RDBMS PROJECT
GROUP 7

LIBRARY MANAGEMENT SYSTEM

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OBJECTIVE:

A library is a collection of organized information and resources which is made accessible to a well-defined community for borrowing or reference sake. The main aim of this system is to develop a new programmed system that will conveying ever lasting solution to the manual base operations and to make available a channel through which staff can maintain the record easily and customers can access the information about the library at whatever place they might find themselves.

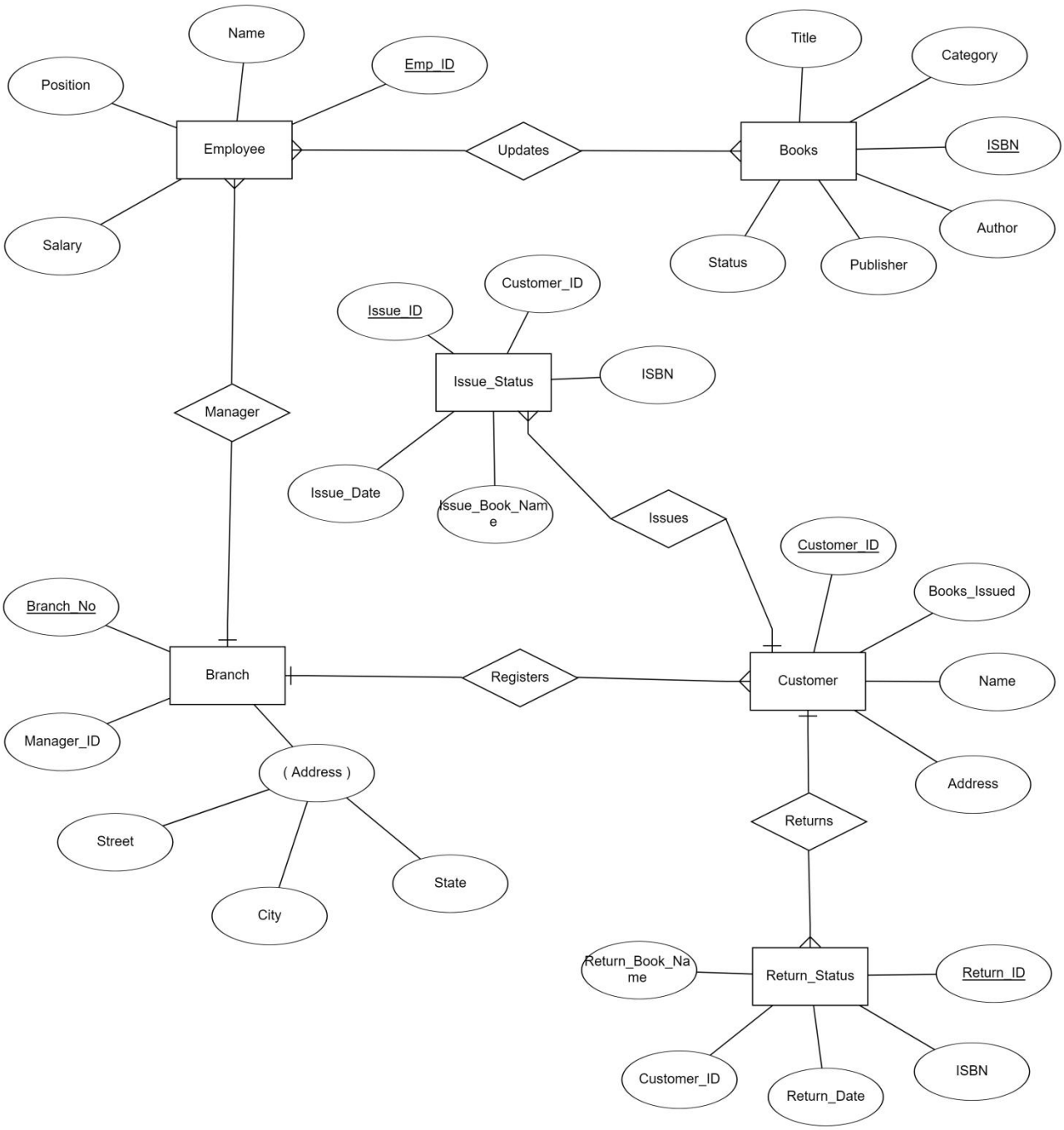
Library Management System allows the user to store the book details and the customer details. The system is strong enough to withstand regressive yearly operations under conditions where the database is maintained and cleared over a certain time of span. The implementation of the system in the organization will considerably reduce data entry, time and also provide readily calculated reports.

It keeps track of all the information about the books in the library, status and total number of books available in the Library. The user will find it easy in this automated system rather than using the manual writing system. The system contains a database where all the information will be stored safely.

PROBLEM STATEMENT:

Construct an ER Model for a University Library Management System with Each Book having a title,category,author,publisher,status and a unique id--ISBN. All Employees with a unique employee id can update the status of the book(s).Each employee also has name,salary and position. The employee belongs to a particular branch having branch no and an address which contains contact no, street, city, state .There is one employee who is the manager of the branch. Any customer who wishes to issue a book(s) should be registered in any one of the branches of the University. Each customer has a name, address, customer_id, record of books issued. Issue and Return Status of every book must be handled separately on the basis of book name, issue/return id, date, customer id and ISBN.

ER MODEL:


Name
Position
Emp_ID
Employee
Salary
Updates
Title
Category
Books
ISBN
Author
Status
Publisher
Customer_ID
Issue_ID
Issue_Status
ISBN
Manager
Issue_Date
Issue_Book_Name
Issues
Customer_ID
Books_Issued
Branch_No
Branch
Registers
Customer
Name
Manager_ID
(Address)
Address
Street
State
City
Returns
Return_Book_Name
Return_Status
Return_ID
Customer_ID
Return_Date
ISBN

RELATIONAL MODEL:

Binary m:n relation:

Updates(***Employee_ID, ISBN***)
Employee(**Emp_ID**, Name,Position,Salary)
Books(**ISBN**,Status,Title,Publisher,Author,Category)

Binary 1:n relation:

Branch(**Branch_No**, Manager_ID, Address_Street, Address_City, Address_State, ***Emp_ID***)

Customer(**Customer_ID**,Books_issued,Name,Address, ***Branch_No***)

Issue_Status(**Issue_ID**, Issue_Date, **ISBN**, Issue_Book_Name,***Customer_ID***)

Return_Status(**Return_ID**, Return_Date, **ISBN**, Return_Book_Name,***Customer_ID***)

(Here, ISBN is foreign key in Issue_Status and Return_Status)

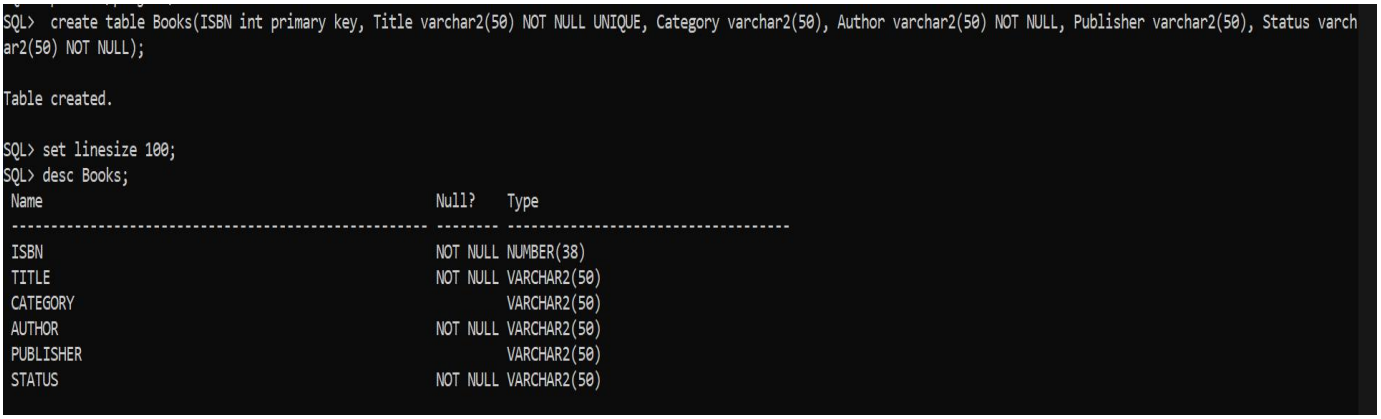
CREATING DATABASE

SQL> create table Books(ISBN int primary key, Title varchar2(50) NOT NULL UNIQUE, Category varchar2(50), Author varchar2(50) NOT NULL, Publisher varchar2(50), Status varchar2(50) NOT NULL);

Table created.

SQL> set linesize 100;
SQL> desc Books;

Name	Null?	Type
ISBN	NOT NULL	NUMBER(38)
TITLE	NOT NULL	VARCHAR2(50)
CATEGORY		VARCHAR2(50)
AUTHOR	NOT NULL	VARCHAR2(50)
PUBLISHER		VARCHAR2(50)
STATUS	NOT NULL	VARCHAR2(50)



SQL> create table Employee(EMPID int primary key, Name varchar2(50) NOT NULL, Position varchar2(50) NOT NULL, Salary int NOT NULL);

Table created.

SQL> desC Employee;

Name	Null?	Type
EMPID	NOT NULL	NUMBER(38)
NAME	NOT NULL	VARCHAR2(50)
POSITION	NOT NULL	VARCHAR2(50)
SALARY	NOT NULL	NUMBER(38)

```
SQL>  create table Employee(EMPID int primary key, Name varchar2(50) NOT NULL, Position varchar2(50) NOT NULL, Salary int NOT NULL);

Table created.

SQL> desC Employee;
 Name                                      Null?    Type
 ----------------------------------------- -------- ------------------------------
 EMPID                                     NOT NULL NUMBER(38)
 NAME                                      NOT NULL VARCHAR2(50)
 POSITION                                  NOT NULL VARCHAR2(50)
 SALARY                                    NOT NULL NUMBER(38)
```

SQL> create table Branch(Branch_no varchar2(5) NOT NULL, Manager_ID int NOT NULL, Street varchar2(50), City varchar2(50), State varchar2(50), PRIMARY KEY (Branch_no), FOREIGN KEY (Manager_ID) REFERENCES Employee (EMPID));

Table created.

SQL> desc Branch;

Name	Null?	Type
BRANCH_NO	NOT NULL	VARCHAR2(5)
MANAGER_ID	NOT NULL	NUMBER(38)
STREET		VARCHAR2(50)
CITY		VARCHAR2(50)
STATE		VARCHAR2(50)

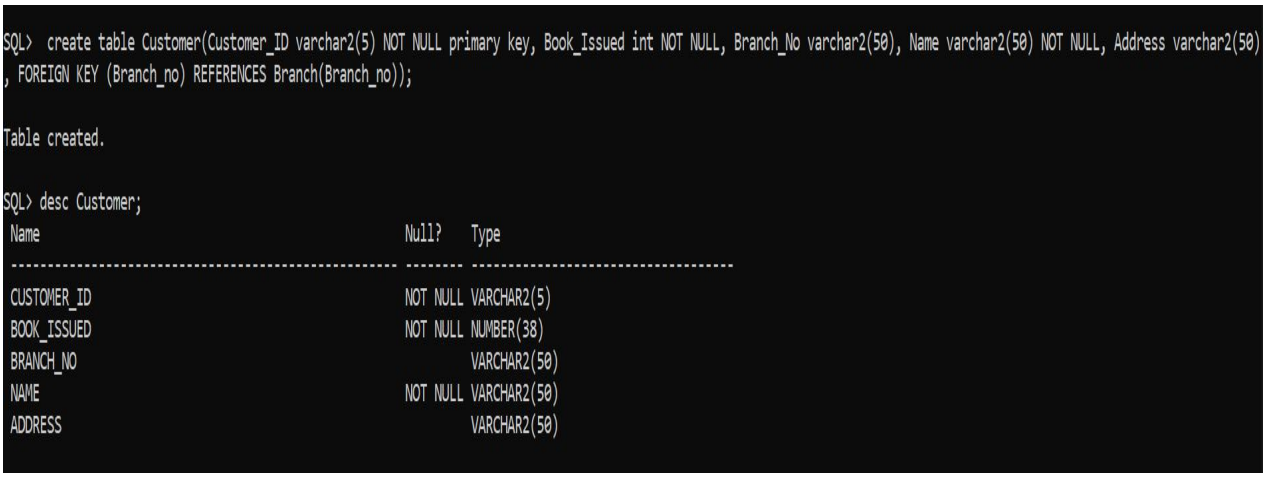
```
SQL>  create table Branch(Branch_no varchar2(5) NOT NULL, Manager_ID int NOT NULL, Street varchar2(50), City varchar2(50), State varchar2(50), PRIMARY KEY (Branch_no), FORE
IGN KEY (Manager_ID) REFERENCES Employee (EMPID));

Table created.

SQL> desc Branch;
 Name                                      Null?    Type
 ----------------------------------------- -------- ------------------------------
 BRANCH_NO                                 NOT NULL VARCHAR2(5)
 MANAGER_ID                                NOT NULL NUMBER(38)
 STREET                                             VARCHAR2(50)
 CITY                                               VARCHAR2(50)
 STATE                                              VARCHAR2(50)
```

SQL> create table Customer(Customer_ID varchar2(5) NOT NULL primary key, Book_Issued int NOT NULL, Branch_No varchar2(50), Name varchar2(50) NOT NULL, Address varchar2(50), FOREIGN KEY (Branch_no) REFERENCES Branch(Branch_no));

Table created.

SQL> desc Customer;

Name	Null?	Type
CUSTOMER_ID	NOT NULL	VARCHAR2(5)
BOOK_ISSUED	NOT NULL	NUMBER(38)
BRANCH_NO		VARCHAR2(50)
NAME	NOT NULL	VARCHAR2(50)
ADDRESS		VARCHAR2(50)



SQL> create table Issue_Status(Issue_ID varchar2(5) NOT NULL, Issue_Date date NOT NULL, ISBN int NOT NULL, Customer_ID varchar2(5), Issue_Book_Name varchar2(50), PRIMARY KEY (Issue_ID), FOREIGN KEY (Customer_ID) REFERENCES Customer (Customer_ID), FOREIGN KEY (ISBN) REFERENCES Books (ISBN));

Table created.

SQL> desc Issue_Status;

Name	Null?	Type
ISSUE_ID	NOT NULL	VARCHAR2(5)
ISSUE_DATE	NOT NULL	DATE
ISBN	NOT NULL	NUMBER(38)
CUSTOMER_ID		VARCHAR2(5)
ISSUE_BOOK_NAME		VARCHAR2(50)

```
SQL>  create table Issue_Status(Issue_ID varchar2(5) NOT NULL, Issue_Date date NOT NULL, ISBN int NOT NULL, Customer_ID varchar2(5), Issue_Book_Name varchar2(50), PRIMARY K
EY (Issue_ID), FOREIGN KEY (Customer_ID) REFERENCES Customer (Customer_ID), FOREIGN KEY (ISBN) REFERENCES Books (ISBN));

Table created.

SQL> desc Issue_Status;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 ISSUE_ID                                  NOT NULL VARCHAR2(5)
 ISSUE_DATE                                NOT NULL DATE
 ISBN                                      NOT NULL NUMBER(38)
 CUSTOMER_ID                                        VARCHAR2(5)
 ISSUE_BOOK_NAME                                    VARCHAR2(50)
```

SQL> create table Return_Status(Return_ID varchar2(5) NOT NULL, Return_Date date NOT NULL, ISBN int NOT NULL, Customer_ID varchar2(5), Return_Book_Name varchar2(50), PRIMARY KEY (Return_ID), FOREIGN KEY (Customer_ID) REFERENCES Customer (Customer_ID), FOREIGN KEY (ISBN) REFERENCES Books (ISBN));

Table created.

SQL> desc Return_status;

Name	Null?	Type
RETURN_ID	NOT NULL	VARCHAR2(5)
RETURN_DATE	NOT NULL	DATE
ISBN	NOT NULL	NUMBER(38)
CUSTOMER_ID		VARCHAR2(5)
RETURN_BOOK_NAME		VARCHAR2(50)

```
SQL> create table Return_Status(Return_ID varchar2(5) NOT NULL, Return_Date date NOT NULL, ISBN int NOT NULL, Customer_ID varchar2(5), Return_Book_Name varchar2(50), PRIMAR
Y KEY (Return_ID), FOREIGN KEY (Customer_ID) REFERENCES Customer (Customer_ID), FOREIGN KEY (ISBN) REFERENCES Books (ISBN));

Table created.

SQL> desc Return_status;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 RETURN_ID                                 NOT NULL VARCHAR2(5)
 RETURN_DATE                               NOT NULL DATE
 ISBN                                      NOT NULL NUMBER(38)
 CUSTOMER_ID                                        VARCHAR2(5)
 RETURN_BOOK_NAME                                   VARCHAR2(50)
```

SQL> insert into Books values(101, 'The Three Musketers', 'Fictional', 'Alexander Dima', 'Pegion Publications', 'Issued');

1 row created.

SQL> insert into Books values(102, 'Harry Potter', 'Fictional', 'J.K. Rowling', 'Bloomsbury Publications', 'Issued');

1 row created.

SQL> insert into Books values(103, 'Sherlock Homes', 'Detective', 'Arthur Conal Doyle', 'Pegion Publications', 'Not Issued');

1 row created.

SQL> insert into Books values(104, 'Discovery Of India', 'History', 'Jawaharlal Nehru', 'Jawaharlal Nehru', 'Not Issued');

1 row created.

SQL> insert into Books values(105, 'Long Walk to Freedom', 'Autobiography', 'Nelson Mandela', 'Little Brown ', 'Issued');

1 row created.

```
SQL>  insert into Books values(101, 'The Three Musketers', 'Fictional', 'Alexander Dima', 'Pegion Publications', 'Issued');

1 row created.

SQL>  insert into Books values(102, 'Harry Potter', 'Fictional', 'J.K. Rowling', 'Bloomsbury Publications', 'Issued');

1 row created.

SQL> insert into Books values(103, 'Sherlock Homes', 'Detective', 'Arthur Conal Doyle', 'Pegion Publications', 'Not Issued');

1 row created.

SQL> insert into Books values(104, 'Discovery Of India', 'History', 'Jawaharlal Nehru', 'Jawaharlal Nehru', 'Not Issued');

1 row created.

SQL> insert into Books values(105, 'Long Walk to Freedom', 'Autobiography', 'Nelson Mandela', 'Little Brown ', 'Issued');

1 row created.
```

SQL> set linesize 2000;
SQL> select * from Books;

ISBN	TITLE	CATEGORY	AUTHOR	PUBLISHER	STATUS
101	The Three Musketers	Fictional	Alexander Dima	Pegion Publications	Issued
102	Harry Potter	Fictional	J.K. Rowling	Bloomsbury Publications	Issued
103	Sherlock Homes	Detective	Arthur Conal Doyle	Pegion Publications	Not Issued
104	Discovery Of India	History	Jawaharlal Nehru	Jawaharlal Nehru	Not Issued
105	Long Walk to Freedom	Autobiography	Nelson Mandela	Little Brown	Issued

```
SQL> set linesize 2000;
SQL> select * from Books;

     ISBN TITLE                                CATEGORY                                  AUTHOR                                    PUBLISHE
R                                    STATUS
---------- ---------------------------------------- ---------------------------------------- ---------------------------------------- --------
---------------------------------------- ----------
       101 The Three Musketers                       Fictional                                 Alexander Dima                            Pegion P
ublications                          Issued
       102 Harry Potter                              Fictional                                 J.K. Rowling                              Bloomsbu
ry Publications                      Issued
       103 Sherlock Homes                            Detective                                 Arthur Conal Doyle                        Pegion P
ublications                          Not Issued
       104 Discovery Of India                        History                                   Jawaharlal Nehru                          Jawaharl
al Nehru                                    Not Issued
       105 Long Walk to Freedom                      Autobiography                             Nelson Mandela                            Little B
rown                                 Issued

SQL>
```

SQL> insert into employee values(1, 'Raman Singh', 'Manager', 50000);

1 row created.

SQL> insert into employee values(2, 'Nitin Das', 'Librarian', 35000);

1 row created.

SQL> insert into employee values(3, 'Roshan Kumar', 'Librarian', 32500);

1 row created.

SQL> insert into employee values(4, 'Priya Tiwari', 'Staff', 20000);

1 row created.

SQL> insert into employee values(5, 'Amit Jha', 'Staff', 18000);

1 row created.

```
SQL> insert into employee values(1, 'Raman Singh', 'Manager', 50000);
1 row created.
SQL>  insert into employee values(2, 'Nitin Das', 'Librarian', 35000);
1 row created.
SQL>  insert into employee values(3, 'Roshan Kumar', 'Librarian', 32500);
1 row created.
SQL> insert into employee values(4, 'Priya Tiwari', 'Staff', 20000);
1 row created.
SQL> insert into employee values(5, 'Amit Jha', 'Staff', 18000);
1 row created.
```

SQL> set linesize 1000;
SQL> select * from Employee;

EMPID	NAME	POSITION	SALARY
1	Raman Singh	Manager	50000
2	Nitin Das	Librarian	35000
3	Roshan Kumar	Librarian	32500
4	Priya Tiwari	Staff	20000
5	Amit Jha	Staff	18000

```
SQL> set linesize 1000;
SQL> select * from Employee;

    EMPID NAME                                               POSITION                                                 SALARY
--------- -------------------------------------------------- -------------------------------------------------- ----------
        1 Raman Singh                                        Manager                                                 50000
        2 Nitin Das                                          Librarian                                               35000
        3 Roshan Kumar                                       Librarian                                               32500
        4 Priya Tiwari                                       Staff                                                   20000
        5 Amit Jha                                           Staff                                                   18000
```

SQL> insert into Branch values('B01', 1, '21, Lane Patia', 'Bhubaneshwar', 'Odisha');

1 row created.

SQL> insert into Branch values('B012', 2, '10, Park Street', 'Kolkata', 'West Bengal');

1 row created.

SQL> DELETE FROM Branch WHERE Branch_no='B012';

1 row deleted.

SQL> insert into Branch values('B02', 2, '10, Park Street', 'Kolkata', 'West Bengal');

1 row created.

SQL> insert into Branch values('B03', 3, '15, Salt Lake', 'Kolkata', 'West Bengal');

1 row created.

```
SQL> insert into Branch values('B01', 1, '21, Lane Patia', 'Bhubaneshwar', 'Odisha');

1 row created.

SQL> insert into Branch values('B012', 2, '10, Park Street', 'Kolkata', 'West Bengal');

1 row created.

SQL> DELETE FROM Branch WHERE Branch_no='B012';

1 row deleted.

SQL>  insert into Branch values('B02', 2, '10, Park Street', 'Kolkata', 'West Bengal');

1 row created.

SQL> insert into Branch values('B03', 3, '15, Salt Lake', 'Kolkata', 'West Bengal');

1 row created.
```

SQL> select * from Branch;

BRANC	MANAGER_ID	STREET	CITY	STATE
B01	1	21, Lane Patia	Bhubaneshwar	Odisha
B02	2	10, Park Street	Kolkata	West Bengal
B03	3	15, Salt Lake	Kolkata	West Bengal

```
SQL> set linesize 500;
SQL> select * from Branch;

BRANC MANAGER_ID STREET                                        CITY                                               STATE
----- ---------- ------------------------------------------------ -------------------------------------------------- --------------------------------------------------
B01          1 21, Lane Patia                                 Bhubaneshwar                                       Odisha
B02          2 10, Park Street                                Kolkata                                            West Bengal
B03          3 15, Salt Lake                                  Kolkata                                            West Bengal
```

SQL> insert into customer values('C01', 1, 'B03', 'Aditi Singh', 'Sector 21, Kolkata');

1 row created.

SQL> insert into customer values('C02', 1, 'B03', 'Ramnath Jha', 'Sector 15, Kolkata');

1 row created.

SQL> insert into customer values('C03', 2, 'B01', 'Govind Singh', 'Kiit Square, Patia, BBSR');

1 row created.

SQL> insert into customer values('C04', 1, 'B02', 'Arvind Mukherjee', 'Sector 3, Kolkata');

1 row created.

SQL> insert into customer values('C05', 3, 'B01', 'Kisan Yadav', 'Khandagiri, Bhubaneshwar');

1 row created.

```
SQL> insert into customer values('C01', 1, 'B03', 'Aditi Singh', 'Sector 21, Kolkata');
1 row created.
SQL>  insert into customer values('C02', 1, 'B03', 'Ramnath Jha', 'Sector 15, Kolkata');
1 row created.
SQL>  insert into customer values('C03', 2, 'B01', 'Govind Singh', 'Kiit Square, Patia, BBSR');
1 row created.
SQL> insert into customer values('C04', 1, 'B02', 'Arvind Mukherjee', 'Sector 3, Kolkata');
1 row created.
SQL>  insert into customer values('C05', 3, 'B01', 'Kisan Yadav', 'Khandagiri, Bhubaneshwar');
1 row created.
```

SQL> set linesize 500;

```
SQL> select * from Customer;

CUSTO BOOK_ISSUED BRANCH_NO                          NAME                           ADDRESS
----- ----------- -------------------------------------------------- ------------------------------------------------
--------------------------------------------------
C01         1 B03                                    Aditi Singh                    Sector 21, Kolkata
C02         1 B03                                    Ramnath Jha                      Sector 15, Kolkata
C03         2 B01                                    Govind Singh                   Kiit Square, Patia, BBSR
C04         1 B02                                    Arvind Mukherjee                 Sector 3, Kolkata
C05         3 B01                                    Kisan Yadav                    Khandagiri, Bhubaneshwar
```

```
SQL> set linesize 500;
SQL> select * from Customer;

CUSTO BOOK_ISSUED BRANCH_NO                          NAME                           ADDRESS
----- ----------- -------------------------------------------------- ------------------------------------------------
C01         1 B03                                    Aditi Singh                    Sector 21, Kolkata
C02         1 B03                                    Ramnath Jha                      Sector 15, Kolkata
C03         2 B01                                    Govind Singh                   Kiit Square, Patia, BBSR
C04         1 B02                                    Arvind Mukherjee                 Sector 3, Kolkata
C05         3 B01                                    Kisan Yadav                    Khandagiri, Bhubaneshwar
```

```
SQL> insert into Issue_status values('I01', '22-DEC-19', 101, 'C05', 'The Three MUskeeters');

1 row created.

SQL> insert into Issue_status values('I02', '28-DEC-19', 102, 'C03', 'Harry Potter');

1 row created.

SQL> insert into Issue_status values('I03', '15-JAN-20', 101, 'C03', 'The Three Muskeeters');

1 row created.

SQL> insert into Issue_status values('I04', '19-JAN-20', 105, 'C01', 'Long Walk to Freedom');

1 row created.

SQL> insert into Issue_status values('I05', '21-JAN-20', 105, 'C04', 'Long Walk to Freedom');

1 row created.

SQL> insert into Issue_status values('I06', '25-JAN-20', 102, 'C05', 'Harry Potter');

1 row created.

SQL> insert into Issue_status values('I07', '25-JAN-20', 102, 'C02', 'Harry Potter');
```

1 row created.

SQL> insert into Issue_status values('I08', '10-FEB-20', 105, 'C05', 'Long Walk to Freedom');

1 row created.

```
SQL> insert into Issue_status values('I01', '22-DEC-19', 101, 'C05', 'The Three MUskeeters');

1 row created.

SQL> insert into Issue_status values('I02', '28-DEC-19', 102, 'C03', 'Harry Potter');

1 row created.

SQL> insert into Issue_status values('I03', '15-JAN-20', 101, 'C03', 'The Three Muskeeters');

1 row created.

SQL> insert into Issue_status values('I04', '19-JAN-20', 105, 'C01', 'Long Walk to Freedom');

1 row created.

SQL> insert into Issue_status values('I05', '21-JAN-20', 105, 'C04', 'Long Walk to Freedom');

1 row created.

SQL> insert into Issue_status values('I06', '25-JAN-20', 102, 'C05', 'Harry Potter');

1 row created.

SQL> insert into Issue_status values('I07', '25-JAN-20', 102, 'C02', 'Harry Potter');

1 row created.

SQL> insert into Issue_status values('I08', '10-FEB-20', 105, 'C05', 'Long Walk to Freedom');

1 row created.
```

SQL> set linesize 1000;
SQL> select * from Issue_status;

ISSUE	ISSUE_DAT	ISBN	CUSTO	ISSUE_BOOK_NAME
I01	22-DEC-19	101	C05	The Three MUskeeters
I02	28-DEC-19	102	C03	Harry Potter
I03	15-JAN-20	101	C03	The Three Muskeeters
I04	19-JAN-20	105	C01	Long Walk to Freedom
I05	21-JAN-20	105	C04	Long Walk to Freedom
I06	25-JAN-20	102	C05	Harry Potter
I07	25-JAN-20	102	C02	Harry Potter
I08	10-FEB-20	105	C05	Long Walk to Freedom

```
SQL> set linesize 1000;
SQL> select * from Issue_status;

ISSUE ISSUE_DAT       ISBN CUSTO ISSUE_BOOK_NAME
----- --------- ---------- ----- --------------------------------------------------
I01   22-DEC-19        101 C05   The Three MUskeeters
I02   28-DEC-19        102 C03   Harry Potter
I03   15-JAN-20        101 C03   The Three Muskeeters
I04   19-JAN-20        105 C01   Long Walk to Freedom
I05   21-JAN-20        105 C04   Long Walk to Freedom
I06   25-JAN-20        102 C05   Harry Potter
I07   25-JAN-20        102 C02   Harry Potter
I08   10-FEB-20        105 C05   Long Walk to Freedom
```

SQL> insert into Return_status values('R01', '21-FEB-20', 105, 'C05', 'Long Walk to Freedom');

1 row created.

SQL> insert into Return_status values('R02', '25-FEB-20', 101, 'C03', 'The Three Muskeeters');

1 row created.

SQL> insert into Return_status values('R03', '29-FEB-20', 105, 'C01', 'Long Walk to Freedom');

1 row created.

SQL> insert into Return_status values('R04', '05-MAR-20', 105, 'C04', 'Long Walk to Freedom');

1 row created.

SQL> insert into Return_status values('R05', '15-MAR-20', 102, 'C02', 'Harry Potter');

1 row created.


```
SQL> insert into Return_status values('R01', '21-FEB-20', 105, 'C05', 'Long Walk to Freedom');

1 row created.

SQL> insert into Return_status values('R02', '25-FEB-20', 101, 'C03', 'The Three Muskeeters');

1 row created.

SQL> insert into Return_status values('R03', '29-FEB-20', 105, 'C01', 'Long Walk to Freedom');

1 row created.

SQL> insert into Return_status values('R04', '05-MAR-20', 105, 'C04', 'Long Walk to Freedom');

1 row created.

SQL> insert into Return_status values('R05', '15-MAR-20', 102, 'C02', 'Harry Potter');

1 row created.
```


SQL> set linesize 500;
SQL> select * from Return_Status;

```
RETUR RETURN_DA      ISBN CUSTO RETURN_BOOK_NAME
----- --------- ---------- ----- --------------------------------------------------
R01   21-FEB-20       105 C05   Long Walk to Freedom
R02   25-FEB-20       101 C03   The Three Muskeeters
R03   29-FEB-20       105 C01   Long Walk to Freedom
R04   05-MAR-20        105 C04   Long Walk to Freedom
R05   15-MAR-20        102 C02   Harry Potter
```

CONCLUSION

• SQL database management application which is very well used in the modern world in organizing and manipulating a database.

• Though SQL doesn't have the GUI interface like Microsoft access is having and they all manage the database comfortable.

• Depending on the user or users, if an organization has multiple users then they should go for SQL server based application.

• This project shows how to create tables in SQL and how to create simple data manipulation language and data definition language with how to execute them.