

## Assignment 2

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.

Ans:

```
use vijaydb;
```

```
CREATE TABLE Books (
```

```
    BookID INT AUTO_INCREMENT PRIMARY KEY,
```

```
    Title VARCHAR(255) NOT NULL,
```

```
    Author VARCHAR(255) NOT NULL,
```

```
    ISBN VARCHAR(20) NOT NULL UNIQUE
```

```
);
```

```
INSERT INTO Books (Title, Author, ISBN) VALUES
```

```
('1984', 'George Orwell', '9780451524935'),
```

```
('To Kill a Mockingbird', 'Harper Lee', '9780061120084'),
```

```
('Pride and Prejudice', 'Jane Austen', '9781503290563');
```

```
drop table books;
```

```
CREATE TABLE Borrowers (
```

```
    BorrowerID INT AUTO_INCREMENT PRIMARY KEY,
```

```
    FirstName VARCHAR(255) NOT NULL,
```

```
    LastName VARCHAR(255) NOT NULL,
```

```
Email VARCHAR(255) UNIQUE,  
PhoneNumber VARCHAR(15),  
RegistrationDate DATE NOT NULL  
);
```

```
INSERT INTO Borrowers (FirstName, LastName, Email,  
PhoneNumber, RegistrationDate) VALUES  
( 'John', 'Doe', 'john.doe@example.com', '1234567890', '2022-01-  
01'),  
( 'Jane', 'Smith', 'jane.smith@example.com', '0987654321', '2022-02-  
15'),  
( 'Emily', 'Johnson', 'emily.j@example.com', '1122334455', '2022-03-  
20');
```

```
CREATE TABLE Loans (  
    LoanID INT AUTO_INCREMENT PRIMARY KEY,  
    BookID INT NOT NULL,  
    BorrowerID INT NOT NULL,  
  
    FOREIGN KEY (BookID) REFERENCES Books(BookID),  
    FOREIGN KEY (BorrowerID) REFERENCES Borrowers(BorrowerID)  
);
```

```
INSERT INTO Loans (BookID, BorrowerID) VALUES  
(1, 1 ), -- Book 1 loaned to Borrower 1, not yet returned  
(2, 2 ), -- Book 2 loaned to Borrower 2, returned
```

(1, 3); -- Book 1 loaned again to Borrower 3, not yet returned

select \* from loans;

select \* from borrowers;

select \* from books;

The screenshot shows the MySQL Workbench interface. The SQL Editor contains the following queries:

```
32 FOREIGN KEY (BookID) REFERENCES Books(BookID),
33 FOREIGN KEY (BorrowerID) REFERENCES Borrowers(BorrowerID)
34 );
35
36 INSERT INTO Loans (BookID, BorrowerID) VALUES
37 (1, 1), -- Book 1 loaned to Borrower 1, not yet returned
38 (2, 2), -- Book 2 loaned to Borrower 2, returned
39 (1, 3); -- Book 1 loaned again to Borrower 3, not yet returned
40
41 select * from loans;
```

The Results Grid shows the output of the last query:

LoanID	BookID	BorrowerID
1	1	1
2	2	2
3	1	3

The Output tab shows the execution log:

#	Time	Action	Message	Duration / Fetch
10	21:34:13	INSERT INTO Borrowers (FirstName, LastName, Email, PhoneNumber, RegistrationDate) VALUES ('John', 'Doe', 'john.doe@example.com', '1234567890', '2023-01-01')	3 row(s) affected Records: 3 Duplicates: 0 Warnings: 0	0.032 sec
11	21:35:40	INSERT INTO Loans (BookID, BorrowerID) VALUES (1, 1), -- Book 1 loaned to Borrower 1, not yet returned (...)	3 row(s) affected Records: 3 Duplicates: 0 Warnings: 0	0.016 sec
12	21:37:16	select * from loans LIMIT 0, 1000	3 row(s) returned	0.000 sec / 0.000 sec
13	21:38:24	select * from loans first_name LIMIT 0, 1000	Error Code: 1049, Unknown database 'loans'	0.000 sec
14	21:39:21	select * from borrowers LIMIT 0, 1000	3 row(s) returned	0.000 sec / 0.000 sec
15	21:43:04	select * from loans LIMIT 0, 1000	3 row(s) returned	0.000 sec / 0.000 sec

MySQL Workbench

Local instance MySQL (vjaydb) x Local instance MySQL (vjaydb) x

File Edit View Query Database Server Tools Scripting Help

Navigator

SCHEMAS

Filter objects

sys

vjay

Tables

bonus

customers

dept

emp

orders

product

salgrade

Views

Stored Procedures

Functions

vjaydb

Tables

Views

Stored Procedures

Functions

wiprodb

Administration Schemas

Information

No object selected

SQL File 11\*

FOREIGN KEY (BorrowerID) REFERENCES Borrowers(BorrowerID)

});

INSERT INTO Loans (BookID, BorrowerID) VALUES

(1, 1), -- Book 1 loaned to Borrower 1, not yet returned

(2, 2), -- Book 2 loaned to Borrower 2, returned

(1, 3), -- Book 1 loaned again to Borrower 3, not yet returned

select \* from loans;

select \* from borrowers;

select \* from books;

Result Grid

BookID	Title	Author	ISBN
1	1984	George Orwell	9780451524935
2	To Kill a Mockingbird	Harper Lee	9780061120084
3	Pride and Prejudice	Jane Austen	9781503290563

books 5 x

Output

Action Output

#	Time	Action	Message	Duration / Fetch
12	21:37:16	select * from loans LIMIT 0, 1000	3 row(s) returned	0.000 sec / 0.000 sec
13	21:38:24	select * from loans.firstname LIMIT 0, 1000	Error Code: 1049. Unknown database 'loans'	0.000 sec
14	21:39:21	select * from borrowers LIMIT 0, 1000	3 row(s) returned	0.000 sec / 0.000 sec
15	21:43:04	select * from loans LIMIT 0, 1000	3 row(s) returned	0.000 sec / 0.000 sec
16	21:43:14	select * from borrowers LIMIT 0, 1000	3 row(s) returned	0.000 sec / 0.000 sec
17	21:43:40	select * from books LIMIT 0, 1000	3 row(s) returned	0.000 sec / 0.000 sec

Object Info Session

MySQL Workbench

Local instance MySQL (vjaydb) x Local instance MySQL (vjaydb) x

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vjaydb

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Views

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wiprodb

Administration Schemas

Information

No object selected

SQL File 11\*

FOREIGN KEY (BookID) REFERENCES Books(BookID),

Execute the selected portion of the script or everything, if there is no selection

});

INSERT INTO Loans (BookID, BorrowerID) VALUES

(1, 1), -- Book 1 loaned to Borrower 1, not yet returned

(2, 2), -- Book 2 loaned to Borrower 2, returned

(1, 3), -- Book 1 loaned again to Borrower 3, not yet returned

select \* from loans;

select \* from borrowers;

Result Grid

BorrowerID	Firstname	Lastname	Email	PhoneNumber	RegistrationDate
1	John	Doe	john.doe@example.com	1234567890	2022-01-01
2	Jane	Smith	jane.smith@example.com	0987654321	2022-02-15
3	Emily	Johnson	emily.j@example.com	1122334455	2022-03-20

borrowers 4 x

Output

Action Output

#	Time	Action	Message	Duration / Fetch
11	21:35:40	INSERT INTO Loans (BookID, BorrowerID) VALUES (1, 1), -- Book 1 loaned to Borrower 1, not yet returned (...)	3 row(s) affected Records: 3 Duplicates: 0 Warnings: 0	0.016 sec
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14	21:39:21	select * from borrowers LIMIT 0, 1000	3 row(s) returned	0.000 sec / 0.000 sec
15	21:43:04	select * from loans LIMIT 0, 1000	3 row(s) returned	0.000 sec / 0.000 sec
16	21:43:14	select * from borrowers LIMIT 0, 1000	3 row(s) returned	0.000 sec / 0.000 sec

Object Info Session

