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.

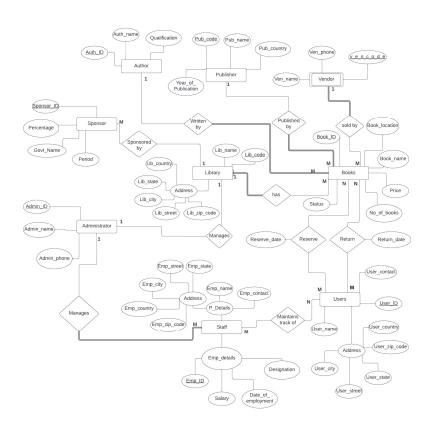
Relationships:

- 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, <u>Ven_code</u>, <u>Pub_code</u>, <u>Auth_ID, Lib_code</u>, Return_date, Reserve_date)

Administrator (Admin_ID, Admin_name, Admin_phone)

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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 (<u>User ID</u>, 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 (<u>Ven code</u>, 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,
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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 < 99999999),
      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 (10020,200
20,5,'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);
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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?	Туре
LIB_CODE LIB_NAME LIBRARY_STREET LIBRARY_CITY LIBRARY_STATE LIBRARY_STATE LIBRARY_COUNTRY LIBRARY_ZIP_CODE	NOT NULL	NUMBER(8) VARCHARZ(25) VARCHARZ(UB) VARCHARZ(15) VARCHARZ(15) VARCHARZ(15) VARCHARZ(16) VARCHARZ(19)
SQL> desc Sponsor; Name	Null?	Туре
SPONSOR_ID LIB_CODE PERCENTAGE GOVT_NAME PERIOD	NOT NULL NOT NULL	NUMBER(8) NUMBER(3) NUMBER(3, 2) VARCHAR2(25) VARCHAR2(15)
SQL> desc Author; Name	Null?	Туре
AUTH_ID AUTH_NAME QUALIFICATION	NOT NULL	NUMBER(8) VARCHAR2(25) VARCHAR2(50)
SQL> desc Publisher; Name	Null?	Туре
PUB_CODE PUB_NAME PUB_COUNTRY YEAR_OF_PUBLICATION		NUMBER(8) VARCHAR2(25) VARCHAR2(50) NUMBER(4)
SQL> desc Vendor; Name	Null?	Туре
VEN_CODE VEN_NAME	NOT NULL	NUMBER(8) VARCHAR2(25)
VEN_PHONE	NOT NULL	NUMBER(20)
SQL> desc Books; Name	Null?	Туре
BOOK_ID VEN_CODE PUB_CODE AUTH_ID LIB_CODE BOOK_NAME PRICE NO_OF_BOOKS STATUS RETURN_DATE RESERVE_DATE BOOK_LOCATION SOL> desc_Administrator;	NOT NULL	NUMBER(8) NUMBER(8) NUMBER(8) NUMBER(8) NUMBER(8) VANCHARZ(25) NUMBER(3) VANCHARZ(20) DATE DATE DATE VARCHARZ(56)
Name	Null?	Туре
ADMIN_IID ADMIN_NAME ADMIN_PHONE		NUMBER(8) VARCHAR2(25) NUMBER(20)
SQL> desc Users; Name	Null?	Туре
USER_ID USER_NAME USER_CONTACT USER_STREET USER_CITY USER_STATE USER_COUNTRY USER_ZIP_CODE	NOT NULL NOT NULL NOT NULL	NUMBER(8) VARCHARZ(25) NUMBER(20) VARCHARZ(40) VARCHARZ(45) VARCHARZ(15) VARCHARZ(15) VARCHARZ(40) VARCHARZ(9)
SQL> desc Staff; Name	Null?	Туре
EMP_ID EMP_NAME EMP_CONTACT SALARY DATE_OF_EMPLOYMENT DESIGNATION EMP_STREET EMP_CITY EMP_STATE EMP_COUNTRY EMP_COUNTRY EMP_CITP_CODE ADMIN_ID	NOT NULL NOT NULL NOT NULL	NUMBER(8) VARCHARZ(25) NUMBER(20) NUMBER(10, 3) DATE VARCHARZ(25) VARCHARZ(25) VARCHARZ(15) VARCHARZ(15) VARCHARZ(15) VARCHARZ(16) VARCHARZ(16) VARCHARZ(16) VARCHARZ(16) VARCHARZ(16) VARCHARZ(16) VARCHARZ(16) VARCHARZ(16)

COL1		<u></u>
SQL> select count(*) from Librar	ry;	
COUNT(*)		
10		
SQL> select * from Library;		
LIB_CODE LIB_NAME		LIBRARY_STREET
LIBRARY_CITY LIBRARY_STATE	LIBR	ARY_COUNTRY
LIBRARY_Z		
20011 Sycamore San Antonio Texas 78015	us	Sycamore St
20012 Willis Denton Texas 76201	us	W Prairie St
LIB_CODE LIB_NAME		LIBRARY_STREET
LIBRARY_CITY LIBRARY_STATE	LIBR	ARY_COUNTRY
LIBRARY_Z		
20013 Discovery Park Denton Texas 76201	US	N Elm St
20014 Library Of Alexandria Alexandria Athens	a Gree	Ptolemy St ce
LIB_CODE LIB_NAME		LIBRARY_STREET
LIBRARY_CITY LIBRARY_STATE	LIBR	ARY_COUNTRY
LIBRARY_Z		
110041		
20016 Bodleian Oxford London 345908	UK	Tea St
20017 Yale		Teasley St
LIB_CODE LIB_NAME		LIBRARY_STREET
LIBRARY_CITY LIBRARY_STATE	LIBR	ARY_COUNTRY
LIBRARY_Z		
New Haven Connecticut 3024050	US	
20018 Vatican Square Vatican City 10606	Rome	Pope Ln
LIB_CODE LIB_NAME		LIBRARY_STREET
LIBRARY_CITY LIBRARY_STATE	LIBR	ARY_COUNTRY
LIBRARY_Z		
20019 Boston Public Boston Massachusetts 690420	US	Oak Street
20015 Library of Congress Washington DC 111000	us	President St
LIB_CODE LIB_NAME		LIBRARY_STREET
LIBRARY_CITY LIBRARY_STATE	LIBR	ARY_COUNTRY
LIBRARY_Z		
20020 Seattle Central Seattle Washington 420690	US	Fry St
10 rows selected.		

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	

VEN_PHONE 1234567890 1236540987
1236540987
4561237890
1237894560
3214569999
9998431234
9408438430
9408436969
4086904200
4567891234

MIN_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

SQL> select	* from Author;
AUTH_ID	AUTH_NAME
QUALIFICATI	CON
	Leo Tolstoy iental languages
90012 Cinema	Tarantino
90013 Journalism	Hunter Thompson
AUTH_ID	AUTH_NAME
QUALIFICATI	CON
90014 Crime	Burt Macklin
90015 Playwright	William Shakesphere
90016 Crime	Bruce Wayne
AUTH_ID	AUTH_NAME
QUALIFICATI	CON
90017 SciFi	Frank Herbert
90018 Social	George Orwell
90019 Literature	Tolkein
AUTH_ID	AUTH_NAME
QUALIFICATI	CON
90020 Literature	Mark Twain
10 rows sel	ected.

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 W. Oak US	3426757979 San Antonio 78015	Texas
40012 A. Chris A. Oak US	7896757979 San Francisco 76207	California
USER_ID USER_NAME	USER_CONTACT	
USER_STREET	USER_CITY	USER_STATE
USER_COUNTRY	USER_ZIP_	
40013 B. Chris A. Oak US	136757979 San Francisco 76207	California
40014 C. Chris A. Oak	146757979 San Francisco	California
USER_ID USER_NAME	USER_CONTACT	
USER_STREET	USER_CITY	USER_STATE
USER_COUNTRYUS	USER_ZIP_ 76207	
40015 D. Chris A. Oak US	156757979 San Francisco 76207	California
40016 E. Chris	166757979	
USER_ID USER_NAME	USER_CONTACT	
USER_STREET	USER_CITY	USER_STATE
USER_COUNTRY	USER_ZIP_	
A. Oak US	San Francisco 76207	California
40017 F. Chris A. Oak US	176757979 San Francisco 76207	California
USER_ID USER_NAME	USER_CONTACT	
USER_STREET	USER_CITY	USER_STATE
USER_COUNTRY	USER_ZIP_	
40018 G. Chris A. Oak US	186757979 San Francisco 76207	California
40019 H. Chris A. Oak US	196757979 San Francisco 76207	California
USER_ID USER_NAME	USER_CONTACT	
USER_STREET	USER_CITY	USER_STATE
USER_COUNTRY	USER_ZIP_	
40020 F. Chris A. Oak US	206757979 San Francisco 76207	California
10 rows selected.		

SQL> select *	from Staff;					
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#### **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.