# Logical Relational Schema Design

## Introduction

Project Overview

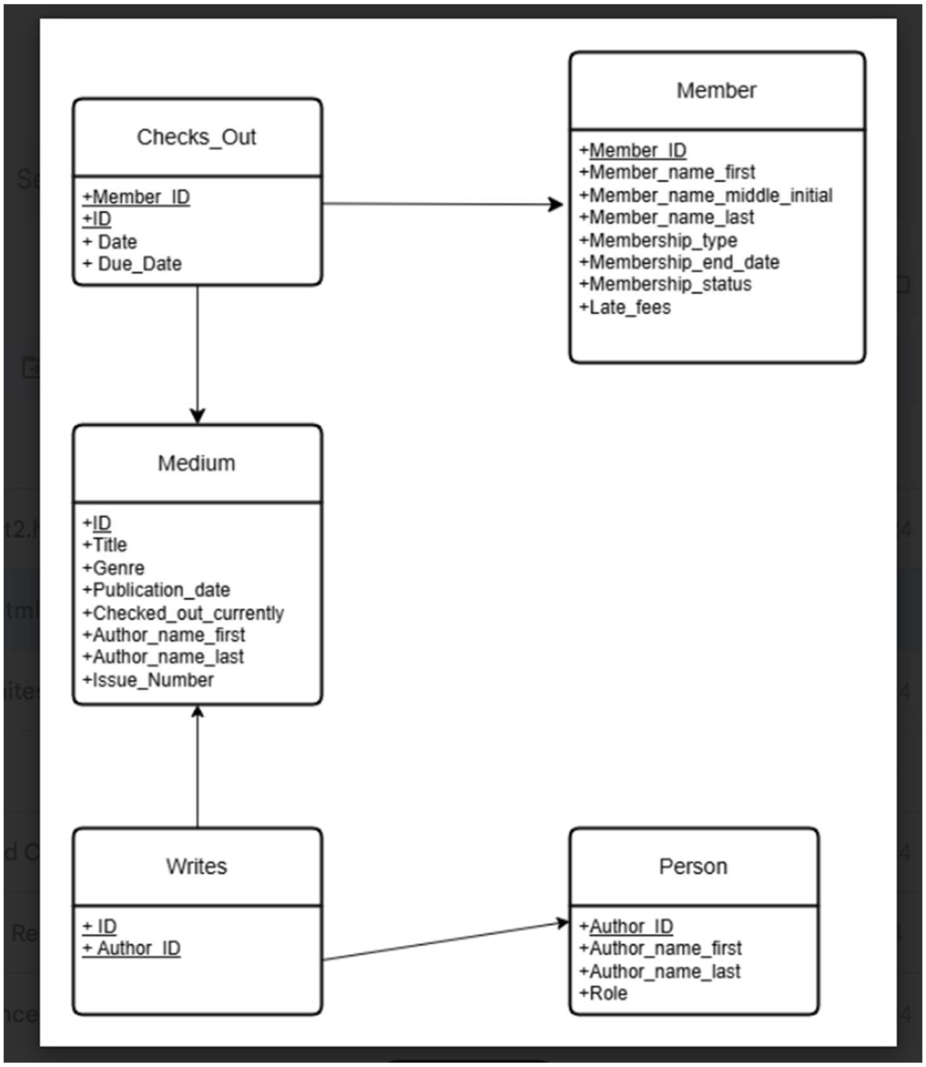
This database is intended to track the memberships and various media that a given library may store. This should include which items are checked out, for how long, what is overdue, any fees charged to members, and other important details about items available.

Scope

The database will not track the content or condition of every item. It will track the availability of certain items, and the membership fees associated with a client account.

## Schema Documentation

Relational Diagram



## Data Dictionary

### Member

| Attribute | Datatype | Domain | Constraints |
|---|---|---|---|
| Member_ID | int | A positive integer | Primary key |
| Member_name_first | varchar | A string consisting of 15 characters | Not null |
| Member_name_middle_initial | char | A single character | Null allowed |
| Member_name_last | varchar | A string consisting of 15 characters | Not null |
| Membership_type | varchar | A string consisting of 7 characters | Not null |
| Membership_end_date | date | A calendar date | |
| Membership_status | varchar | A string consisting of 8 characters | Not null |
| Late_fees | int | A positive integer | Not null |

### Medium

| Attribute | Datatype | Domain | Constraints |
|---|---|---|---|
| ID | int | A positive integer | Primary key |
| Title | varchar | A string consisting of 100 characters | Not null |
| Genre | varchar | A string consisting of 50 characters | Not null |
| Publication_date | date | A calendar date | Not null |
| Checked_out_currently | varchar | A string of 3 characters “yes” or “no” | Not null |
| Issue_number | Int | A positive integer | |

### Checks Out (relationship between Member and Medium)

| Attribute | Datatype | Domain | Constraints |
|---|---|---|---|
| Member_ID | int | A positive integer | Primary Key, Foreign key (Member) |
| Medium_ID | int | A positive integer | Primary Key, Foreign key (Medium) |
| Checkout_date | date | A calendar date | Not null |
| Due_date | date | A calendar date | Not null |

### Person

| Attribute | Datatype | Domain | Constraints |
|---|---|---|---|
| Author_ID | int | A positive integer | Primary key |
| Author_name_first | varchar | A string consisting of 50 characters | Not null |
| Author_name_last | varchar | A string consisting of 50 characters | Not null |
| Creator_role | varchar | A string consisting of 10 characters | Not null |

### Writes (relationship between Author and Book)

| Attribute | Datatype | Domain | Constraints |
|---|---|---|---|
| Author_ID | int | A positive integer | Primary key, Foreign key (Author) |
| Book_ID | int | A positive integer | Primary key, Foreign key (Book) |

| Directs (relationshp between<br>Director and Media) | | | |
|---|---|---|---|
| Attribute | Datatype | Domain | Constraints |
| Director_ID | int | A positive integer | Primary key, Foreign key (Person) |
| Media_ID | int | A positive integer | Primary key, Foreign key (Medium) |

Generated DDL

```
CREATE TABLE Member (
        Member_ID INT NOT NULL,
        Member_name_first VARCHAR (15) NOT NULL,
        Member_name_middle_initial CHAR,
        Member_name_last VARCHAR (15) NOT NULL,
        Membership_type VARCHAR(7) NOT NULL,
        Membership_end_date DATE,
        Membership_status VARCHAR(8) NOT NULL,
        Number_of_items_checked_out INT NOT NULL,
        Late_fees INT NOT NULL,
        PRIMARY KEY (Member_ID),
        CHECK (Late_fees >= 0),
        CHECK (Number_of_items_checked_out >= 0),
        CHECK (Membership_status=”active” OR Membership_status=”inactive”),
        CHECK (Membership_type=”senior” OR Membership_type=”student” OR
        Membership_type=”child” OR Membership_type=”adult”)
);
CREATE TABLE Medium (
        ID INT NOT NULL,
        Title VARCHAR(100) NOT NULL,
        Genre VARCHAR(50) NOT NULL,
        Publication_date DATE NOT NULL,
        Checked_out_currently VARCHAR(3) NOT NULL,
        CHECK (Checked_out_currently=”yes” OR Checked_out_currently=”no”)
);
CREATE TABLE Checks Out (
        Member_ID INT NOT NULL,
        Medium_ID INT NOT NULL,
        Checkout_date DATE NOT NULL,
        Due_date DATE NOT NULL,
        PRIMARY KEY (Member_ID, Medium_ID)
        FOREIGN KEY (Member_ID) REFERENCES Member
        FOREIGN KEY (Medium_ID) REFERENCES Medium
);
CREATE TABLE Magazine (
        ID INT NOT NULL,
        Issue_number INT NOT NULL,
        PRIMARY KEY (ID),
        FOREIGN KEY (ID) REFERENCES Medium
);
CREATE TABLE Author (
        Author_ID INT NOT NULL,
        Author_first_name VARCHAR(50) NOT NULL,
        Author_last_name VARCHAR(50) NOT NULL,
        PRIMARY KEY (Author_ID)
);
CREATE TABLE Writes (
        Author_ID INT NOT NULL,
        Book_ID INT NOT NULL,
        PRIMARY KEY (Author_ID, Book_ID),
        FOREIGN KEY (Author_ID) REFERENCES Author,
        FOREIGN KEY (Book_ID) REFERENCES Medium
);
CREATE TABLE Director (
        Director_ID INT NOT NULL,
        Director_name_first VARCHAR(50) NOT NULL,
        Director_name_last VARCHAR(30) NOT NULL,
        PRIMARY KEY (Director_ID)
);
CREATE TABLE Directs (
        Director_ID INT NOT NULL,
        Media_ID INT NOT NULL,
        PRIMARY KEY (Director_ID, Media_ID),
        FOREIGN KEY (Director_ID) REFERENCES Director
        FOREIGN KEY (Media_ID) REFERENCES Medium
```