Library Management System Project Summary Report

1. Project Information

- Student Name: Halil Teoman Abanoz

- Student Number: 20220305303

- Project Name: Library Management System

- Github Address: https://github.com/teomanabanoz/Proje

2. Project Description

This project is a desktop application developed to manage the basic operations of a library. It includes core library functions such as book and member management, borrowing operations, and reporting.

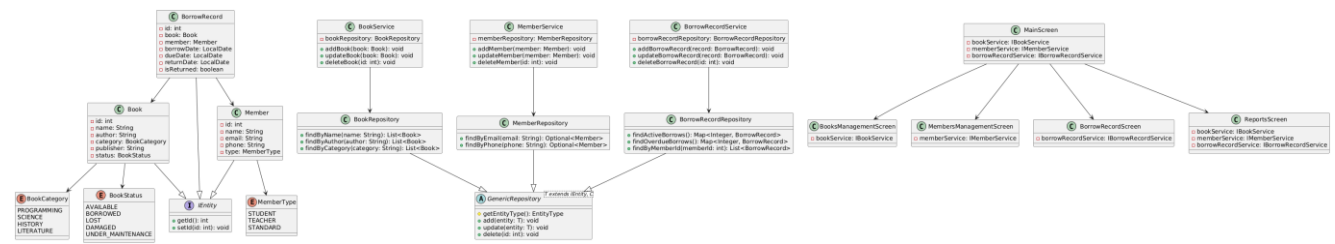## 3. General System Architecture

a) Use Case Diagram
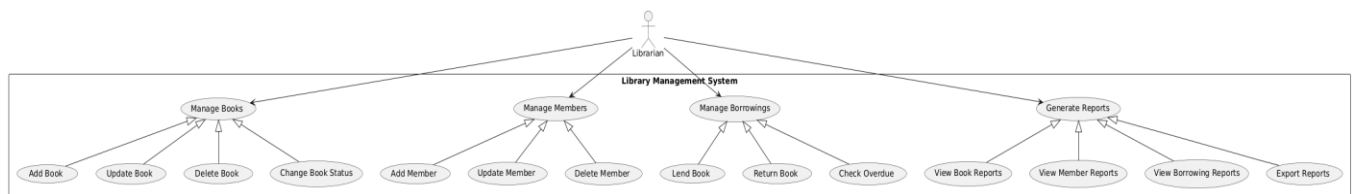
Main system functions:

- Book Management (Add, Delete, Update)

- Member Management (Add, Delete, Update)

- Borrowing Operations (Lending, Returning)

- Reporting

b) Class Diagram

Core system components:

- Domain Models: Book, Member, BorrowRecord

- Services: BookService, MemberService, BorrowRecordService

- Repositories: BookRepository, MemberRepository, BorrowRecordRepository

- UI Classes: MainScreen, BooksManagementScreen, MembersManagementScreen, BorrowRecordScreen, ReportsScreen

c) Layered Architecture

- Presentation Layer (UI): User interfaces and screen management

- Business Layer (Service): Business logic and validation rules

- Data Layer (Repository): Data access and storage operations

4. Software Design Details

a) Inheritance

- Specialized repository classes derived from GenericRepository

- Interface implementations in entity classes

b) Interface

- IBookService, IMemberService: Service layer operations

- IEntity: Basic entity properties

c) Polymorphism

- Service access through interfaces

- Generic repository usage

- Entity management polymorphism

d) Generic Class/Method

- GenericRepository: Generic structure for basic CRUD operations

- Generic method usage in service classes

e) Generic Collections

- List: Management of book and member lists

- Map: Management of borrowing records

- Set: Management of unique records

f) Lambda Functions

- Data filtering with Stream API

- Event handler definitions

- Lambda usage in collection operations

5. Conclusion

This project is a comprehensive library management system developed using modern features of the Java programming language. The system, developed using layered architecture and design patterns, has an extensible and maintainable structure. All project requirements have been successfully implemented and tested.