

Library Management System – Part 2

Description:

Our goal is to design the library database system in Oracle 21c. We will create the tables, columns, and rows of data by writing SQL code using the Oracle query tool. Before all that can happen, we conceptualized our idea for the Library Management System through an E-R diagram.

Our general idea for the system is that this international library system and many libraries are in many countries.

1. As such, we chose the library as an entity that is defined by Library Code, which is its primary key, Library name, and Address (a multivalued attribute).
2. Next, each library contains books and they themselves have authors and publishers, all of which are recognized as entities. Each book is identified by its ISBN/BookID, title, price, status, Book location, and Number of copies.
3. Books are sold to the library by vendors, which is another entity with attributes Name, Ven_code, Ven_Phone.
4. For publishers, we chose to define it by the attributes Pub_code, Pub_Name, Pub_Country, and the Year_of_Publication.
5. The author is identified uniquely by an Auth_ID and attributed by Auth_Name and qualification.
6. The library would require funding. For this, we made Sponsor an entity. Each sponsor has a Sponsor_ID, their own budget percentage, Govt_name, and period.
7. Each library is managed by an Administrator, who can be identified by their Admin_ID, Admin_name, and Admin_phone.
8. Each administrator has a staff working for the library under them. The staff has employee details and personal details. The employee details, A multivalued attribute, contain primary key employee ID, salary, date of employment, and designation.
9. The staff deals with the users or customers which is another entity.
10. The User entity contains the User ID, which identifies each user uniquely from the database. Other attributes include Name, address, and contact which can also uniquely identify a user.
11. The books and users can further be related through the due date or reserve date.
12. While representing the entire system as in an ER diagram, entity participation representation will essentially help understand the participation level of a particular entity with total or partial participation.

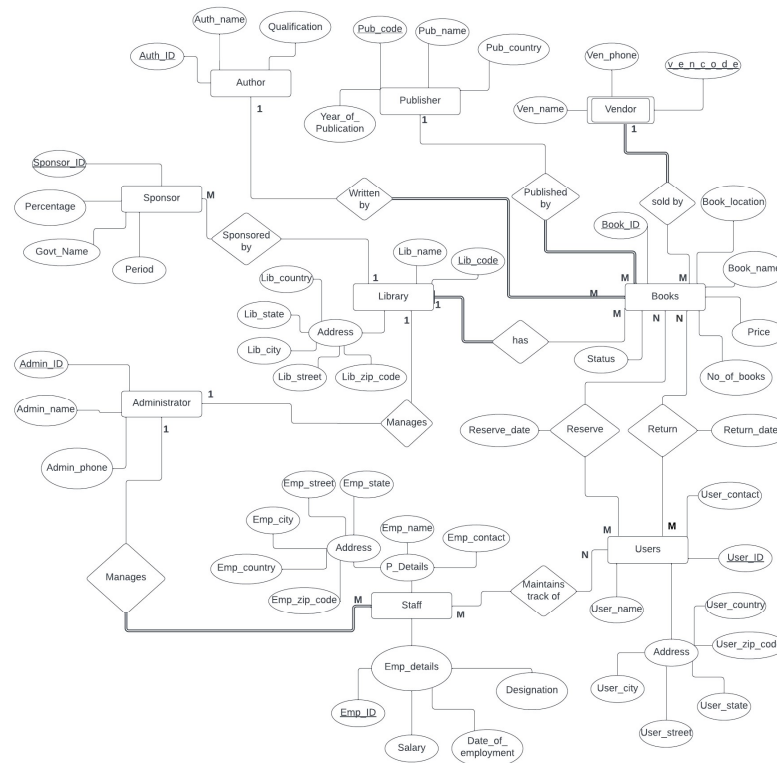
Relationships:

1. Now we will look at the relationships between the entities. Each Library has multiple books thus making it a 1 – to - many relationships.
2. Several users use numerous books which gives a many-to-many relationship between them.
3. The same relation applies to the staff and users.
4. One single administrator manages the staff in one library. For this, the administrator and staff have 1 - to - many relationships in that order.

5. Each library has one administrator which makes it a 1 to 1 relationship.
6. Similarly, a single author/publisher/vendor can write/publish/sell multiple books making all these 1 – to - many relationships.
7. Since we will have users reserving and/or returning books all the time we must keep track of such a transaction which is established with a many-to-many relationship.
8. Generally, staff members will help/guide/assist users based on user's requirements which is a many-to-many relationship.

ER Diagram:

Library Management System



Transformation of ER diagram:

Library (Lib_code, Lib_name, Lib_street, Lib_city, Lib_state, Lib_country, Lib_zip_code)

Books (Book_ID, Book_name, Price, No_of_books, Status, Book_location, Ven_code, Pub_code, Auth_ID, Lib_code, Return_date, Reserve_date)

Administrator (Admin_ID, Admin_name, Admin_phone)

Staff (Emp_ID, Admin_ID, Salary, Date_of_employment, Designation, Emp_name, Emp_contact, Emp_street, Emp_city, Emp_state, Emp_country, Emp_zip_code)

Users (User_ID, User_name, User_contact, User_street, User_city, User_state, User_country, User_zip_code)

Sponsor (Sponsor_ID, Lib_code, Percentage, Govt_Name, Period)

Author (Auth_ID, Auth_name, Qualification)

Publisher (Pub_code, Pub_name, Pub_country, Year_of_publication)

Vendor (Ven_code, Ven_phone, Ven_name)

MaintainsTrackOf(Emp_ID, User_ID)

Reserve (Book_ID, UserID, Reserve_date)

Return (Book_ID, UserID, Return_date)

Oracle Tables:

To create tables we used the queries and the constraints as below:

```
create table Sponsor(  
    Sponsor_ID NUMBER(8) NOT NULL,  
    Lib_code NUMBER(8) NOT NULL,  
    Percentage NUMBER(3, 2) check (Percentage > 0),  
    Govt_name VARCHAR2(25),  
    Period VARCHAR2(15),  
    PRIMARY KEY (Sponsor_ID),  
    FOREIGN KEY (Lib_code) REFERENCES Library(Lib_code)  
);
```

```
create table Author(  
    Auth_ID NUMBER(8) NOT NULL,  
    Auth_name VARCHAR2(25),  
    Qualification VARCHAR2(50),  
    PRIMARY KEY (Auth_ID)  
);
```

```
create table Publisher(  
    Pub_code NUMBER(8) NOT NULL,  
    Pub_name VARCHAR2(25) NOT NULL,  
    Pub_country VARCHAR2(50),  
    Year_of_publication NUMBER(4) check (Year_of_publication >= 1440),  
    PRIMARY KEY (Pub_code)  
);
```

```
create table Vendor(  
    Ven_code NUMBER(8) NOT NULL,
```

```
Ven_name VARCHAR2(25),  
Ven_phone NUMBER(20) NOT NULL,  
    PRIMARY KEY (Ven_code)  
);
```

```
create table Books(  
    Book_ID NUMBER(8) NOT NULL,  
    Ven_code NUMBER(8),  
    Pub_code NUMBER(8),  
    Auth_ID NUMBER(8),  
    Lib_code NUMBER(8),  
    Book_name VARCHAR2(95),  
    Price NUMBER(6, 2) check (Price > 0),  
    No_of_books NUMBER(3) check (No_of_books >= 0),  
    Status VARCHAR2(20) check (Status in ('available','reserved','NA')),  
    Return_date DATE,  
    Reserve_date DATE,  
    Book_location VARCHAR2(50),  
    PRIMARY KEY (Book_ID),  
    FOREIGN KEY (Lib_code) REFERENCES Library(Lib_code),  
    FOREIGN KEY (Ven_code) REFERENCES Vendor(Ven_code),  
    FOREIGN KEY (Pub_code) REFERENCES Publisher(Pub_code),  
    FOREIGN KEY (Auth_ID) REFERENCES Author(Auth_ID)  
);
```

```
create table Library(  
    Lib_code NUMBER(8) NOT NULL,  
    Lib_name VARCHAR2(25),  
    Library_street VARCHAR2(40) NOT NULL,  
    Library_city VARCHAR2(15) NOT NULL,  
    Library_State VARCHAR2(15) NOT NULL,  
    Library_country VARCHAR2(40),  
    Library_zip_code VARCHAR2(9),  
    PRIMARY KEY (Lib_code)  
);
```

```
create table Administrator(  
    Admin_ID NUMBER(8) NOT NULL,  
    Admin_name VARCHAR2(25),  
    Admin_phone NUMBER(20) NOT NULL UNIQUE,  
    PRIMARY KEY (Admin_ID)  
);
```

```
create table Users(  
    User_ID NUMBER(8) NOT NULL,  
    User_name VARCHAR2(25),  
    User_contact NUMBER(20) NOT NULL UNIQUE,  
    User_street VARCHAR2(40) NOT NULL,
```

```
User_city VARCHAR2(15) NOT NULL,  
User_State VARCHAR2(15) NOT NULL,  
User_country VARCHAR2(40),  
User_zip_code VARCHAR2(9),  
PRIMARY KEY (User_ID)  
);
```

```
create table Staff(  
    Emp_ID NUMBER(8) NOT NULL,  
    Emp_name VARCHAR2(25),  
    Emp_contact NUMBER(20) NOT NULL,  
    Salary NUMBER(10,3) check (Salary > 25 and Salary < 999999999),  
    Date_of_employment DATE NOT NULL,  
    Designation VARCHAR2(25),  
    Emp_street VARCHAR2(40) NOT NULL,  
    Emp_city VARCHAR2(15) NOT NULL,  
    Emp_state VARCHAR2(15) NOT NULL,  
    Emp_country VARCHAR2(40),  
    Emp_zip_code VARCHAR2(9),  
    Admin_ID NUMBER(8),  
    PRIMARY KEY (Emp_ID),  
    FOREIGN KEY (Admin_ID) REFERENCES Administrator(Admin_ID)  
);
```

```
create table MaintainsTrackOf(  
    Emp_ID NUMBER(8),  
    User_ID NUMBER(8),  
    PRIMARY KEY (Emp_ID, User_ID)  
);
```

```
create table Reserve(  
    Book_ID NUMBER(8),  
    UserID NUMBER(8),  
    Reserve_date DATE,  
    PRIMARY KEY (Book_ID, User_ID)  
);
```

```
create table Return(  
    Book_ID NUMBER(8),  
    UserID NUMBER(8),  
    Return_date DATE  
    PRIMARY KEY (Book_ID, User_ID)  
);
```

Data Insertion queries:

insert into Sponsor values (10011, 20011, 5, 'govt_xx', 2006-2008);
Insert into Sponsor values (10012, 20012, 7, 'govt_x1', 1993-1999);
Insert into Sponsor values (10013, 20013, 8, 'govt_x3', 2020-2030);
Insert into Sponsor values (10014, 20014, 42.5, 'govt_z', 3000-3033);
Insert into Sponsor values (10015, 20015, 11.1, 'govt_u', 1939-1945);
Insert into Sponsor values (10016, 20016, 2.5, 'govt_s', 1914-1918);
Insert into Sponsor values (10017, 20017, 5.6, 'govt_r', 1888-1898);
Insert into Sponsor values (10018, 20018, 7.3, 'govt_tt', 2010-2015);
Insert into Sponsor values (10019, 20019, 6, 'govt_xy', 2015-2018);
Insert into Sponsor values (10020, 20020, 5, 'govt_xz', 2018-2023);

insert into Author values (90011, 'Leo Tolstoy', 'law and oriental languages');
Insert into Author values (90012, 'Tarantino', 'Cinema');
Insert into Author values (90013, 'Hunter Thompson', 'Journalism');
Insert into Author values (90014, 'Burt Macklin', 'Crime');
Insert into Author values (90015, 'William Shakesphere', 'Playwright');
Insert into Author values (90016, 'Bruce Wayne', 'Crime');
Insert into Author values (90017, 'Frank Herbert', 'SciFi');
Insert into Author values (90018, 'George Orwell', 'Social');
Insert into Author values (90019, 'Tolkein', 'Literature');
Insert into Author values (90020, 'Mark Twain', 'Literature');

insert into Publisher values (80011, 'The Russian Messenger', 'Russia', 1869);
Insert into Publisher values (80012, 'Penguin', 'UK', 1800);
Insert into Publisher values (80013, 'harpercollins', 'US', 1899);
Insert into Publisher values (80014, 'Macmillan', 'UK', 1843);
Insert into Publisher values (80015, 'Hachette', 'Europe', 1992);
Insert into Publisher values (80016, 'Scholastic', 'India', 1989);
Insert into Publisher values (80017, 'Pearson', 'US', 1901);
Insert into Publisher values (80018, 'Mcgraw Hill', 'US', 1900);
Insert into Publisher values (80019, 'Pearson', 'UK', 1954);
Insert into Publisher values (80020, 'Random', 'UK', 1984);

insert into Vendor values (70011, 'Victor', 1234567890);
insert into Vendor values (70012, 'Huey', 1236540987);
insert into Vendor values (70013, 'Duey', 4561237890);
insert into Vendor values (70014, 'Humpty', 1237894560);
insert into Vendor values (70015, 'Dumpty', 3214569999);
insert into Vendor values (70016, 'Deshaun', 9998431234);
insert into Vendor values (70017, 'The Rock', 9408438430);
insert into Vendor values (70018, 'Vlad', 9408436969);
insert into Vendor values (70019, 'Chad', 4086904200);
insert into Vendor values (70020, 'Jennifer', 4567891234);

insert into Library values (20011, 'Sycamore', 'Sycamore St', 'San Antonio', 'Texas', 'US', '78015');
insert into Library values (20012, 'Willis', 'W Prairie St', 'Denton', 'Texas', 'US', '76201');
insert into Library values (20013, 'Discovery Park', 'N Elm St', 'Denton', 'Texas', 'US', '76201');
insert into Library values (20014, 'Library Of Alexandria', 'Ptolemy St', 'Alexandria', 'Athens', 'Greece', '110041');

insert into Library values (20015, 'Library of Congress', 'President St', 'Washington', 'DC' 'US', 111000);
insert into Library values (20016, 'Bodleian', 'Tea St', 'Oxford', 'London', 'UK', 345908);
insert into Library values (20017, 'Yale', 'Teasley St', 'New Haven', 'Connecticut', 'US', 3024050);
insert into Library values (20018, 'Vatican', 'Pope Ln', 'Square', 'Vatican City', 'Rome', 010606);
insert into Library values (20019, 'Boston Public', 'Oak Street', 'Boston', 'Massachusetts', 'US', 690420);
insert into Library values (20020, 'Seattle Central', 'Fry St', 'Seattle', 'Washington', 'US', 420690);

insert into Books values (50011, 70011, 80011, 90011, 20011, 'War and Peace, first edition', 15.03, 12, 'available', NULL, NULL, 'FL_02 RACK33');
insert into Books values (50012, 70012, 80012, 90012, 20012, 'Hells Angels', '19.99', 3, 'Available', 'NULL', 'NULL', 'FL_01 Aisle 4');
insert into Books values (50013, 70013, 80013, 90013, 20013, 'Kitchen Confidential', 21.99, 1, 'Reserved', '27-02-2023', '10-01-2023', 'FL_01 Aisle 2');
insert into Books values (50014, 70014, 80014, 90014, 20014, 'Dune 4th', 10.99, 2, 'Available', 'NULL', 'NULL', 'FL_11 Aisle 6');
insert into Books values (50015, 70015, 80015, 90015, 20015, 'Programming for Dummies', 5.99, 0, 'Reserved', '27-02-2023', '26-02-2023', 'FL_0 Aisle 3');
insert into Books values (50016, 70016, 80016, 90016, 20016, 'College Textbook', 999.89, 1, 'Reserved', '10-05-2023', '10-05-2023', 'FL_00 Aisle1');
insert into Books values (50017, 70017, 80017, 90017, 20017, 'Dune Messiah', 10.99, 10, 'Available', 'NULL', 'NULL', 'FL_10 Aisle 20');
insert into Books values (50018, 70018, 80018, 90018, 20018, 'College Book 2", 1999.99, 0, 'Reserved', '29-02-2023', '29-02-2023', 'FL_01 Aisle 1');
insert into Books values (50019, 70019, 80019, 90019, 20019, 'Murder Handbook', 1.99, 10, 'Available', 'NULL', 'NULL', 'FL_99 Aisle 2');
insert into Books values (50020, 70020, 80020, 90020, 20020, 'Cooking Meth', 59.99, 1, 'Available', 'Null', 'Null', 'FL_69 Aisle 3);

insert into Administrator values (30011, 'A. Alex', 011-098-1234);
insert into Administrator values (30012, 'B. Alex', 012-098-1234);
insert into Administrator values (30013, 'C. Alex', 013-098-1234);
insert into Administrator values (30014, 'D. Alex', 014-098-1234);
insert into Administrator values (30015, 'E. Alex', 015-098-1234);
insert into Administrator values (30016, 'F. Alex', 016-098-1234);
insert into Administrator values (30017, 'G. Alex', 017-098-1234);
insert into Administrator values (30018, 'H. Alex', 018-098-1234);
insert into Administrator values (30019, 'I. Alex', 019-098-1234);
insert into Administrator values (30020, 'J. Alex', 020-098-1234);

insert into Users values (40011, 'K. Christina', 342-675-7979, 'W. Oak', 'San Antonio', 'Texas', 'US', '78015');
insert into Users values (40012, 'A. Chris', 789-675-7979, 'A. Oak', 'San Francisco', 'Bihar", 'US', '76207');
insert into Users values (40013, 'B. Chris', 013-675-7979, 'A. Oak', 'San Francisco', 'Bihar", 'US', '76207');
insert into Users values (40014, 'C. Chris', 014-675-7979, 'A. Oak', 'San Francisco', 'Bihar", 'US', '76207');

```
insert into Users values (40015, 'D. Chris', 015-675-7979, 'A. Oak', 'San Francisco', 'Bihar', 'US', '76207');
insert into Users values (40016, 'E. Chris', 016-675-7979, 'A. Oak', 'San Francisco', 'Bihar', 'US', '76207');
insert into Users values (40017, 'F. Chris', 017-675-7979, 'A. Oak', 'San Francisco', 'Bihar', 'US', '76207');
insert into Users values (40018, 'G. Chris', 018-675-7979, 'A. Oak', 'San Francisco', 'Bihar', 'US', '76207');
insert into Users values (40019, 'H. Chris', 019-675-7979, 'A. Oak', 'San Francisco', 'Bihar', 'US', '76207');
insert into Users values (40020, 'F. Chris', 020-675-7979, 'A. Oak', 'San Francisco', 'Bihar', 'US', '76207');
```

```
insert into Staff values (60011, 'A. Cooper', 011-234-4545, 12345,
TO_DATE('10/10/21','mm/dd/yy'), 'Manager', 'Avenue A', 'San Antonio', 'Texas', 'US', '78015',
30011);
insert into Staff values (60012, 'B. Cooper', 012-234-4545, 12345,
TO_DATE('10/10/21','mm/dd/yy'), 'Manager', 'Avenue A', 'San Antonio', 'Texas', 'US', '78015',
30012);
insert into Staff values (60013, 'C. Cooper', 013-234-4545, 12345,
TO_DATE('10/10/21','mm/dd/yy'), 'Manager', 'Avenue A', 'San Antonio', 'Texas', 'US', '78015',
30013);
insert into Staff values (60014, 'D. Cooper', 014-234-4545, 12345,
TO_DATE('10/10/21','mm/dd/yy'), 'Manager', 'Avenue A', 'San Antonio', 'Texas', 'US', '78015',
30014);
insert into Staff values (60015, 'E. Cooper', 015-234-4545, 12345,
TO_DATE('10/10/21','mm/dd/yy'), 'Manager', 'Avenue A', 'San Antonio', 'Texas', 'US', '78015',
30015);
insert into Staff values (60016, 'F. Cooper', 016-234-4545, 12345,
TO_DATE('10/10/21','mm/dd/yy'), 'Manager', 'Avenue A', 'San Antonio', 'Texas', 'US', '78015',
30016);
insert into Staff values (60017, 'G. Cooper', 017-234-4545, 12345,
TO_DATE('10/10/21','mm/dd/yy'), 'Manager', 'Avenue A', 'San Antonio', 'Texas', 'US', '78015',
30017);
insert into Staff values (60018, 'H. Cooper', 018-234-4545, 12345,
TO_DATE('10/10/21','mm/dd/yy'), 'Manager', 'Avenue A', 'San Antonio', 'Texas', 'US', '78015',
30018);
insert into Staff values (60019, 'I. Cooper', 019-234-4545, 12345,
TO_DATE('10/10/21','mm/dd/yy'), 'Manager', 'Avenue A', 'San Antonio', 'Texas', 'US', '78015',
30019);
insert into Staff values (60020, 'J. Cooper', 020-234-4545, 12345,
TO_DATE('10/10/21','mm/dd/yy'), 'Manager', 'Avenue A', 'San Antonio', 'Texas', 'US', '78015',
30020);
```


Results:

```

SQL> desc Library;
Name                                     Null?   Type
-----
LIB_CODE                               NOT NULL NUMBER(8)
LIB_NAME                               NOT NULL VARCHAR2(25)
LIBRARY_STREET                         NOT NULL VARCHAR2(40)
LIBRARY_CITY                           NOT NULL VARCHAR2(15)
LIBRARY_STATE                          NOT NULL VARCHAR2(15)
LIBRARY_COUNTRY                        NOT NULL VARCHAR2(40)
LIBRARY_ZIP_CODE                       NOT NULL VARCHAR2(9)

SQL> desc Sponsor;
Name                                     Null?   Type
-----
SPONSOR_ID                             NOT NULL NUMBER(8)
LIB_CODE                               NOT NULL NUMBER(8)
PERCENTAGE                             NOT NULL NUMBER(3,2)
GOVT_NAME                              NOT NULL VARCHAR2(25)
PERIOD                                 NOT NULL VARCHAR2(15)

SQL> desc Author;
Name                                     Null?   Type
-----
AUTH_ID                                NOT NULL NUMBER(8)
AUTH_NAME                              NOT NULL VARCHAR2(25)
QUALIFICATION                           NOT NULL VARCHAR2(50)

SQL> desc Publisher;
Name                                     Null?   Type
-----
PUB_CODE                               NOT NULL NUMBER(8)
PUB_NAME                               NOT NULL VARCHAR2(25)
PUB_COUNTRY                            NOT NULL VARCHAR2(50)
YEAR_OF_PUBLICATION                    NOT NULL NUMBER(4)

SQL> desc Vendor;
Name                                     Null?   Type
-----
VEN_CODE                               NOT NULL NUMBER(8)
VEN_NAME                               NOT NULL VARCHAR2(25)
VEN_PHONE                              NOT NULL NUMBER(20)

SQL> desc Books;
Name                                     Null?   Type
-----
BOOK_ID                                NOT NULL NUMBER(8)
VEN_CODE                               NOT NULL NUMBER(8)
PUB_CODE                               NOT NULL NUMBER(8)
AUTH_ID                                NOT NULL NUMBER(8)
LIB_CODE                               NOT NULL NUMBER(8)
BOOK_NAME                              NOT NULL VARCHAR2(25)
PRICE                                  NOT NULL NUMBER(6,2)
NO_OF_BOOKS                            NOT NULL NUMBER(3)
STATUS                                 NOT NULL VARCHAR2(20)
RETURN_DATE                            NOT NULL DATE
RESERVE_DATE                           NOT NULL DATE
BOOK_LOCATION                           NOT NULL VARCHAR2(50)

SQL> desc Administrator;
Name                                     Null?   Type
-----
ADMIN_ID                                NOT NULL NUMBER(8)
ADMIN_NAME                              NOT NULL VARCHAR2(25)
ADMIN_PHONE                             NOT NULL NUMBER(20)

SQL> desc Users;
Name                                     Null?   Type
-----
USER_ID                                NOT NULL NUMBER(8)
USER_NAME                              NOT NULL VARCHAR2(25)
USER_CONTACT                            NOT NULL NUMBER(20)
USER_STREET                             NOT NULL VARCHAR2(40)
USER_CITY                               NOT NULL VARCHAR2(15)
USER_STATE                              NOT NULL VARCHAR2(15)
USER_COUNTRY                            NOT NULL VARCHAR2(40)
USER_ZIP_CODE                           NOT NULL VARCHAR2(9)

SQL> desc Staff;
Name                                     Null?   Type
-----
EMP_ID                                  NOT NULL NUMBER(8)
EMP_NAME                                NOT NULL VARCHAR2(25)
EMP_CONTACT                             NOT NULL NUMBER(20)
SALARY                                  NOT NULL NUMBER(10,3)
DATE_OF_EMPLOYMENT                      NOT NULL DATE
DESIGNATION                             NOT NULL VARCHAR2(25)
EMP_STREET                              NOT NULL VARCHAR2(40)
EMP_CITY                                NOT NULL VARCHAR2(15)
EMP_STATE                               NOT NULL VARCHAR2(15)
EMP_COUNTRY                             NOT NULL VARCHAR2(40)
EMP_ZIP_CODE                            NOT NULL VARCHAR2(9)
ADMIN_ID                                NOT NULL NUMBER(8)

```

```
SQL> select count(*) from Library;
```

```
COUNT(*)
-----
10
```

```
SQL> select * from Library;
```

LTB_CODE	LTB_NAME	LIBRARY_STREET
LIBRARY_CITY	LIBRARY_STATE	LIBRARY_COUNTRY
LIBRARY_Z		
20011	Sycamore	Sycamore St
San Antonio	Texas	US
78015		
20012	Willis	W Prairie St
Denton	Texas	US
76201		
LTB_CODE	LTB_NAME	LIBRARY_STREET
LIBRARY_CITY	LIBRARY_STATE	LIBRARY_COUNTRY
LIBRARY_Z		
20013	Discovery Park	N Elm St
Denton	Texas	US
76201		
20014	Library Of Alexandria	Ptolemy St
Alexandria	Athens	Greece
LTB_CODE	LTB_NAME	LIBRARY_STREET
LIBRARY_CITY	LIBRARY_STATE	LIBRARY_COUNTRY
LIBRARY_Z		
110041		
20016	Bodleian	Tea St
Oxford	London	UK
345988		
20017	Yale	Teasley St
LTB_CODE	LTB_NAME	LIBRARY_STREET
LIBRARY_CITY	LIBRARY_STATE	LIBRARY_COUNTRY
LIBRARY_Z		
New Haven	Connecticut	US
3024050		
20018	Vatican	Pope Ln
Square	Vatican City	Rome
10606		
LTB_CODE	LTB_NAME	LIBRARY_STREET
LIBRARY_CITY	LIBRARY_STATE	LIBRARY_COUNTRY
LIBRARY_Z		
20019	Boston Public	Oak Street
Boston	Massachusetts	US
690420		
20015	Library of Congress	President St
Washington	DC	US
111000		
LTB_CODE	LTB_NAME	LIBRARY_STREET
LIBRARY_CITY	LIBRARY_STATE	LIBRARY_COUNTRY
LIBRARY_Z		
20020	Seattle Central	Fry St
Seattle	Washington	US
420690		

```
10 rows selected.
```

```
SQL> select * from Sponsor;
```

SPONSOR_ID	LIB_CODE	PERCENTAGE	GOVT_NAME	PERIOD
10011	20011	5	govt_xx	-2
10012	20012	7	govt_x1	-6
10013	20013	8	govt_x3	-10
10016	20016	2.5	govt_s	-4
10017	20017	5.6	govt_r	-10
10018	20018	7.3	govt_tt	-5
10019	20019	6	govt_xy	-3
10020	20020	5	govt_xz	-5
10014	20014	4.5	govt_z	-33
10015	20015	1.1	govt_u	-6

10 rows selected.

```
SQL> select * from Vendor;
```

VEN_CODE	VEN_NAME	VEN_PHONE
70011	Victor	1234567890
70012	Huey	1236540987
70013	Duey	4561237890
70014	Humpty	1237894560
70015	Dumpty	3214569999
70016	Deshaun	9998431234
70017	The Rock	9408438430
70018	Vlad	9408436969
70019	Chad	4086904200
70020	Jennifer	4567891234

10 rows selected.

```
SQL> select * from Administrator;
```

ADMIN_ID	ADMIN_NAME	ADMIN_PHONE
30011	J. Alex	5670981234
30012	B. Alex	120981234
30013	C. Alex	130981234
30014	D. Alex	140981234
30015	E. Alex	150981234
30016	F. Alex	160981234
30017	G. Alex	170981234
30018	H. Alex	180981234
30019	I. Alex	190981234
30020	J. Alex	200981234

10 rows selected.

```
SQL> select * from Author;
```

AUTH_ID	AUTH_NAME

QUALIFICATION	

90011	Leo Tolstoy
law and oriental languages	
90012	Tarantino
Cinema	
90013	Hunter Thompson
Journalism	

AUTH_ID	AUTH_NAME

QUALIFICATION	

90014	Burt Macklin
Crime	
90015	William Shakesphere
Playwright	
90016	Bruce Wayne
Crime	

AUTH_ID	AUTH_NAME

QUALIFICATION	

90017	Frank Herbert
SciFi	
90018	George Orwell
Social	
90019	Tolkein
Literature	

AUTH_ID	AUTH_NAME

QUALIFICATION	

90020	Mark Twain
Literature	

```
10 rows selected.
```

```
SQL> select * from Publisher;
```

PUB_CODE	PUB_NAME	
PUB_COUNTRY		YEAR_OF_PUBLICATION

80011	The Russian Messenger	
Russia		1869

80012	Penguin	
UK		1800

80013	harpercollins	
US		1899

PUB_CODE	PUB_NAME	
PUB_COUNTRY		YEAR_OF_PUBLICATION

80014	Macmillan	
UK		1843

80015	Hachette	
Europe		1992

80016	Scholastic	
India		1989

PUB_CODE	PUB_NAME	
PUB_COUNTRY		YEAR_OF_PUBLICATION

80017	Pearson	
US		1901

80018	Mcgraw Hill	
US		1900

80019	Pearson	
UK		1954

PUB_CODE	PUB_NAME	
PUB_COUNTRY		YEAR_OF_PUBLICATION

80020	Random	
UK		1984

```
10 rows selected.
```

```
SQL> select * from Users;
```

USER_ID	USER_NAME	USER_CONTACT
USER_STREET	USER_CITY	USER_STATE
USER_COUNTRY	USER_ZIP_	

40011	K. Christina	3426757979
W. Oak	San Antonio	Texas
US	78015	

40012	A. Chris	7896757979
A. Oak	San Francisco	California
US	76207	

USER_ID	USER_NAME	USER_CONTACT
USER_STREET	USER_CITY	USER_STATE
USER_COUNTRY	USER_ZIP_	

40013	B. Chris	136757979
A. Oak	San Francisco	California
US	76207	

40014	C. Chris	146757979
A. Oak	San Francisco	California

USER_ID	USER_NAME	USER_CONTACT
USER_STREET	USER_CITY	USER_STATE
USER_COUNTRY	USER_ZIP_	

US	76207	
40015	D. Chris	156757979
A. Oak	San Francisco	California
US	76207	

40016	E. Chris	166757979
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USER_ID	USER_NAME	USER_CONTACT
USER_STREET	USER_CITY	USER_STATE
USER_COUNTRY	USER_ZIP_	

A. Oak	San Francisco	California
US	76207	

40017	F. Chris	176757979
A. Oak	San Francisco	California
US	76207	

USER_ID	USER_NAME	USER_CONTACT
USER_STREET	USER_CITY	USER_STATE
USER_COUNTRY	USER_ZIP_	

40018	G. Chris	186757979
A. Oak	San Francisco	California
US	76207	

40019	H. Chris	196757979
A. Oak	San Francisco	California
US	76207	

USER_ID	USER_NAME	USER_CONTACT
USER_STREET	USER_CITY	USER_STATE
USER_COUNTRY	USER_ZIP_	

40020	F. Chris	206757979
A. Oak	San Francisco	California
US	76207	

```
10 rows selected.
```

SQL> select * from Staff;

EMP_ID	EMP_NAME	EMP_CONTACT	SALARY	DATE_OF_C
DESIGNATION	EMP_STREET			
EMP_CITY	EMP_STATE	EMP_COUNTRY		
EMP_ZIP_C	ADDRID			
60011	R. Cooper	6782345678	12345	19-OCT-21
Manager	Avenue A	US		
San Antonio	Texas			
70015	20011			
EMP_ID	EMP_NAME	EMP_CONTACT	SALARY	DATE_OF_C
DESIGNATION	EMP_STREET			
EMP_CITY	EMP_STATE	EMP_COUNTRY		
EMP_ZIP_C	ADDRID			
60012	R. Cooper	122345678	12345	19-OCT-21
Manager	Avenue A	US		
San Antonio	Texas			
70015	20012			
EMP_ID	EMP_NAME	EMP_CONTACT	SALARY	DATE_OF_C
DESIGNATION	EMP_STREET			
EMP_CITY	EMP_STATE	EMP_COUNTRY		
EMP_ZIP_C	ADDRID			
60013	C. Cooper	122345678	12345	19-OCT-21
Manager	Avenue A	US		
San Antonio	Texas			
70015	20013			
EMP_ID	EMP_NAME	EMP_CONTACT	SALARY	DATE_OF_C
DESIGNATION	EMP_STREET			
EMP_CITY	EMP_STATE	EMP_COUNTRY		
EMP_ZIP_C	ADDRID			
60014	D. Cooper	142345678	12345	19-OCT-21
Manager	Avenue A	US		
San Antonio	Texas			
70015	20014			
EMP_ID	EMP_NAME	EMP_CONTACT	SALARY	DATE_OF_C
DESIGNATION	EMP_STREET			
EMP_CITY	EMP_STATE	EMP_COUNTRY		
EMP_ZIP_C	ADDRID			
60015	E. Cooper	152345678	12345	19-OCT-21
Manager	Avenue A	US		
San Antonio	Texas			
70015	20015			
EMP_ID	EMP_NAME	EMP_CONTACT	SALARY	DATE_OF_C
DESIGNATION	EMP_STREET			
EMP_CITY	EMP_STATE	EMP_COUNTRY		
EMP_ZIP_C	ADDRID			
60016	F. Cooper	162345678	12345	19-OCT-21
Manager	Avenue A	US		
San Antonio	Texas			
70015	20016			
EMP_ID	EMP_NAME	EMP_CONTACT	SALARY	DATE_OF_C
DESIGNATION	EMP_STREET			
EMP_CITY	EMP_STATE	EMP_COUNTRY		
EMP_ZIP_C	ADDRID			
60017	G. Cooper	172345678	12345	19-OCT-21
Manager	Avenue A	US		
San Antonio	Texas			
70015	20017			
EMP_ID	EMP_NAME	EMP_CONTACT	SALARY	DATE_OF_C
DESIGNATION	EMP_STREET			
EMP_CITY	EMP_STATE	EMP_COUNTRY		
EMP_ZIP_C	ADDRID			
60018	H. Cooper	182345678	12345	19-OCT-21
Manager	Avenue A	US		
San Antonio	Texas			
70015	20018			
EMP_ID	EMP_NAME	EMP_CONTACT	SALARY	DATE_OF_C
DESIGNATION	EMP_STREET			
EMP_CITY	EMP_STATE	EMP_COUNTRY		
EMP_ZIP_C	ADDRID			
60019	I. Cooper	192345678	12345	19-OCT-21
Manager	Avenue A	US		
San Antonio	Texas			
70015	20019			
EMP_ID	EMP_NAME	EMP_CONTACT	SALARY	DATE_OF_C
DESIGNATION	EMP_STREET			
EMP_CITY	EMP_STATE	EMP_COUNTRY		
EMP_ZIP_C	ADDRID			
60020	J. Cooper	202345678	12345	19-OCT-21
Manager	Avenue A	US		
San Antonio	Texas			
70015	20020			

10 rows selected.

Individual contribution:

Akhil Boga: In this section, I have created the database tables for the Library and Sponsor. The library table represents the single library out of the global database that consists of buildings and houses of books. As such, I have decided to its attributes as, Library code: this is a primary key for this table, library name, street, city, state, country, and zip code. As we can see, the attributes of the library give the complete exact geographical location of each library, which can be identified by their unique library code.

Then, for the sponsor's table, the attributes are Sponsor ID (Primary key), Library code (foreign key), Percentage, Government name, and Period. Sponsors are those institutions that invest or donate to the library. The problem states they are a government institution. Therefore, I have included the necessary attributes like the percentage of shares contributed and the period for which each institution sponsors the library. I have filled the above tables with tuples of values and implemented them in Oracle 21c.

Krishna Praveen V: For part 2, I have worked on creating the tables Author and Vendors. The author table represents the authors of the books available in each library. So, I have filled it with the following attributes: Author ID (Auth_id, which will act as the primary key for Author), Author Name, and Organization. After creating this table in Oracle 21c, I filled it with tuples of values using the "Insert into" query.

The vendor table represents the individual from whom the books are bought. The attributes for this could be Vendor code (Ven_code, primary key), Vendor Phone, and Vendor name. Same as the Author table, I created this table and inserted tuples of values, all in Oracle 21c.

Akhila Battula: I have participated in the group discussion for making necessary changes to the ER diagram. Finalized the new additions and updates to the tables, and relations. Worked on the queries to create and insert data into tables. Since there are references from other tables I had to discuss the data inserted in other tables. For the queries especially, the tables that I had focused on are Books, Publisher for which the select query screenshots are provided in the document submitted.

Navyatha Yamsani: I'm responsible for creating assumptions necessary for an ER diagram to build a Library Management System. Then once after finalizing the ER diagram, worked on the queries to create the tables and data insertion. I have focussed on Administrator, Users, and Maintains_Track_Of tables and inserted the required data and mentioned constraints. Later, performed the queries in "SQL Developer" and was involved in the documentation part.

Rakshith: I have been involved in developing the queries for the creation of tables and data insertion. I have majorly contributed my part in tables – Staff, Reserve, and Return and inserted the data and performed the queries in SQL. I have also been involved in verifying the database and execution of the queries once everything is done so as not to miss anything. I have also been involved in the documentation part.