched with id	PASS
Reader_TC_08	Search Category	No Pre Request	1. Enter Category Id	1. 1001	Category searched with id	PASS

Test Cases For Librarian						
LibrarianTC_01	Login	Librarian account register or create before	1. Enter User Name 2. Enter Password	1. Librarian1 2. thisLibrarian	Loggin in	PASS
LibrarianTC_02	Login	Librarian account register or create before	1. Enter User Name 2. Enter Password	1. wrongUserName 2. thisLibrarian	Wrong password or UserName	FAIL
LibrarianTC_03	Add Reader	Reader UserName shouldn't be used before and all required field should be filled.	1. Enter User Name 2. Enter Password 3. Enter LibraryNo	1. newReader 2. 123Ab 3. 1001	Reader added	PASS
LibrarianTC_04	Add Reader	Reader UserName shouldn't be used before and all required field should be filled.	1. Enter User Name 2. Enter Password 3. Enter LibraryNo	1. oldReader 2. 123Ab 3. 1001	User name already used	FAIL
LibrarianTC_05	Add Reader	Reader UserName shouldn't be used before and all required field should be filled.	1. Enter User Name 2. Enter Password 3. Enter LibraryNo	1. newLibrarian 2. 123Ab 3. 9999	There is no library with this id	FAIL
LibrarianTC_06	Remove Reader	There should be a reader created with this id	1. Enter Reader Id	1. 1001	Reader removed	PASS
LibrarianTC_07	Remove Reader	There should be a reader created with this id	1. Enter Reader Id	1. 9999	There is no reader with this id	FAIL
LibrarianTC_08	Edit Reader	There should be a reader created with this id	1. Enter Reader Id	1. 1001	Reader edited	PASS
LibrarianTC_09	Edit Reader	There should be a reader created with this id	1. Enter Reader Id	1. 9999	There is no reader with this id	FAIL
LibrarianTC_10	Search Reader	No Pre Request	1. Enter Load book id	1. 1001	Reader searched with id	PASS
LibrarianTC_11	Add Metarial	Metarial id shouldn't be used before and all required field should be filled.	1. Enter Id 2. Enter Name 3. Enter CategoryId 4. Enter PublisherId 5. Enter Stuation 6. Enter PageCount 7. Enter PublicationDate 8. Enter Location 9. Enter MetarialType	1. 1001 2. Sefiller 3. 1001 4. 1001 5. STORAGE 6. 200 7. 11.04.2001 8. C3 9. Book	Book added	PASS
LibrarianTC_12	Add Metarial	Metarial id shouldn't be used before and all required field should be filled.	1. Enter Id 2. Enter Name 3. Enter CategoryId 4. Enter PublisherId 5. Enter Stuation 6. Enter PageCount 7. Enter PublicationDate 8. Enter Location 9. Enter MetarialType	1. 1002 2. Science 3. 1001 4. 1001 5. LIBRARY 6. 30 7. 06.03.2022 8. A2 9. Magazine	Magazine added	PASS
LibrarianTC_13	Add Metarial	Metarial id shouldn't be used before and all required field should be filled.	1. Enter Id 2. Enter Name 3. Enter CategoryId 4. Enter PublisherId 5. Enter Stuation 6. Enter PageCount 7. Enter PublicationDate 8. Enter Location 9. Enter MetarialType	1. 1001 2. Sefiller 3. 1001 4. 1001 5. STORAGE 6. 200 7. 11.04.2001 8. C3 9. Book	The metarial id is already using	FAIL
LibrarianTC_14	Add Metarial	Metarial id shouldn't be used before and all required field should be filled.	1. Enter Id 2. Enter Name 3. Enter CategoryId 4. Enter PublisherId 5. Enter Stuation 6. Enter PageCount 7. Enter PublicationDate 8. Enter Location 9. Enter MetarialType	1. 1001 2. Sefiller 3. 1001 4. 1001 5. STORAGE 6. 200 7. 11.04.2001 8. C3 9. Book	There is no Category and publisher with this id	FAIL
LibrarianTC_15	Remove Metarial	There should be a metarial created with this id	1. Enter metarial Id	1. 1001	Metarial removed	PASS

LibrarianTC_16	Remove Metarial	There should be a metarial created with this id	1. Enter metarial Id	1. 9999	There is no metarial with this id	FAIL
LibrarianTC_17	Edit Metarial	There should be a metarial created with this id	1. Enter metarial Id	1. 1001	Metarial edited	PASS
LibrarianTC_18	Edit Metarial	There should be a metarial created with this id	1. Enter metarial Id	1. 9999	There is no metarial with this id	FAIL
LibrarianTC_19	Search Metarial	No Pre Request	1. Enter metarial Id	1. 1001	Book searched with id	PASS
LibrarianTC_20	Add Loan Book	The book should be on library.	1. Enter Metarial Id	1. 1001	Metarial given user loggin in	PASS
LibrarianTC_21	Add Loan Book	The book should be on library.	1. Enter Metarial Id	1. 9999	There is no metarial with this id	FAIL
LibrarianTC_22	Add Loan Book	The book should be on library.	1. Enter Metarial Id	1. 1002	The Metarial is already in diffirent user	FAIL
LibrarianTC_23	Edit Loan Book	The book should be on library.	1. Enter metarial Id 2. Enter metarial stuation	1. 1001 2. LIBRARY	Metarial Stuation is changed	PASS
LibrarianTC_24	Edit Loan Book	The book should be on library.	1. Enter metarial Id 2. Enter metarial stuation	1. 9999 2. LIBRARY	There is no metarial with this id	FAIL
LibrarianTC_25	Search Loan book	No Pre Request	1. Enter Load book id	1. 1001	Loan Books searched with id	PASS
LibrarianTC_26	Add Publisher	The Published id shouldn't be used before	1. Enter Publisher Id 2. Enter Name 3. Enter Info 4. Enter Metarial List	1. 1001 2. KVK kitabevi 3. KVK kitabevi 1978 senesinde Istanbu... 4. Satranç Sefiller	Publisher is added	PASS
LibrarianTC_27	Add Publisher	The Published id shouldn't be used before	1. Enter Publisher Id 2. Enter Name 3. Enter Info 4. Enter Metarial List	1. 9999 2. Stefan Zweig 3. Stefan Zweig is born in ... 4. Satranç Amok Koşucusu	Publisher is already in system	FAIL
LibrarianTC_28	Search Publisher	No Pre Request	1. Enter Publisher Id	1. 1001	Publisher searched with id	PASS
LibrarianTC_29	Add Author	The Author id shouldn't be used before	1. Enter Author Id 2. Enter Name 3. Enter Info 4. Enter Metarial List	1. 1001 2. Stefan Zweig 3. Stefan Zweig is born in ... 4. Satranç Amok Koşucusu	Author is added	PASS
LibrarianTC_30	Add Author	The Author id shouldn't be used before	1. Enter Author Id 2. Enter Name 3. Enter Info 4. Enter Metarial List	1. 9999 2. Stefan Zweig 3. Stefan Zweig is born in ... 4. Satranç Amok Koşucusu	Author is already in system	FAIL
LibrarianTC_31	Search Author	No Pre Request	1. Enter Author Id	1. 1001	Author searched with id	PASS
LibrarianTC_32	Search Category	No Pre Request	1. Enter Category Id	1. 1001	Category searched with id	PASS

11 Result of Unit Tests:



```
================================================
|              Hello Mustafa                   |
================================================
|         1. Search materials                   |
|         2. Rate a materials                   |
|         3. Logout                             |
|         0. Exit                               |
================================================
   Choose one of the options : 1


================================================
|               Search Materials               |
================================================
|         1. List all Books and Magazines       |
|         2. Search by Name                     |
|         3. Search by Author                   |
|         4. Search by Publisher                |
|         5. Search by Category                 |
|         6. Search by Rate                     |
|         7. Back                               |
|         0. Exit                               |
================================================
   Choose one of the options : 1
================================================
|   All Materials                               |
|       0. Amok                                 |
|       1. Anne Karenina                        |
|       2. National Geographic                  |
|       3. The Metamorphosis                    |
|       4. War and Peace                        |
================================================
  Choose one of the options : 0


================================================
|               Amok                            |
================================================
|       Situation : Avaliable                   |
|       Author : Stefan                         |
|       Page : 104                              |
|       Publisher : Is Bankasi                  |
|       Category : Classics                     |
|       Lodation : A1                           |
|       Rate : 0.0                              |
|       Type : Book                             |
| On a sweltering ocean-liner travelling from   |
|India to Europe a passenger tells his story:   |
|the tale of a doctor in the Dutch East Indies  |
|torn between his duty and the pull of his      |
|emotions; a tale of power and desire, pride and|
|shame and a headlong flight into folly.        |
================================================
  Press any key and Enter to go back :
```