**Student Projects Chapter 5 - Creating and Manipulating a Relational Database for the Student Project**

Read the sample project steps for this chapter and apply the same techniques to the student project that you are developing.

For the relational schema you developed at the end of Chapter 4 for the project you have chosen, carry out the following steps to implement the design using a relational database management system such as Oracle, SQLServer, or MySQL:

The tables are:

**Member**(memberID, address, areaCode, city, email, firstName, lastName, phoneNumber, state, zip)

**Play**(playID, author, numberOfActs, title, type, numberOfSets)

**Sponsor** (businessName, income)

**Subscriber** (subscriberID, address, areaCode, city, email, firstName, lastName, pastPlays, phoneNumber, state, zip)

**Production** (playID*,* cost, yearOfTheProduction, seasonStartDate, seasonEndDate)

**Performance** (playID, date, time, year)

**TicketSale** (*subscriberID*, *playID,* ticketIncome)

**DuesPayment (**memberID*,* duesPaid, dateofDuesSubmission, duesAmount)

**Donation** ( businessName*,* donationNumber)

**Ticket﻿﻿﻿﻿﻿﻿﻿** (*qrCode*, *subscriberID* playDate, *playNames*, playTime, price, seat, seatNumbers)

* Step 5.1 - Update the data dictionary and list of assumptions as needed. For each table, write the table name and write out the names, data types, and sizes of all the data items, and identify any constraints, using the conventions of the DBMS you will use for implementation.

No changes were made to the list of assumptions. No changes to the listed data items in the data dictionary are needed. For an Oracle database, the tables will have the structures shown below.

**Table Member**

memberID VARCHAR 15 UNIQUE

address VARCHAR 50

areaCode CHAR 3

city VARCHAR 20

email VARCHAR 30

firstName VARCHAR 16 (lastName,firstName) PRIMARY KEY

lastName VARCHAR 20 (lastName,firstName) PRIMARY KEY

phoneNumber VARCHAR 7

state CHAR 2

zip CHAR 5

**Table Play**

playID VARCHAR 15 UNIQUE

author VARCHAR 20

numberOfActs NUMBER 2

title VARCHAR 15 PRIMARY KEY

type VARCHAR 15

numberOfSets VARCHAR 2

**TableSponsor**

businessName VARCHAR 15 PRIMARY KEY

income Number 8,2

**TableSubscriber**

subscriberID VARCHAR 15 PRIMARY KEY

address VARCHAR 50

areaCode CHAR 3

city VARCHAR 15

email VARCHAR 30

firstName VARCHAR 15

lastName VARCHAR 20

pastPlays CHAR 3

phoneNumber CHAR 7 UNIQUE

state CHAR 2

zip CHAR 5

**Table Production**

playID VARCHAR 15 PRIMARY KEY, FOREIGN KEY

cost NUMBER 8,2

yearOfTheProduction CHAR 4 UNIQUE

seasonStartDate DATE UNIQUE

seasonEndDate DATE UNIQUE

**Table Performance**

playID VARCHAR 15 UNIQUE

date DATE PRIMARY KEY

time VARCHAR 10

year CHAR 4 PRIMARY KEY

**Table TicketSale**

subscriberID VARCHAR 15 PRIMARY KEY, FOREIGN KEY

title VARCHAR 30 PRIMARY KEY, FOREIGN KEY

ticketIncome NUMBER 8,2

**Table DuesPayment**

memberID VARCHAR 15 PRIMARY KEY, FOREIGN KEY

duesPaid BOOLEAN PRIMARY KEY

dateofDuesSubmission DATE

duesAmount NUMBER

**TableDonation**

businessName VARCHAR 25

donationNumber VARCHAR 10 PRIMARY KEY

**Table Ticket**

qrCode VARCHAR 10 PRIMARY KEY

subscriberID VARCHAR 15

playDate DATE

playNames VARCHAR 25

playTime VARCHAR 10

price VARCHAR 10

seat CHAR 3

seatNumbers VARCHAR 3

* Step 5.2 - Write and execute SQL statements to create all tables needed to implement the design.

CREATE TABLE Member(

memberID VARCHAR(15),

address VARCHAR(50),

areaCode CHAR(3),

city VARCHAR(20),

email VARCHAR(30),

firstName VARCHAR(16),

lastName VARCHAR(20),

phoneNumber VARCHAR(7),

state CHAR(2),

zip CHAR(5),

CONSTRAINT Member\_mID\_uk UNIQUE (memberID),

CONSTRAINT Member\_Lname\_Fname\_pk PRIMARY KEY (lastName, firstName)

);

CREATE TABLE Play(

playID VARCHAR(15),

author VARCHAR(20),

numberOfActs NUMBER(2,0),

title VARCHAR(30),

type VARCHAR(15),

numberOfSets NUMBER(2),

CONSTRAINT Play\_playID\_uk UNIQUE (playID),

CONSTRAINT Play\_title\_pk PRIMARY KEY (title)

);

CREATE TABLE Sponsor(

businessName VARCHAR(15),

income NUMBER(8,2),

CONSTRAINT Sponsor\_busName\_pk PRIMARY KEY (businessName)

);

CREATE TABLE Subscriber(

subscriberID VARCHAR(15),

address VARCHAR(50),

areaCode CHAR (3),

city VARCHAR(15),

email VARCHAR(30),

firstName VARCHAR(15),

lastName VARCHAR(20),

pastPlays VARCHAR(30),

phoneNumber CHAR(7),

state CHAR(2),

zip CHAR(5),

CONSTRAINT Subscriber\_subID\_pk PRIMARY KEY (subscriberID));

CREATE TABLE Production(

playID VARCHAR(15),

cost NUMBER(8,2),

yearOfTheProduction CHAR(4),

seasonStartDate DATE,

seasonEndDate DATE,

CONSTRAINT Production\_plID\_pk PRIMARY KEY (playID),

CONSTRAINT Production\_plID\_fk FOREIGN KEY (playID) REFERENCES Play(playID)

);

CREATE TABLE Performance(

playID VARCHAR(15),

“date” DATE,

time VARCHAR(10),

year CHAR (4),

CONSTRAINT Performance\_playID\_dte\_year\_pk PRIMARY KEY (playID, “date”, year),

CONSTRAINT Performance\_playID\_fk FOREIGN KEY(playID)REFERENCES Play(playID)

);

CREATE TABLE TicketSale(  
 subscriberID VARCHAR(15),

title VARCHAR(30),   
 ticketIncome NUMBER(8,2),

CONSTRAINT TicketSale\_subID\_pk PRIMARY KEY (subscriberID),

CONSTRAINT TicketSale\_subscriberID\_fk FOREIGN KEY (subscriberID) REFERENCES Subscriber(subscriberID),

CONSTRAINT TicketSale\_plTitle\_fk FOREIGN KEY (title) REFERENCES Play(title)

);

CREATE TABLE DuesPayment(

memberID VARCHAR(15),

duesPaid CHAR(1),

dateofDuesSubmission DATE,

duesAmount NUMBER,

CONSTRAINT DuesPayment\_mID\_duesPaid\_pk PRIMARY KEY(memberID, duesPaid),

CONSTRAINT DuesPayment\_mID\_fk FOREIGN KEY(memberID)REFERENCES Member(memberID)

);

CREATE TABLE Donation(  
 businessName VARCHAR(25),  
 donationNumber VARCHAR(10),

CONSTRAINT Donation\_donNum\_pk PRIMARY KEY(donationNumber)

);

CREATE TABLE Ticket(  
 qrCode VARCHAR(10),

subscriberID VARCHAR(15),  
 playDate DATE,  
 playNames VARCHAR(25),  
 playTime VARCHAR(10),  
 price VARCHAR(10),  
 seat CHAR(3),  
 seatNumbers VARCHAR(3),

CONSTRAINT Ticket\_qrC\_pk PRIMARY KEY(qrCode)

CONSTRAINT Ticket\_subscriberID\_pk PRIMARY KEY(subscriberID)

CONSTRAINT Ticket\_sID\_fk FOREIGN KEY(subscriberID)REFERENCES Subscriber(subscriberID)

);

* Step 5.3 - Create indexes for foreign keys and for any other columns as needed.
* Step 5.4 - Insert at least five records in each table, preserving all constraints. Put in enough data to demonstrate how the database will function.

INSERT INTO Member VALUES ('000001', '345 Stein Rd', '546', 'Tampa', 'judge.aaron@gmail.com', 'Aaron', 'Judge', '6437865', 'FL', '33601');

INSERT INTO Member VALUES ('000002', '23 Garden Way', '718', 'Manhattan', 'lebronnyk@gmail.com', 'Lebron', 'James', '2346432', 'NY', '10001');

INSERT INTO Member VALUES ('000003', '4 Superbowl St','914','Newark', 'objdances@gmail.com', 'Odell', 'Beckham Jr', '7957865', 'NJ','07101');

INSERT INTO Member VALUES ('000004', '5403 Ranger Way','718', 'Manhattan', 'king30@yahoo.com', 'Henrik', 'Lundqvist', '9761002', 'NY', '10001');

INSERT INTO Member VALUES ('000005', '30 Warrior Ave', '415', 'San Francisco', 'wardell@gmail.com', 'Stephen', 'Curry', '1112235', 'CA','94016');

INSERT INTO Member VALUES ('000006', '7 Superbowl St','914','Newark', 'objdances123@gmail.com', 'Mark', 'Beckham Sr', '0012343', 'NY','07101');

INSERT INTO Member VALUES ('000007', '23 Erie St','845', 'Blauvelt', 'smokehouse@yahoo.com', 'Kyle', 'Bailey', '3294849', 'NY', '10913');

INSERT INTO Member VALUES ('000008', '564 Jokers St', '718', 'Staten Island', 'jokerjoe@gmail.com', 'Joe', 'Gatto', '3591013', 'NY','10301');

INSERT INTO Play VALUES ('143', 'Hao Dong', '3', 'Lion King', 'Drama', '20');

INSERT INTO Play VALUES ('213', 'Jimmy Buffett', '3', 'Margaritaville', 'Musical', '32');

INSERT INTO Play VALUES ('658', 'Robin Williams', '3', 'Aladdin', 'Drama', '22');

INSERT INTO Play VALUES ('496', 'Lin Manuel', '3', 'Hamilton', 'Musical', '18');

INSERT INTO Play VALUES ('104', 'Jack Black', '3', 'Rock of Ages', 'Action', '13');

INSERT INTO Play VALUES ('639', 'Elsa Olaf', '2', 'Frozen', 'Musical', '15');

INSERT INTO Play VALUES ('221', 'Joseph Smith', '3', 'Book of Mormon', 'Comedy', '27');

INSERT INTO Play VALUES ('897', 'Patrick Star', '2', 'Spongebob', 'Comedy', '21');

INSERT INTO Sponsor VALUES('McDonalds', '2000.20');

INSERT INTO Sponsor VALUES('Adidas', '14000.00');

INSERT INTO Sponsor VALUES('Under Armour', '5000.60');

INSERT INTO Sponsor VALUES('Hershey', '1000.00');

INSERT INTO Sponsor VALUES('Peanuts', '4543.56');

INSERT INTO Subscriber VALUES ('100001', '1 Marble Ave', '914', 'Hawthorne', 'jadler@gmail.com', 'Jake', 'Adler', 'Aladdin', '9873566', 'NY', '33601');

INSERT INTO Subscriber VALUES ('100002', '4456 E. 53rd Street', '718', 'Manhattan', 'erob234@gmail.com', 'Emily', 'Robinson','Aladdin', '9773126', 'NY', '10001');

INSERT INTO Subscriber VALUES ('100003', '312 Bush Rd','914','Thornwood', 'farriswheel@gmail.com', 'Michaela', 'Farris ','Aladdin','9870000', 'NY','07101');

INSERT INTO Subscriber VALUES ('100004', '5 West 100th St','718', 'Manhattan', 'sanderstim@yahoo.com', 'Timmy', 'Sanders','Margaritaville','4453566', 'NY', '10001');

INSERT INTO Subscriber VALUES ('100005', '2018 Setters Ave', '914', 'Pleasantville', 'rjax1205@gmail.com', 'Rick', 'Jackson','Aladdin','1233212', 'NY','94016');

INSERT INTO Subscriber VALUES ('100006', '212 Pace Ave', '914', 'Pleasantville', 'bonesy@gmail.com', 'Johnny', 'Bones', 'Aladdin', '0009988', 'NY','94016');

INSERT INTO Subscriber VALUES ('100007', '56 Finnerty Rd', '914', 'Pleasantville', 'champ4life@gmail.com', 'Carl', 'Banks','Aladdin','7778877', 'NY',’94016');

INSERT INTO Subscriber VALUES ('100008', '6789 Wilcox Way', '914', 'Pleasantville', 'chrissyrogers@gmail.com', 'Chrissy', 'Rogers','Margaritaville','4445555', 'NY','94016');

INSERT INTO Production VALUES ('213', '40650.00', '2017', '01-Jan-2017', '31-Dec-2017');

INSERT INTO Production VALUES ('658', '31000.00', '2018', '01-Jan-2018', '31-Dec-2018');

INSERT INTO Production VALUES ('104', '25570.00', '2019', '01-Jan-2019', '31-Dec-2019');

INSERT INTO Performance VALUES ('213', '05-May-2017', '6:00 PM', '2017');

INSERT INTO Performance VALUES ('213', '05-Dec-2017', '6:00 PM', '2017');

INSERT INTO Performance VALUES ('658', '09-May-2018', '6:00 PM', '2018');

INSERT INTO Performance VALUES ('658', '12-Dec-2018', '6:00 PM', '2018');

INSERT INTO Performance VALUES ('104', '23-May-2019', '6:00 PM', '2019');

INSERT INTO Performance VALUES ('104', '10-Dec-2019', '6:00 PM', '2019');

INSERT INTO TicketSale VALUES ('100001', 'Rock of Ages', '45.00');

INSERT INTO TicketSale VALUES ('100002', 'Rock of Ages', '45.00');

INSERT INTO TicketSale VALUES ('100003', 'Rock of Ages', '45.00');

INSERT INTO TicketSale VALUES ('100004', 'Rock of Ages', '45.00');

INSERT INTO TicketSale VALUES ('100005', 'Rock of Ages', '45.00');

INSERT INTO Donation VALUES ('Lucios Pizza', '100');

INSERT INTO Donation VALUES ('Sals Pizza', '101');

INSERT INTO Donation VALUES ('Ons', '102');

INSERT INTO Donation VALUES ('Pleasantville Diner', '103');

INSERT INTO Donation VALUES ('Thornwood Diner', '104');

INSERT INTO Ticket VALUES ('123456', '10001', '23-May-2019', 'Rock of Ages', '6:00 PM', '45.00', 'B', '12');

INSERT INTO Ticket VALUES ('123457', '10002', '23-May-2019', 'Rock of Ages', '6:00 PM', '45.00', 'B', '13');

INSERT INTO Ticket VALUES ('123458', '10003', '23-May-2019', 'Rock of Ages', '6:00 PM', '45.00', 'B', '14');

INSERT INTO Ticket VALUES ('123459', '10004', '23-May-2019', 'Rock of Ages', '6:00 PM', '45.00', 'B', '15');

INSERT INTO Ticket VALUES ('123480', '10005', '23-May-2019', 'Rock of Ages', '6:00 PM', '45.00', 'B', '16');

INSERT INTO DuesPayment VALUES('000001', 'Y', '03-Jan-2019', '20.00');

INSERT INTO DuesPayment VALUES('000002', 'Y', '03-Jan-2019', '20.00');

INSERT INTO DuesPayment VALUES('000003', 'N', '', '20.00');

INSERT INTO DuesPayment VALUES('000004', 'Y', '03-Jan-2019', '20.00');

INSERT INTO DuesPayment VALUES('000005', 'Y', '03-Jan-2019', '20.00');

INSERT INTO DuesPayment VALUES('000006', 'N', '', '20.00');

INSERT INTO DuesPayment VALUES('000007', 'Y', '03-Jan-2019', '20.00');

INSERT INTO DuesPayment VALUES('000008', 'Y', '03-Jan-2019', '20.00');

* Step 5.5 - Write SQL statements that will process five non-routine requests for information from the database just created. For each, write the request in English, followed by the corresponding SQL command.

1. Find the average cost of any production the theater has produced so far.

SELECT AVG(cost)

FROM Production;

2. Find subscribers from Pleasantville who last saw the production of Margaritaville.

SELECT firstName, lastName

FROM Subscriber

WHERE pastPlays = 'Rock Of Ages' AND city = 'Pleasantville';

3. Find the members who are not from New York and display their names and the state from which they are from.

SELECT firstName, lastName, state

FROM Member

WHERE state != 'NY';

4. Find all the musical plays where the number of sets is greater than the average number of sets for all plays.

SELECT title

FROM Play

WHERE numberOfSets >= (SELECT AVG(numberOfSets) FROM Play) AND type = 'Musical';

5. Find all sponsors where the donation value is greater than $2,000 and display their name.

SELECT businessName

FROM Sponsor

WHERE income > 2000.00;

* Step 5.6 - Create at least one trigger and write the code for it.

Upon a new Ticket being purchased, the pastPlay of the Subscriber will be updated with the play that the ticket was just purchased for.

CREATE OR REPLACE TRIGGER update\_pastPlays

after insert on TicketSale

for each row

begin

update Subscriber

set pastPlays = :NEW.title

where Subscriber.subscriberID = :NEW.subscriberID;

end;

/

**Creating a new subscriber “100009” where pastPlay = “Margaritaville”**

INSERT INTO Subscriber VALUES ('100009', '6783 Wilcox Way', '914', 'Pleasantville', 'mattrogers@gmail.com', 'Matt', 'Rogers','Margaritaville','4445555', 'NY','94016');

**Query results in “Margaritaville”**

SELECT pastPlays

FROM Subscriber

WHERE subscriberID = 100009;

**Creating a new TicketSale for subscriber “100009” where title = “Rock of Ages”**

INSERT INTO TicketSale VALUES ('100009', 'Rock of Ages', '45.00');

**Query results in “Rock of Ages”**

SELECT pastPlays

FROM Subscriber

WHERE subscriberID = 100009;

