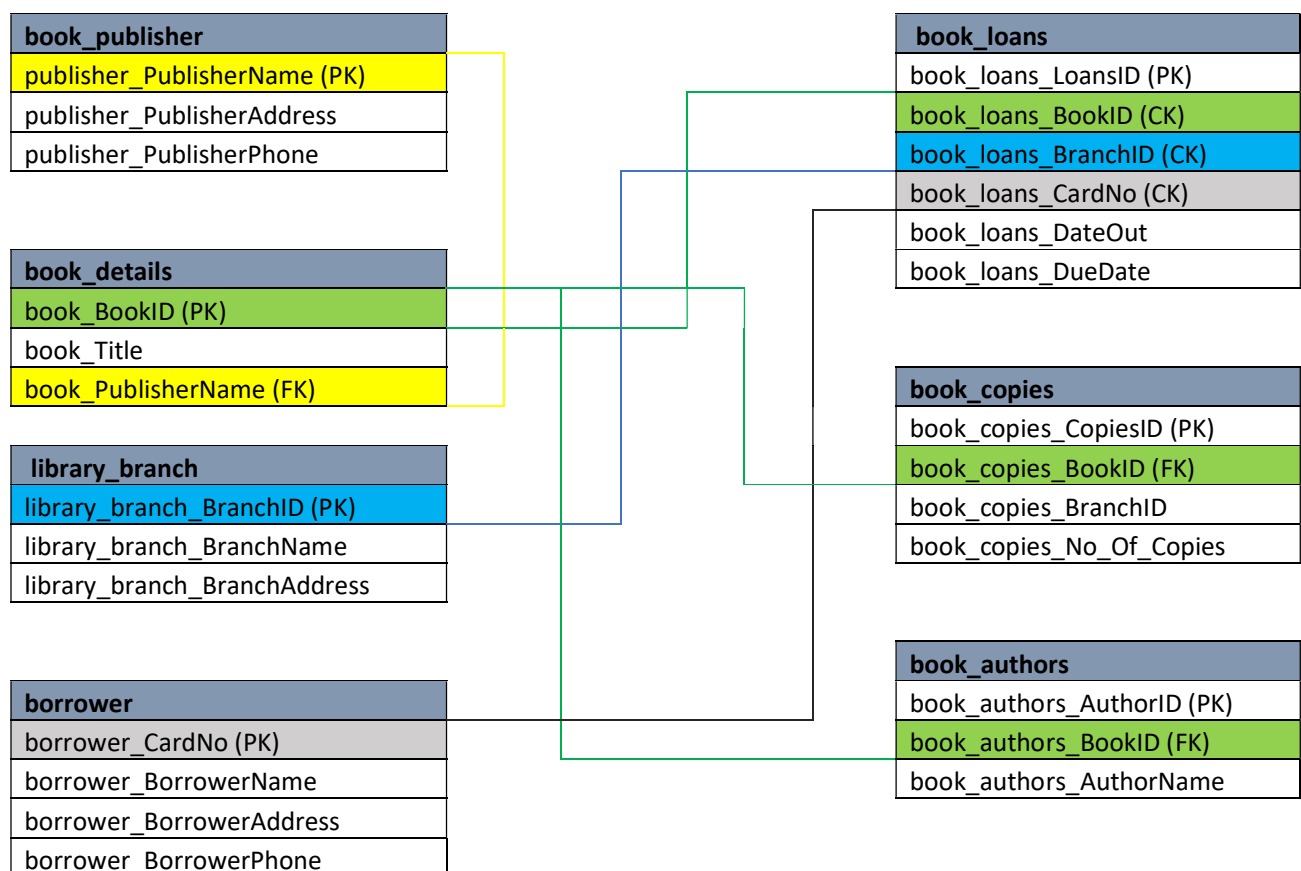# Library Management System

ABSTRACT
This project is to create a library management system that is capable to issue books and let consumers check different books and their titles categorically.

Introduction

The concept behind this project is to create a library management system that is capable to issue books and let consumers check different books and their titles categorically. It keeps track of all the details about the books in the library, their price, status, and the total number of books available in the Library. The user will find this automated system easy instead of using the manual writing system.

ER Diagram

book_publisher
publisher_PublisherName (PK)
publisher_PublisherAddress
publisher_PublisherPhone

book_details
book_BookID (PK)
book_Title
book_PublisherName (FK)

library_branch
library_branch_BranchID (PK)
library_branch_BranchName
library_branch_BranchAddress

borrower
borrower_CardNo (PK)
borrower_BorrowerName
borrower_BorrowerAddress
borrower_BorrowerPhone

book_loans
book_loans_LoansID (PK)
book_loans_BookID (CK)
book_loans_BranchID (CK)
book_loans_CardNo (CK)
book_loans_DateOut
book_loans_DueDate

book_copies
book_copies_CopiesID (PK)
book_copies_BookID (FK)
book_copies_BranchID
book_copies_No_Of_Copies

book_authors
book_authors_AuthorID (PK)
book_authors_BookID (FK)
book_authors_AuthorName

Database Design

Database: LibraryManagementSystem

Tables :

1. book_publisher
2. book_authors
3. book_copies
4. book_details
5. book_loans
6. borrower
7. library_branch

Database creation

```
# mysql -u root
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 8
Server version: 10.4.28-MariaDB mariadb.org binary distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> create database sql_project;
Query OK, 1 row affected (0.001 sec)

MariaDB [(none)]> use database sql_project;
ERROR 1049 (42000): Unknown database 'database'
MariaDB [(none)]> use sql_project;
Database changed
```

Table Creation

1. Book_publisher table

```
MariaDB [sql_project]> CREATE TABLE book_publisher (
    -> publisher_PublisherName VARCHAR(100) PRIMARY KEY NOT NULL,
    -> publisher_PublisherAddress VARCHAR(200) NOT NULL,
    -> publisher_PublisherPhone VARCHAR(50) NOT NULL
    -> );
Query OK, 0 rows affected (0.019 sec)
```

2. library_brach table

```
MariaDB [sql_project]> CREATE TABLE library_branch (
    -> library_branch_BranchID INT PRIMARY KEY,
    -> library_branch_BranchName VARCHAR(100) NOT NULL,
    -> library_branch_BranchAddress VARCHAR(200) NOT NULL
    -> );
Query OK, 0 rows affected (0.013 sec)
```

3. book_details table

```
MariaDB [sql_project]> CREATE TABLE book_details (
    -> book_BookID INT PRIMARY KEY ,
    -> book_Title VARCHAR(100) NOT NULL,
    -> book_PublisherName VARCHAR(100) NOT NULL
    -> );
Query OK, 0 rows affected (0.022 sec)
```

4. borrower table

```
MariaDB [sql_project]> CREATE TABLE borrower (
    -> borrower_CardNo INT PRIMARY KEY NOT NULL ,
    -> borrower_BorrowerName VARCHAR(100) NOT NULL,
    -> borrower_BorrowerAddress VARCHAR(200) NOT NULL,
    -> borrower_BorrowerPhone VARCHAR(50) NOT NULL
    -> );
Query OK, 0 rows affected (0.022 sec)
```

5. book_loans table

```
MariaDB [sql_project]> CREATE TABLE book_loans (
    -> book_loans_LoansID INT PRIMARY KEY NOT NULL,
    -> book_loans_BookID INT NOT NULL ,
    -> book_loans_BranchID INT NOT NULL ,
    -> book_loans_CardNo INT NOT NULL ,
    -> book_loans_DateOut VARCHAR(50) NOT NULL,
    -> book_loans_DueDate VARCHAR(50) NOT NULL
    -> );
Query OK, 0 rows affected (0.013 sec)
```

6. book_copies tables

```
MariaDB [sql_project]> CREATE TABLE book_copies (
    -> book_copies_CopiesID INT PRIMARY KEY NOT NULL ,
    -> book_copies_BookID INT NOT NULL,
    -> book_copies_BranchID INT NOT NULL ,
    -> book_copies_No_Of_Copies INT NOT NULL
    -> );
Query OK, 0 rows affected (0.013 sec)
```

7. book_authors table

```
MariaDB [sql_project]> CREATE TABLE book_authors (
    -> book_authors_AuthorID INT PRIMARY KEY NOT NULL ,
    -> book_authors_BookID INT NOT NULL ,
    -> book_authors_AuthorName VARCHAR(50) NOT NULL
    -> );
Query OK, 0 rows affected (0.014 sec)
```

Tables in database

```
MariaDB [sql_project]> show tables;
+-----------------------+
| Tables_in_sql_project |
+-----------------------+
| book_authors          |
| book_copies           |
| book_details          |
| book_loans            |
| book_publisher        |
| book_publisher_view   |
| borrower              |
| library_branch        |
| users                 |
+-----------------------+
9 rows in set (0.003 sec)
```

Data Defination Langauge

Created tables

Ex:

```
MariaDB [sql_project]> desc  book_details;
+--------------------+--------------+------+-----+---------+-------+
| Field              | Type         | Null | Key | Default | Extra |
+--------------------+--------------+------+-----+---------+-------+
| book_BookID        | int(11)      | NO   | PRI | NULL    |       |
| book_Title         | varchar(100) | NO   |     | NULL    |       |
| book_PublisherName | varchar(100) | NO   | MUL | NULL    |       |
+--------------------+--------------+------+-----+---------+-------+
3 rows in set (0.033 sec)
```

Alter Table add constraint

```
MariaDB [sql_project]> alter table book_details add constraint foreign key(book_PublisherName) references book_publisher(publisher_PublisherName);
Query OK, 20 rows affected (0.073 sec)
Records: 20  Duplicates: 0  Warnings: 0

MariaDB [sql_project]> desc book_details;
+--------------------+--------------+------+-----+---------+-------+
| Field              | Type         | Null | Key | Default | Extra |
+--------------------+--------------+------+-----+---------+-------+
| book_BookID        | int(11)      | NO   | PRI | NULL    |       |
| book_Title         | varchar(100) | NO   |     | NULL    |       |
| book_PublisherName | varchar(100) | NO   | MUL | NULL    |       |
+--------------------+--------------+------+-----+---------+-------+
```

```
MariaDB [sql_project]> alter table book_loans add constraint foreign key(book_loans_BookID) references book_details(book_BookID);
Query OK, 18 rows affected (0.133 sec)
Records: 18  Duplicates: 0  Warnings: 0

MariaDB [sql_project]>
MariaDB [sql_project]> alter table book_loans add constraint foreign key(book_loans_BranchID) references library_branch(library_branch_BranchID)
Query OK, 18 rows affected (0.074 sec)
Records: 18  Duplicates: 0  Warnings: 0
```

```
MariaDB [sql_project]> alter table borrower change borrower_BorrowerName Borrower_Name VARCHAR(100);
Query OK, 0 rows affected (0.061 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [sql_project]> --Change datatype of book_loans_DateOut to VARCHAR(100)--
MariaDB [sql_project]> alter table book_loans modify book_loans_DateOut VARCHAR(100);
Query OK, 18 rows affected (0.068 sec)
Records: 18  Duplicates: 0  Warnings: 0
```

Data Manipulation Language

Insert into table

Ex:

```
MariaDB [sql_project]> INSERT INTO book_publisher
    -> (publisher_PublisherName, publisher_PublisherAddress, publisher_PublisherPhone)
    -> VALUES
    -> ('DAW Books','375 Hudson Street, New York, NY 10014','212-366-2000'),
    -> ('Viking','375 Hudson Street, New York, NY 10014','212-366-2000'),
    -> ('Signet Books','375 Hudson Street, New York, NY 10014','212-366-2000'),
    -> ('Chilton Books','Not Available','Not Available'),
    -> ('George Allen & Unwin','83 Alexander Ln, Crows Nest NSW 2065, Australia','+61-2-8425-0100'),
    -> ('Alfred A. Knopf','The Knopf Doubleday Group Domestic Rights, 1745 Broadway, New York, NY 10019','212-940-7390'),
    -> ('Bloomsbury','Bloomsbury Publishing Inc., 1385 Broadway, 5th Floor, New York, NY 10018','212-419-5300'),
    -> ('Shinchosa','Oga Bldg. 8, 2-5-4 Sarugaku-cho, Chiyoda-ku, Tokyo 101-0064 Japan','+81-3-5577-6507'),
    -> ('Harper and Row','HarperCollins Publishers, 195 Broadway, New York, NY 10007','212-207-7000'),
    -> ('Pan Books','175 Fifth Avenue, New York, NY 10010','646-307-5745'),
    -> ('Chalto & Windus','375 Hudson Street, New York, NY 10014','212-366-2000'),
    -> ('Harcourt Brace Jovanovich','3 Park Ave, New York, NY 10016','212-420-5800'),
    -> ('W.W. Norton',' W. W. Norton & Company, Inc., 500 Fifth Avenue, New York, New York 10110','212-354-5500'),
    -> ('Scholastic','557 Broadway, New York, NY 10012','800-724-6527'),
    -> ('Bantam','375 Hudson Street, New York, NY 10014','212-366-2000'),
    -> ('Picador USA','175 Fifth Avenue, New York, NY 10010','646-307-5745')
    -> ;
Query OK, 16 rows affected (0.070 sec)
Records: 16  Duplicates: 0  Warnings: 0
```

```
MariaDB [sql_project]> INSERT INTO borrower
    -> (borrower_CardNo,borrower_BorrowerName, borrower_BorrowerAddress, borrower_BorrowerPhone)
    -> VALUES
    -> (100,'Joe Smith','1321 4th Street, New York, NY 10014','212-312-1234'),
    -> (99,'Jane Smith','1321 4th Street, New York, NY 10014','212-931-4124'),
    -> (98,'Tom Li','981 Main Street, Ann Arbor, MI 48104','734-902-7455'),
    -> (5,'Angela Thompson','2212 Green Avenue, Ann Arbor, MI 48104','313-591-2122'),
    -> (8,'Harry Emnace','121 Park Drive, Ann Arbor, MI 48104','412-512-5522'),
    -> (95,'Tom Haverford','23 75th Street, New York, NY 10014','212-631-3418'),
    -> (7,'Haley Jackson','231 52nd Avenue New York, NY 10014','212-419-9935'),
    -> (10,'Michael Horford','653 Glen Avenue, Ann Arbor, MI 48104','734-998-1513');
Query OK, 8 rows affected (0.005 sec)
Records: 8  Duplicates: 0  Warnings: 0
```

Update into table

```
MariaDB [sql_project]> update book_publisher set publisher_PublisherPhone='232-840-1230' where publisher_PublisherName='Alfred A. Knopf';
Query OK, 1 row affected (0.003 sec)
Rows matched: 1  Changed: 1  Warnings: 0
```

Delete from table

```
MariaDB [sql_project]> --delete book_authors for book_authors_AuthorName to Mark Lee--
MariaDB [sql_project]> delete from book_authors where book_authors_AuthorName='Mark Lee';
Query OK, 1 row affected (0.003 sec)
```

Data Query Language (DQL)

Select all the data from table

Ex:

```
MariaDB [sql_project]> select * from book_publisher ;
+-----------------------------+-------------------------------------------------------------------------+-----------------------+
| publisher_PublisherName     | publisher_PublisherAddress                                              | publisher_PublisherPhone |
+-----------------------------+-------------------------------------------------------------------------+-----------------------+
| Alfred A. Knopf             | The Knopf Doubleday Group Domestic Rights, 1745 Broadway, New York, NY 10019 | 212-940-7390      |
| Bantam                      | 375 Hudson Street, New York, NY 10014                                   | 212-366-2000          |
| Bloomsbury                  | Bloomsbury Publishing Inc., 1385 Broadway, 5th Floor, New York, NY 10018 | 212-419-5300          |
| Chalto & Windus             | 375 Hudson Street, New York, NY 10014                                   | 212-366-2000          |
| Chilton Books               | Not Available                                                           | Not Available         |
| DAW Books                   | 375 Hudson Street, New York, NY 10014                                   | 212-366-2000          |
| George Allen & Unwin        | 83 Alexander Ln, Crows Nest NSW 2065, Australia                         | +61-2-8425-0100       |
| Harcourt Brace Jovanovich   | 3 Park Ave, New York, NY 10016                                          | 212-420-5800          |
| Harper and Row              | HarperCollins Publishers, 195 Broadway, New York, NY 10007             | 212-207-7000          |
| Pan Books                   | 175 Fifth Avenue, New York, NY 10010                                   | 646-307-5745          |
| Picador USA                 | 175 Fifth Avenue, New York, NY 10010                                   | 646-307-5745          |
| Scholastic                  | 557 Broadway, New York, NY 10012                                       | 800-724-6527          |
| Shinchosa                   | Oga Bldg. 8, 2-5-4 Sarugaku-cho, Chiyoda-ku, Tokyo 101-0064 Japan      | +81-3-5577-6507       |
| Signet Books                | 375 Hudson Street, New York, NY 10014                                   | 212-366-2000          |
| Viking                      | 375 Hudson Street, New York, NY 10014                                   | 212-366-2000          |
| W.W. Norton                 | W. W. Norton & Company, Inc., 500 Fifth Avenue, New York, New York 10110 | 212-354-5500        |
+-----------------------------+-------------------------------------------------------------------------+-----------------------+
```

```
MariaDB [sql_project]> select * from book_details;
+-------------+-----------------------------------------------------+-----------------------------+
| book_BookID | book_Title                                          | book_PublisherName          |
+-------------+-----------------------------------------------------+-----------------------------+
|           1 | The Name of the Wind                                | DAW Books                   |
|           2 | It                                                  | Viking                      |
|           3 | The Green Mile                                      | Signet Books                |
|           4 | Dune                                                | Chilton Books               |
|           5 | The Hobbit                                          | George Allen & Unwin        |
|           6 | Eragon                                              | Alfred A. Knopf             |
|           7 | A Wise Mans Fear                                    | DAW Books                   |
|           8 | Harry Potter and the Philosophers Stone             | Bloomsbury                  |
|           9 | Hard Boiled Wonderland and The End of the World     | Shinchosa                   |
|          10 | The Giving Tree                                     | Harper and Row              |
|          11 | The Hitchhikers Guide to the Galaxy                 | Pan Books                   |
|          12 | Brave New World                                     | Chalto & Windus             |
|          13 | The Princess Bride                                  | Harcourt Brace Jovanovich   |
|          14 | Fight Club                                          | W.W. Norton                 |
|          15 | Holes                                               | Scholastic                  |
|          16 | Harry Potter and the Chamber of Secrets             | Bloomsbury                  |
|          17 | Harry Potter and the Prisoner of Azkaban            | Bloomsbury                  |
|          18 | The Fellowship of the Ring                          | George Allen & Unwin        |
|          19 | A Game of Thrones                                   | Bantam                      |
|          20 | The Lost Tribe                                      | Picador USA                 |
+-------------+-----------------------------------------------------+-----------------------------+
20 rows in set (0.000 sec)
```

```
MariaDB [sql_project]> select * from library_branch ;
+-----------------------+-------------------------+----------------------------------------------+
| library_branch_BranchID | library_branch_BranchName | library_branch_BranchAddress               |
+-----------------------+-------------------------+----------------------------------------------+
|                     1 | Sharpstown              | 32 Corner Road, New York, NY 10012           |
|                     2 | Central                 | 491 3rd Street, New York, NY 10014           |
|                     3 | Saline                  | 40 State Street, Saline, MI 48176            |
|                     4 | Ann Arbor               | 101 South University, Ann Arbor, MI 48104    |
+-----------------------+-------------------------+----------------------------------------------+
4 rows in set (0.000 sec)
```

```
MariaDB [sql_project]> select * from borrower;
+-----------------+----------------------+------------------------------------------+----------------------+
| borrower_CardNo | borrower_BorrowerName | borrower_BorrowerAddress                | borrower_BorrowerPhone |
+-----------------+----------------------+------------------------------------------+----------------------+
|               5 | Angela Thompson      | 2212 Green Avenue, Ann Arbor, MI 48104   | 313-591-2122         |
|               7 | Haley Jackson        | 231 52nd Avenue New York, NY 10014       | 212-419-9935         |
|               8 | Harry Emnace         | 121 Park Drive, Ann Arbor, MI 48104      | 412-512-5522         |
|              10 | Michael Horford      | 653 Glen Avenue, Ann Arbor, MI 48104     | 734-998-1513         |
|              95 | Tom Haverford        | 23 75th Street, New York, NY 10014       | 212-631-3418         |
|              98 | Tom Li               | 981 Main Street, Ann Arbor, MI 48104     | 734-902-7455         |
|              99 | Jane Smith           | 1321 4th Street, New York, NY 10014      | 212-931-4124         |
|             100 | Joe Smith            | 1321 4th Street, New York, NY 10014      | 212-312-1234         |
+-----------------+----------------------+------------------------------------------+----------------------+
8 rows in set (0.000 sec)
```

Order by ascending order

```
MariaDB [sql_project]> select * from book_publisher order by publisher_PublisherName;
+------------------------+-----------------------------------------------------------------------------------+------------------------+
| publisher_PublisherName | publisher_PublisherAddress                                                       | publisher_PublisherPhone |
+------------------------+-----------------------------------------------------------------------------------+------------------------+
| Alfred A. Knopf        | The Knopf Doubleday Group Domestic Rights, 1745 Broadway, New York, NY 10019       | 232-840-1230           |
| Bantam                 | 375 Hudson Street, New York, NY 10014                                             | 212-366-2000           |
| Bloomsbury             | Bloomsbury Publishing Inc., 1385 Broadway, 5th Floor, New York, NY 10018          | 212-419-5300           |
| Chalto & Windus        | 375 Hudson Street, New York, NY 10014                                             | 212-366-2000           |
| Chilton Books          | Not Available                                                                     | Not Available          |
| DAW Books              | 375 Hudson Street, New York, NY 10014                                             | 212-366-2000           |
| George Allen & Unwin   | 83 Alexander Ln, Crows Nest NSW 2065, Australia                                   | +61-2-8425-0100        |
| Harcourt Brace Jovanovich | 3 Park Ave, New York, NY 10016                                                 | 212-420-5800           |
| Harper and Row         | HarperCollins Publishers, 195 Broadway, New York, NY 10007                        | 212-207-7000           |
| Pan Books              | 175 Fifth Avenue, New York, NY 10010                                             | 646-307-5745           |
| Picador USA            | 175 Fifth Avenue, New York, NY 10010                                             | 646-307-5745           |
| Scholastic             | 557 Broadway, New York, NY 10012                                                 | 800-724-6527           |
| Shinchosa              | Oga Bldg. 8, 2-5-4 Sarugaku-cho, Chiyoda-ku, Tokyo 101-0064 Japan                 | +81-3-5577-6507        |
| Signet Books           | 375 Hudson Street, New York, NY 10014                                             | 212-366-2000           |
| Viking                 | 375 Hudson Street, New York, NY 10014                                             | 212-366-2000           |
| W.W. Norton            |  W. W. Norton & Company, Inc., 500 Fifth Avenue, New York, New York 10110         | 212-354-5500           |
+------------------------+-----------------------------------------------------------------------------------+------------------------+
16 rows in set (0.001 sec)
```

Order by descending order

```
MariaDB [sql_project]> select * from book_publisher order by publisher_PublisherName desc;
+------------------------+-----------------------------------------------------------------------------------+------------------------+
| publisher_PublisherName | publisher_PublisherAddress                                                       | publisher_PublisherPhone |
+------------------------+-----------------------------------------------------------------------------------+------------------------+
| W.W. Norton            |  W. W. Norton & Company, Inc., 500 Fifth Avenue, New York, New York 10110         | 212-354-5500           |
| Viking                 | 375 Hudson Street, New York, NY 10014                                             | 212-366-2000           |
| Signet Books           | 375 Hudson Street, New York, NY 10014                                             | 212-366-2000           |
| Shinchosa              | Oga Bldg. 8, 2-5-4 Sarugaku-cho, Chiyoda-ku, Tokyo 101-0064 Japan                 | +81-3-5577-6507        |
| Scholastic             | 557 Broadway, New York, NY 10012                                                 | 800-724-6527           |
| Picador USA            | 175 Fifth Avenue, New York, NY 10010                                             | 646-307-5745           |
| Pan Books              | 175 Fifth Avenue, New York, NY 10010                                             | 646-307-5745           |
| Harper and Row         | HarperCollins Publishers, 195 Broadway, New York, NY 10007                        | 212-207-7000           |
| Harcourt Brace Jovanovich | 3 Park Ave, New York, NY 10016                                                 | 212-420-5800           |
| George Allen & Unwin   | 83 Alexander Ln, Crows Nest NSW 2065, Australia                                   | +61-2-8425-0100        |
| DAW Books              | 375 Hudson Street, New York, NY 10014                                             | 212-366-2000           |
| Chilton Books          | Not Available                                                                     | Not Available          |
| Chalto & Windus        | 375 Hudson Street, New York, NY 10014                                             | 212-366-2000           |
| Bloomsbury             | Bloomsbury Publishing Inc., 1385 Broadway, 5th Floor, New York, NY 10018          | 212-419-5300           |
| Bantam                 | 375 Hudson Street, New York, NY 10014                                             | 212-366-2000           |
| Alfred A. Knopf        | The Knopf Doubleday Group Domestic Rights, 1745 Broadway, New York, NY 10019       | 232-840-1230           |
+------------------------+-----------------------------------------------------------------------------------+------------------------+
16 rows in set (0.000 sec)
```

Order by column

```
MariaDB [sql_project]> --Find all borrower order by card_no & name --
MariaDB [sql_project]> select * from borrower order by Borrower_Name, borrower_CardNo;
+-----------------+-----------------+----------------------------------------+------------------------+
| borrower_CardNo | Borrower_Name   | borrower_BorrowerAddress               | borrower_BorrowerPhone |
+-----------------+-----------------+----------------------------------------+------------------------+
|               5 | Angela Thompson | 2212 Green Avenue, Ann Arbor, MI 48104  | 313-591-2122           |
|               7 | Haley Jackson   | 231 52nd Avenue New York, NY 10014      | 212-419-9935           |
|               8 | Harry Emnace    | 121 Park Drive, Ann Arbor, MI 48104     | 412-512-5522           |
|              99 | Jane Smith      | 1321 4th Street, New York, NY 10014     | 212-931-4124           |
|             100 | Joe Smith       | 1321 4th Street, New York, NY 10014     | 212-312-1234           |
|              10 | Michael Horford | 653 Glen Avenue, Ann Arbor, MI 48104    | 734-998-1513           |
|              95 | Tom Haverford   | 23 75th Street, New York, NY 10014      | 212-631-3418           |
|              98 | Tom Li          | 981 Main Street, Ann Arbor, MI 48104    | 734-902-7455           |
+-----------------+-----------------+----------------------------------------+------------------------+
8 rows in set (0.000 sec)
```

Select query for limited records

```
MariaDB [sql_project]> select * from borrower limit 3;
+-----------------+-----------------+----------------------------------------+------------------------+
| borrower_CardNo | Borrower_Name   | borrower_BorrowerAddress               | borrower_BorrowerPhone |
+-----------------+-----------------+----------------------------------------+------------------------+
|               5 | Angela Thompson | 2212 Green Avenue, Ann Arbor, MI 48104  | 313-591-2122           |
|               7 | Haley Jackson   | 231 52nd Avenue New York, NY 10014      | 212-419-9935           |
|               8 | Harry Emnace    | 121 Park Drive, Ann Arbor, MI 48104     | 412-512-5522           |
+-----------------+-----------------+----------------------------------------+------------------------+
3 rows in set (0.000 sec)
```

Select query with specific columns

```
MariaDB [sql_project]> --select querry with specific column--
MariaDB [sql_project]> select borrower_CardNo, borrower_Name from borrower;
+-----------------+------------------+
| borrower_CardNo | borrower_Name    |
+-----------------+------------------+
|               5 | Angela Thompson  |
|               7 | Haley Jackson    |
|               8 | Harry Emnace     |
|              10 | Michael Horford  |
|              95 | Tom Haverford    |
|              98 | Tom Li           |
|              99 | Jane Smith       |
|             100 | Joe Smith        |
+-----------------+------------------+
8 rows in set (0.001 sec)
```

Select query with change in column name

```
MariaDB [sql_project]> --select querry with change in column name--
MariaDB [sql_project]> select borrower_CardNo as b_carrdno , borrower_Name as b_name from borrower;
+----------+------------------+
| b_carrdno | b_name          |
+----------+------------------+
|        5 | Angela Thompson  |
|        7 | Haley Jackson    |
|        8 | Harry Emnace     |
|       10 | Michael Horford  |
|       95 | Tom Haverford    |
|       98 | Tom Li           |
|       99 | Jane Smith       |
|      100 | Joe Smith        |
+----------+------------------+
8 rows in set (0.001 sec)
```

Select query to replace specific value

```
MariaDB [sql_project]> select replace (publisher_PublisherName,'Bloomsbury','Burbury') as Replaced_name from book_publisher where publisher_PublisherAddress='Bloomsbury
 Publishing Inc., 1385 Broadway, 5th Floor, New York, NY 10018';
+---------------+
| Replaced_name |
+---------------+
| Burbury       |
+---------------+
1 row in set (0.001 sec)
```

Select query to display the unique records from the particular column

```
MariaDB [sql_project]> --Display unique book from book_details--
MariaDB [sql_project]> select distinct book_Title from book_details;
+--------------------------------------------------+
| book_Title                                       |
+--------------------------------------------------+
| The Name of the Wind                             |
| It                                               |
| The Green Mile                                   |
| Dune                                             |
| The Hobbit                                       |
| Eragon                                           |
| A Wise Mans Fear                                 |
| Harry Potter and the Philosophers Stone          |
| Hard Boiled Wonderland and The End of the World  |
| The Giving Tree                                  |
| The Hitchhikers Guide to the Galaxy              |
| Brave New World                                  |
| The Princess Bride                               |
| Fight Club                                       |
| Holes                                            |
| Harry Potter and the Chamber of Secrets          |
| Harry Potter and the Prisoner of Azkaban         |
| The Fellowship of the Ring                       |
| A Game of Thrones                                |
| The Lost Tribe                                   |
+--------------------------------------------------+
20 rows in set (0.002 sec)
```

Using where clause

With Comparison Operator

- **Equal to**

```
MariaDB [sql_project]> ----Display library_branch details who's library_branch_BranchName is 'Sharpstown'-
MariaDB [sql_project]> select * from library_branch where library_branch_BranchName='Sharpstown';
+----------------------+------------------------+---------------------------------+
| library_branch_BranchID | library_branch_BranchName | library_branch_BranchAddress |
+----------------------+------------------------+---------------------------------+
|                    1 | Sharpstown             | 32 Corner Road, New York, NY 10012 |
+----------------------+------------------------+---------------------------------+
1 row in set (0.001 sec)
```

- **Less than**

```
MariaDB [sql_project]> -- Display book_loans_LoansID, book_loans_CardNo, book_loans_DateOut, book_loans_DueDate of those persons who's are book_loans_DateOut is less th
an '1/3/18' --
MariaDB [sql_project]> select book_loans_LoansID, book_loans_CardNo, book_loans_DateOut, book_loans_DueDate from book_loans where book_loans_DateOut<'1/3/18';
+--------------------+------------------+--------------------+-------------------+
| book_loans_LoansID | book_loans_CardNo | book_loans_DateOut | book_loans_DueDate |
+--------------------+------------------+--------------------+-------------------+
|                  1 |              100 | 1/1/18             | 2/2/18            |
|                  2 |              100 | 1/1/18             | 2/2/18            |
|                  3 |              100 | 1/1/18             | 2/2/18            |
|                  4 |              100 | 1/1/18             | 2/2/18            |
+--------------------+------------------+--------------------+-------------------+
4 rows in set (0.001 sec)
```

- **Not equal to**

```
MariaDB [sql_project]> --Display borrower details who's Borrower_Name is not equal to Haley Jackson--
MariaDB [sql_project]> select * from borrower where Borrower_Name!='Haley Jackson';
+------------------+------------------+-----------------------------------------+----------------------+
| borrower_CardNo  | Borrower_Name    | borrower_BorrowerAddress                | borrower_BorrowerPhone |
+------------------+------------------+-----------------------------------------+----------------------+
|               5 | Angela Thompson  | 2212 Green Avenue, Ann Arbor, MI 48104   | 313-591-2122         |
|               8 | Harry Emnace     | 121 Park Drive, Ann Arbor, MI 48104      | 412-512-5522         |
|              10 | Michael Horford  | 653 Glen Avenue, Ann Arbor, MI 48104     | 734-998-1513         |
|              95 | Tom Haverford    | 23 75th Street, New York, NY 10014       | 212-631-3418         |
|              98 | Tom Li           | 981 Main Street, Ann Arbor, MI 48104     | 734-902-7455         |
|              99 | Jane Smith       | 1321 4th Street, New York, NY 10014      | 212-931-4124         |
|             100 | Joe Smith        | 1321 4th Street, New York, NY 10014      | 212-312-1234         |
+------------------+------------------+-----------------------------------------+----------------------+
```

Using Logical Operator

Using AND operator

```
MariaDB [sql_project]> --AND operator--
MariaDB [sql_project]> select * from library_branch where library_branch_BranchID=1 and library_branch_BranchName='Sharpstown';
+----------------------+------------------------+---------------------------------+
| library_branch_BranchID | library_branch_BranchName | library_branch_BranchAddress |
+----------------------+------------------------+---------------------------------+
|                    1 | Sharpstown             | 32 Corner Road, New York, NY 10012 |
+----------------------+------------------------+---------------------------------+
1 row in set (0.000 sec)
```

Using OR operator

```
MariaDB [sql_project]> --OR operator--
MariaDB [sql_project]> select * from library_branch where library_branch_BranchID=1 or library_branch_BranchName='Central';
+----------------------+------------------------+---------------------------------+
| library_branch_BranchID | library_branch_BranchName | library_branch_BranchAddress |
+----------------------+------------------------+---------------------------------+
|                    1 | Sharpstown             | 32 Corner Road, New York, NY 10012 |
|                    2 | Central                | 491 3rd Street, New York, NY 10014 |
+----------------------+------------------------+---------------------------------+
2 rows in set (0.001 sec)
```

Using between operator

```
MariaDB [sql_project]> --between operator--
MariaDB [sql_project]> select * from book_loans where book_loans_LoansID between 1 and 8;
+-----------------+----------------+------------------+------------------+------------------+------------------+
| book_loans_LoansID | book_loans_BookID | book_loans_BranchID | book_loans_CardNo | book_loans_DateOut | book_loans_DueDate |
+-----------------+----------------+------------------+------------------+------------------+------------------+
|               1 |              1 |                1 |              100 | 1/1/18           | 2/2/18           |
|               2 |              2 |                1 |              100 | 1/1/18           | 2/2/18           |
|               3 |              3 |                1 |              100 | 1/1/18           | 2/2/18           |
|               4 |              4 |                1 |              100 | 1/1/18           | 2/2/18           |
|               5 |              5 |                1 |              102 | 1/3/18           | 2/3/18           |
|               6 |              6 |                1 |              102 | 1/3/18           | 2/3/18           |
|               7 |              7 |                1 |              102 | 1/3/18           | 2/3/18           |
|               8 |              8 |                1 |              102 | 1/3/18           | 2/3/18           |
+-----------------+----------------+------------------+------------------+------------------+------------------+
8 rows in set (0.002 sec)
```

Using IN operator

```
MariaDB [sql_project]> --IN Operator--
MariaDB [sql_project]> select * from book_details where book_BookID in(1,2,7,8,5,9,54);
+-------------+---------------------------------------------------+-----------------------+
| book_BookID | book_Title                                        | book_PublisherName    |
+-------------+---------------------------------------------------+-----------------------+
|           1 | The Name of the Wind                              | DAW Books             |
|           2 | It                                                | Viking                |
|           5 | The Hobbit                                        | George Allen & Unwin  |
|           7 | A Wise Mans Fear                                  | DAW Books             |
|           8 | Harry Potter and the Philosophers Stone           | Bloomsbury            |
|           9 | Hard Boiled Wonderland and The End of the World   | Shinchosa             |
+-------------+---------------------------------------------------+-----------------------+
6 rows in set (0.001 sec)
```

Aggregate functions

Count function

```
MariaDB [sql_project]> select count(*) from book_details;
+----------+
| count(*) |
+----------+
|       20 |
+----------+
1 row in set (0.001 sec)

MariaDB [sql_project]> select count(book_BookID) from book_details;
+--------------------+
| count(book_BookID) |
+--------------------+
|                 20 |
+--------------------+
1 row in set (0.000 sec)
```

Average function

```
MariaDB [sql_project]> select avg(book_copies_No_Of_Copies) from book_copies;
+-------------------------------+
| avg(book_copies_No_Of_Copies) |
+-------------------------------+
|                        5.0000 |
+-------------------------------+
1 row in set (0.004 sec)
```

Sum function

```
MariaDB [sql_project]> select sum(book_copies_No_Of_Copies) from book_copies;
+-------------------------------+
| sum(book_copies_No_Of_Copies) |
+-------------------------------+
|                            65 |
+-------------------------------+
1 row in set (0.000 sec)
```

Group by clause

```
MariaDB [sql_project]> select count(book_loans_BranchID),book_loans_BranchID from book_loans group by book_loans_BranchID;
+----------------------------+---------------------+
| count(book_loans_BranchID) | book_loans_BranchID |
+----------------------------+---------------------+
|                         10 |                   1 |
|                          8 |                   2 |
+----------------------------+---------------------+
2 rows in set (0.000 sec)
```

Like operator

```
MariaDB [sql_project]> --like Operator--
MariaDB [sql_project]> select * from book_publisher where publisher_PublisherName like '% Books%';
+------------------------+----------------------------------------+------------------------+
| publisher_PublisherName | publisher_PublisherAddress            | publisher_PublisherPhone |
+------------------------+----------------------------------------+------------------------+
| Chilton Books          | Not Available                          | Not Available          |
| DAW Books              | 375 Hudson Street, New York, NY 10014  | 212-366-2000           |
| Pan Books              | 175 Fifth Avenue, New York, NY 10010   | 646-307-5745           |
| Signet Books           | 375 Hudson Street, New York, NY 10014  | 212-366-2000           |
+------------------------+----------------------------------------+------------------------+
4 rows in set (0.000 sec)
```

```
MariaDB [sql_project]> select * from book_publisher where publisher_PublisherPhone like '_____-2000';
+------------------------+----------------------------------------+------------------------+
| publisher_PublisherName | publisher_PublisherAddress            | publisher_PublisherPhone |
+------------------------+----------------------------------------+------------------------+
| Bantam                 | 375 Hudson Street, New York, NY 10014  | 212-366-2000           |
| Chalto & Windus        | 375 Hudson Street, New York, NY 10014  | 212-366-2000           |
| DAW Books              | 375 Hudson Street, New York, NY 10014  | 212-366-2000           |
| Signet Books           | 375 Hudson Street, New York, NY 10014  | 212-366-2000           |
| Viking                 | 375 Hudson Street, New York, NY 10014  | 212-366-2000           |
+------------------------+----------------------------------------+------------------------+
5 rows in set (0.001 sec)
```

Joins

```
ERROR 1054 (42S22): Unknown column 'p.book_PublisherName' in 'on clause'
MariaDB [sql_project]> Select p.publisher_PublisherName, publisher_PublisherAddress, book_BookID from book_publisher p inner join book_details d on
    -> p.publisher_PublisherName=d.book_PublisherName;
+-------------------------+--------------------------------------------------------------------------------+-------------+
| publisher_PublisherName | publisher_PublisherAddress                                                     | book_BookID |
+-------------------------+--------------------------------------------------------------------------------+-------------+
| Alfred A. Knopf         | The Knopf Doubleday Group Domestic Rights, 1745 Broadway, New York, NY 10019   |           6 |
| Bantam                  | 375 Hudson Street, New York, NY 10014                                          |          19 |
| Bloomsbury              | Bloomsbury Publishing Inc., 1385 Broadway, 5th Floor, New York, NY 10018       |           8 |
| Bloomsbury              | Bloomsbury Publishing Inc., 1385 Broadway, 5th Floor, New York, NY 10018       |          16 |
| Bloomsbury              | Bloomsbury Publishing Inc., 1385 Broadway, 5th Floor, New York, NY 10018       |          17 |
| Chalto & Windus         | 375 Hudson Street, New York, NY 10014                                          |          12 |
| Chilton Books           | Not Available                                                                  |           4 |
| DAW Books               | 375 Hudson Street, New York, NY 10014                                          |           1 |
| DAW Books               | 375 Hudson Street, New York, NY 10014                                          |           7 |
| George Allen & Unwin    | 83 Alexander Ln, Crows Nest NSW 2065, Australia                                |           5 |
| George Allen & Unwin    | 83 Alexander Ln, Crows Nest NSW 2065, Australia                                |          18 |
| Harcourt Brace Jovanovich | 3 Park Ave, New York, NY 10016                                               |          13 |
| Harper and Row          | HarperCollins Publishers, 195 Broadway, New York, NY 10007                     |          10 |
| Pan Books               | 175 Fifth Avenue, New York, NY 10010                                           |          11 |
| Picador USA             | 175 Fifth Avenue, New York, NY 10010                                           |          20 |
| Scholastic              | 557 Broadway, New York, NY 10012                                               |          15 |
| Shinchosa               | Oga Bldg. 8, 2-5-4 Sarugaku-cho, Chiyoda-ku, Tokyo 101-0064 Japan              |           9 |
| Signet Books            | 375 Hudson Street, New York, NY 10014                                          |           3 |
| Viking                  | 375 Hudson Street, New York, NY 10014                                          |           2 |
| W.W. Norton             |  W. W. Norton & Company, Inc., 500 Fifth Avenue, New York, New York 10110      |          14 |
+-------------------------+--------------------------------------------------------------------------------+-------------+
20 rows in set (0.002 sec)
```

```
MariaDB [sql_project]> select b.book_BookID, book_Title, book_authors_AuthorID, book_authors_AuthorName from book_details b left outer join book_authors a on b.book_Boo
kID=a.book_authors_BookID ;
+-------------+-----------------------------------------------+-----------------------+-------------------------+
| book_BookID | book_Title                                    | book_authors_AuthorID | book_authors_AuthorName |
+-------------+-----------------------------------------------+-----------------------+-------------------------+
|           1 | The Name of the Wind                          |                     1 | Patrick Rothfuss        |
|           2 | It                                            |                     2 | Stephen King            |
|           3 | The Green Mile                               |                     3 | Stephen King            |
|           4 | Dune                                          |                     4 | Frank Herbert           |
|           5 | The Hobbit                                    |                     5 | J.R.R. Tolkien          |
|           6 | Eragon                                        |                     6 | Christopher Paolini     |
|           6 | Eragon                                        |                     7 | Patrick Rothfuss        |
|           7 | A Wise Mans Fear                              |                  NULL | NULL                    |
|           8 | Harry Potter and the Philosophers Stone       |                     8 | J.K. Rowling            |
|           9 | Hard Boiled Wonderland and The End of the World |                   9 | Haruki Murakami         |
|          10 | The Giving Tree                               |                    10 | Shel Silverstein        |
|          11 | The Hitchhikers Guide to the Galaxy           |                    11 | Douglas Adams           |
|          12 | Brave New World                               |                    12 | Aldous Huxley           |
|          13 | The Princess Bride                            |                    13 | William Goldman         |
|          14 | Fight Club                                     |                    14 | Chuck Palahniuk         |
|          15 | Holes                                         |                    15 | Louis Sachar            |
|          16 | Harry Potter and the Chamber of Secrets       |                    16 | J.K. Rowling            |
|          17 | Harry Potter and the Prisoner of Azkaban      |                    17 | J.K. Rowling            |
|          18 | The Fellowship of the Ring                    |                    18 | J.R.R. Tolkien          |
|          19 | A Game of Thrones                             |                    19 | George R.R. Martin      |
|          20 | The Lost Tribe                                |                  NULL | NULL                    |
+-------------+-----------------------------------------------+-----------------------+-------------------------+
21 rows in set (0.002 sec)
```

Subquery

```
MariaDB [sql_project]> --WAQ to display book details whose book_BookID is more than min book_BookID of publishername 'Bloomsbury'--
MariaDB [sql_project]> select * from book_details where book_BookID>(select min(book_BookID) from book_details where book_PublisherName='Bloomsbury');
+-------------+-------------------------------------------------+---------------------------+
| book_BookID | book_Title                                      | book_PublisherName        |
+-------------+-------------------------------------------------+---------------------------+
|           9 | Hard Boiled Wonderland and The End of the World | Shinchosa                 |
|          10 | The Giving Tree                                 | Harper and Row            |
|          11 | The Hitchhikers Guide to the Galaxy             | Pan Books                 |
|          12 | Brave New World                                 | Chalto & Windus           |
|          13 | The Princess Bride                              | Harcourt Brace Jovanovich |
|          14 | Fight Club                                       | W.W. Norton               |
|          15 | Holes                                           | Scholastic                |
|          16 | Harry Potter and the Chamber of Secrets         | Bloomsbury                |
|          17 | Harry Potter and the Prisoner of Azkaban        | Bloomsbury                |
|          18 | The Fellowship of the Ring                      | George Allen & Unwin      |
|          19 | A Game of Thrones                               | Bantam                    |
|          20 | The Lost Tribe                                  | Picador USA               |
+-------------+-------------------------------------------------+---------------------------+
12 rows in set (0.001 sec)
```

```
MariaDB [sql_project]> --Display book_publisher details whose PublisherName are same as jobs of 'Bantam' and like Books--
MariaDB [sql_project]> select * from book_publisher where publisher_PublisherName in(select publisher_PublisherName from book_publisher where publisher_PublisherName='B
antam' or publisher_PublisherName like '%Books');
+------------------------+-----------------------------------+-----------------------+
| publisher_PublisherName | publisher_PublisherAddress        | publisher_PublisherPhone |
+------------------------+-----------------------------------+-----------------------+
| Bantam                 | 375 Hudson Street, New York, NY 10014 | 212-366-2000          |
| Chilton Books          | Not Available                     | Not Available         |
| DAW Books              | 375 Hudson Street, New York, NY 10014 | 212-366-2000          |
| Pan Books              | 175 Fifth Avenue, New York, NY 10010 | 646-307-5745          |
| Signet Books           | 375 Hudson Street, New York, NY 10014 | 212-366-2000          |
+------------------------+-----------------------------------+-----------------------+
5 rows in set (0.001 sec)
```

Views

Create view

```
MariaDB [sql_project]> create view book_publisher_view as select publisher_PublisherName,publisher_PublisherAddress from book_publisher;
Query OK, 0 rows affected (0.006 sec)
```

Data of view table

```
MariaDB [sql_project]> select * from book_publisher_view;
+----------------------------+-------------------------------------------------------------------------------------+
| publisher_PublisherName    | publisher_PublisherAddress                                                          |
+----------------------------+-------------------------------------------------------------------------------------+
| Alfred A. Knopf            | The Knopf Doubleday Group Domestic Rights, 1745 Broadway, New York, NY 10019         |
| Bantam                     | 375 Hudson Street, New York, NY 10014                                               |
| Bloomsbury                 | Bloomsbury Publishing Inc., 1385 Broadway, 5th Floor, New York, NY 10018            |
| Chalto & Windus            | 375 Hudson Street, New York, NY 10014                                               |
| Chilton Books              | Not Available                                                                        |
| DAW Books                  | 375 Hudson Street, New York, NY 10014                                               |
| George Allen & Unwin       | 83 Alexander Ln, Crows Nest NSW 2065, Australia                                      |
| Harcourt Brace Jovanovich  | 3 Park Ave, New York, NY 10016                                                       |
| Harper and Row             | HarperCollins Publishers, 195 Broadway, New York, NY 10007                           |
| Pan Books                  | 175 Fifth Avenue, New York, NY 10010                                                |
| Picador USA                | 175 Fifth Avenue, New York, NY 10010                                                |
| Scholastic                 | 557 Broadway, New York, NY 10012                                                    |
| Shinchosa                  | Oga Bldg. 8, 2-5-4 Sarugaku-cho, Chiyoda-ku, Tokyo 101-0064 Japan                    |
| Signet Books               | 375 Hudson Street, New York, NY 10014                                               |
| Viking                     | 375 Hudson Street, New York, NY 10014                                               |
| W.W. Norton                |  W. W. Norton & Company, Inc., 500 Fifth Avenue, New York, New York 10110           |
+----------------------------+-------------------------------------------------------------------------------------+
16 rows in set (0.003 sec)
```