

Assignment-2

Name: Boyapati Durgamallikarjuna

RPS UserID: 21951

Assignment 2: Design a database schema for a library system, including tables, fields, and constraints like NOT NULL, UNIQUE, and CHECK. Include primary and foreign keys to establish relationships between tables.

Creating the library system database and authors' table:

```
mysql> use library_sys;
Database changed
mysql> CREATE TABLE Authors (
  ->   AuthorID INT AUTO_INCREMENT PRIMARY KEY,
  ->   FirstName VARCHAR(50) NOT NULL,
  ->   LastName VARCHAR(50) NOT NULL,
  ->   UNIQUE (FirstName, LastName)
  -> );
Query OK, 0 rows affected (0.06 sec)

mysql> desc authors;
+-----+-----+-----+-----+-----+-----+
| Field      | Type          | Null | Key | Default | Extra          |
+-----+-----+-----+-----+-----+-----+
| AuthorID   | int           | NO   | PRI | NULL    | auto_increment |
| FirstName  | varchar(50)   | NO   | MUL | NULL    |                 |
| LastName   | varchar(50)   | NO   |     | NULL    |                 |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.01 sec)
```

- Holds information about authors.
- AuthorID: Primary key.
- FirstName and LastName: Combined as unique to avoid duplicate author entries.

Creating Books table:

```
mysql> CREATE TABLE Books (
  ->   BookID INT AUTO_INCREMENT PRIMARY KEY,
  ->   Title VARCHAR(255) NOT NULL,
  ->   ISBN VARCHAR(13) UNIQUE NOT NULL,
  ->   PublishedYear YEAR NOT NULL,
  ->   Genre VARCHAR(50),
  ->   AuthorID INT NOT NULL,
  ->   CopiesAvailable INT NOT NULL CHECK (CopiesAvailable >= 0),
  ->   FOREIGN KEY (AuthorID) REFERENCES Authors(AuthorID)
  -> );
Query OK, 0 rows affected (0.06 sec)

mysql> desc books;
+-----+-----+-----+-----+-----+-----+
| Field          | Type          | Null | Key | Default | Extra          |
+-----+-----+-----+-----+-----+-----+
| BookID         | int           | NO   | PRI | NULL    | auto_increment |
| Title          | varchar(255)  | NO   |     | NULL    |                 |
| ISBN           | varchar(13)   | NO   | UNI | NULL    |                 |
| PublishedYear  | year          | NO   |     | NULL    |                 |
| Genre          | varchar(50)   | YES  |     | NULL    |                 |
| AuthorID       | int           | NO   | MUL | NULL    |                 |
| CopiesAvailable | int           | NO   |     | NULL    |                 |
+-----+-----+-----+-----+-----+-----+
7 rows in set (0.00 sec)
```

- Contains details about the books in the library.
- ISBN: Unique identifier for books.
- AuthorID: Foreign key linking to Authors.
- CopiesAvailable: Ensures books available for loan are non-negative.

Creating the Publishers Table:

```
mysql> CREATE TABLE Publishers (
-> PublisherID INT AUTO_INCREMENT PRIMARY KEY,
-> Name VARCHAR(100) NOT NULL UNIQUE,
-> Address TEXT NOT NULL,
-> ContactNumber VARCHAR(15)
-> );
Query OK, 0 rows affected (0.04 sec)

mysql> desc publishers;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| PublisherID | int | NO | PRI | NULL | auto_increment |
| Name | varchar(100) | NO | UNI | NULL | |
| Address | text | NO | | NULL | |
| ContactNumber | varchar(15) | YES | | NULL | |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)

mysql> ALTER TABLE Books
-> ADD COLUMN PublisherID INT,
-> ADD FOREIGN KEY (PublisherID) REFERENCES Publishers(PublisherID);
Query OK, 0 rows affected (0.12 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> ADD COLUMN PublisherID INT,
-> ^C
mysql> desc publishers;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| PublisherID | int | NO | PRI | NULL | auto_increment |
| Name | varchar(100) | NO | UNI | NULL | |
| Address | text | NO | | NULL | |
| ContactNumber | varchar(15) | YES | | NULL | |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

- Stores publisher details.
- PublisherID: Primary key.
- Name: Unique to ensure no duplicate publisher names.