**1. Activity Diagram:**

mermaid

Salin kode

%% Activity Diagram for Library System

flowchart TD

Start --> SearchBooks{Search for Books?}

SearchBooks -- Yes --> DisplayResults

SearchBooks -- No --> End

DisplayResults --> ChooseBook{Choose a Book?}

ChooseBook -- Yes --> BorrowProcess

BorrowProcess --> End

ChooseBook -- No --> End

BorrowProcess --> CheckMembership{Valid Membership?}

CheckMembership -- Yes --> IssueBook

IssueBook --> End

CheckMembership -- No --> End

**2. Use Case Diagram:**

mermaid

Salin kode

%% Use Case Diagram for Library System

%% Roles: Librarian, Member

%% Use Cases: Search Books, Borrow Book, Return Book, Manage Catalog

classDiagram

class LibrarySystem {

SearchBooks()

BorrowBook()

ReturnBook()

ManageCatalog()

}

class Member {

<<Actor>>

}

class Librarian {

<<Actor>>

}

Member --> LibrarySystem : "Search Books"

Member --> LibrarySystem : "Borrow Book"

Member --> LibrarySystem : "Return Book"

Librarian --> LibrarySystem : "Manage Catalog"

**3. Class Diagram:**

mermaid

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%% Class Diagram for Library System

classDiagram

class Book {

String title

String author

int ISBN

bool isAvailable

borrow()

returnBook()

}

class Member {

String name

String memberId

String email

borrowBook(Book)

returnBook(Book)

}

class Librarian {

String name

manageCatalog()

}

class Catalog {

searchBook(String title)

addBook(Book)

removeBook(Book)

}

Member --> Book : borrows

Librarian --> Catalog : manages

Catalog --> Book : contains

**4. State Diagram:**

mermaid

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%% State Diagram for Book in Library System

stateDiagram

[\*] --> Available

Available --> Borrowed : Borrow Book

Borrowed --> Available : Return Book

Available --> Reserved : Reserve Book

Reserved --> Borrowed : Borrow Book

Reserved --> Available : Cancel Reservation

**5. Sequence Diagram:**

mermaid

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%% Sequence Diagram for Borrowing Book in Library System

sequenceDiagram

participant Member

participant Catalog

participant Librarian

participant Book

Member->>Catalog: Search for Book

Catalog->>Member: Display Book List

Member->>Librarian: Request to Borrow Book

Librarian->>Book: Check Availability

Book-->>Librarian: Available

Librarian->>Member: Approve Request

Librarian->>Book: Update Status to Borrowed

**6. Component Diagram**

graph TB

User -- Request --> Interface

Interface -- Check --> Catalogue

Catalogue -- Check --> Inventory

Inventory -- Respond --> Catalogue

Catalogue -- Update --> Interface

Interface -- Issue --> Notification

Interface -- Forward --> Database