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.**

Solution :

- **Schema for a library system:**

1. **Table: Authors**
   - Fields:
     - author_id (Primary Key)
     - author_name
     - author_birthdate
     - author_country
2. **Table: Books**
   - Fields:
     - book_id (Primary Key)
     - title
     - publication_year
     - isbn (UNIQUE)
     - author_id (Foreign Key referencing Authors)
3. **Table: Members**
   - Fields:
     - member_id (Primary Key)
     - member_name
     - member_address
     - member_phone
4. **Table: Loans**
   - Fields:
     - loan_id (Primary Key)
     - book_id (Foreign Key referencing Books)
     - member_id (Foreign Key referencing Members)
     - loan_date
     - return_date
5. **Table: Genres**
   - Fields:
     - genre_id (Primary Key)
     - genre_name
6. **Table: Book_Genres**
   - Fields:
     - book_id (Foreign Key referencing Books)
     - genre_id (Foreign Key referencing Genres)
     - CONSTRAINT PK_Book_Genres PRIMARY KEY (book_id, genre_id)

Constraints:

- **NOT NULL**: Ensure that essential fields like author_name, title, publication_year, member_name, etc., cannot be empty.
- **UNIQUE**: ISBN should be unique for each book.
- **CHECK**: Check constraints can be applied to ensure that certain conditions are met. For instance, ensuring that publication_year is within a reasonable range.
- **Primary Keys**: Each table should have a primary key, which uniquely identifies each record.
- **Foreign Keys**: These establish relationships between tables. For instance, the author_id in Books references the author_id in Authors, indicating the author of the book. Similarly, the book_id and member_id in Loans reference the respective tables, showing which book is loaned by which member.