Florida International University
School of Computer Science

COP- 4710 Database Management

Assignment 2
Value: 100 points (7.5% weight of the course)

Due: June 21, 2020, 11:59 PM

PROBLEM 1: WRITE SQL QUERIES **[50]**

In this problem, you are required to write the SQL statements to answer the following queries using PostgreSQL system.

You need to use the COMPANY. The script for the creation and data population for this database (pg_companydb.sql) was already provided in module 4. For that database, answer the following queries. Create the files for all the queries using PostgreSQL (psql or pgAdmin). When a query asks for the "name" of employees, please include both the first and the last names.

1. Retrieve the name and address of each employee that works in the Research department.

2. Retrieve the name and SSN of each employee that either works in department 4 or has a salary lower or equal to $30,000. You can use only one condition term in any WHERE clause; i.e., don't use AND/OR Boolean operations.

3. List the name and SSN of each employee that works on at least one of the projects 1, 2, and 3. You can use only one condition term in any WHERE clause.

4. Retrieve the names of all employees of the Research department who work more than 10 hours per week on the ProductX project.

5. Retrieve the names of all employees who work on all projects [every project] located in either Bellaire or Sugarland. That is, if p1, p2, and p3 are in Bellaire; and p4 and p5 are located in Sugarland; then I want an employee who works on p1, p2, p3, p4, and p5.

6. Find the names of all employees who work on at least one project located in Houston but whose department has no location in Houston.

7. For each department whose average employee salary is more than $30,000, retrieve the department name and the number of male employees working for that department.

8. Retrieve the names of all employees who work in the department that has the employee with the highest salary among all employees.

9. [9A] Create a View ProjectInfo that has the project name, controlling department name, number of employees, and total hours worked per week on the project for each project with more than one employee working on it. [9B] Show the content of this view.

10. [10A] Create a View DepartmentInfo that has the department name, manager name for each department. [10B] Show the content of this view.

Submit a document that contains each query and a screenshot of the result of the queries. Also send the sql files (**one query per file** (name each file Assig2_P1_Q<query_number>.sql)– zip them all) using the Canvas system.

PROBLEM 2: DESIGN A RELATIONAL DATABASE SCHEMA AND IMPLEMENT THE DATABASE. [50]

In this problem, you are required to create a relational database schema and to create and populate a database using DDL and DML. Write all the SQL statements using PostgreSQL system.

1. Design the relational database schema for the ER Diagram of the Car Ride database (problem 1 of assignment 1). You can use Figure 9.2 as an example of a relational database schema. Use the ER-to-Relational Mapping Algorithm for creating this schema.
2. Create the database.
    a. Declare your relations using the SQL DDL.
    b. Include your constraints in the DDL: primary keys, foreign keys, unique values, Default, null, not null, etc.
    c. Include any necessary column that is missing in the data provided that was included in the original ER Diagram, for example Passenger ID or add any other necessary primary key
    d. Add any necessary table that can improve the design of the database and make it more efficient.
3. Populate the database.
    a. Populate the database using SQL DML.
    b. Use the provided data in order to populate the database.
    c. Avoid any possible data duplication.
4. Answer the following questions using SQL queries and show the results via postgreSQL (psql or pgAdmin):
    a. List the passenger first name and last name, car make, car model, car color, driver name and last name, pickup date and time of the passengers with bookings.
    b. List the name and last name, email and cellphone number of passengers that have not used the service yet.
    c. List the first name and last name of the drivers that have not worked at all.
    d. List the origin and destination of the most popular trip.
5. Create 5 queries that will be useful for retrieving data from this database. Specify the queries and get a screenshot of the results.
6. Other questions:

    a. How can you improve the database in order to keep the original price paid per ride in case that the prices of trips change in the future? You can optionally implement this.
    b. How can you improve the database in order to handle drivers that drive more than one car? You can optionally implement this.

Create a single sql for the creation and population of the airline database. For example:
create_airline_db.sql

Submit a document that contains each query and a screenshot of the result of the queries that you create. Also send the sql files (**one query per file** (name each file Assig2_P2Q<query_number>.sql)– zip them all) using the Canvas system.

You can submit all the files from this assignment in one single zip file with the name of the file using this format: "xyzassignment2" (xyz are your initials) using the canvas system. Embed any graph in the document.
Use this information to insert data in the database:

PASSENGER

FName	LName	Street	City	State	ZipCode	CellPhone	Email
Anne	Roberts	123 Thomas St.	Toledo	OH	57556	801-556-2239	AR@test.com
Robert	Schulls	234 Pines St.	Los Angeles	CA	34898	801-552-2943	RoSh@test.com
John	Peters	345 Star St.	Raleigh	NC	79999	801-393-2230	JPet@test.com
Bryan	Brown	435 Palm St.	Miami	FL	30533	801-933-2320	Bryan1@test.com
Mark	Williams	348 Andrew St.	Fort Lauderdale	FL	33318	801-343-2320	mw@test.com
Carol	Phillips	395 Pine St.	Omaha	NE	88899	801-323-2320	carolp@test.com
Madison	Parker	285 Diamond St.	San Diego	CA	99977	801-493-2203	NULL
Justin	Colano	223 Easy St.	Tampa	FL	66798	801-193-2320	JCol@test.com
Claudia	Stevens	775 Main St.	Saint Louis	MO	99878	801-303-2222	ClauS@test.com
Arthur	Hooper	456 Rose St.	Las Vegas	NV	17878	313-912-2101	ahoop@test.com
Sergio	Ryan	567 Spruce St.	Lincoln	NE	87898	801-228-6729	sergior@test.com
Julia	Maverick	678 Tulip St.	Raleigh	NC	79999	313-888-2497	NULL
Brandon	Gordon	789 First St.	Miami	FL	30533	754-111-1111	bgor@test.com
Maurice	Vernon	49s Mark St.	Hollywood	FL	33252	954-954-9541	NULL

PAYMENT

ID	PaymentType	CardNum	ExpiryDate
001	CreditCard	546876546546	07/24
002	CreditCard	865498479879	01/23
003	CreditCard	064068489999	07/25
004	CreditCard	540654865761	08/27
005	CreditCard	464899843110	10/26
006	CreditCard	648984946554	11/27
007	CreditCard	654898988788	03/23
008	CreditCard	654899879788	04/28

DRIVER

Name	License	Email
John Jones	4690000	jj@test.com
Albert Peters	4585000	alpet@test.com
Carl Rowe	3115000	carlr@test.com
Jose Mejia	4925000	Jose.mejia@test.com
William Gates	4650000	wg@test.com
Robert Clark	4445000	rc@test.com
Joseph Warnock	9950000	jwarn@test.com
Lisa Stuart	1475000	Lisa2020@test.com
Peter Rose	1268645	pr@test.com
Vanessa Rogers	8865465	vrogers@test.com

CAR

ID	Registration	Make	Model	Color	Type	Driver
1001	5608936145	Chevrolet	Cruze	Silver	Sedan	Lisa Stuart
1002	6854968665	Ford	Fusion	Blue	Sedan	William Gates
1003	8887946455	Toyota	Corolla	Silver	Sedan	Carl Rowe
1004	8946546564	Honda	Civic	Black	Mini	Albert Peters
1005	8979806546	Honda	Accord	Green	Sport	Joseph Warnock
1006	9840654064	Honda	Accord	Black	Sedan	John Jones
1007	4066545654	Toyota	Camry	Green	Sport	Vanessa Rogers
1008	8981310366	Chevrolet	Traverse	Navy	Sport	Jose Mejia
1009	7787413154	Toyota	Corolla	Red	Mini	Peter Rose
1010	5086455000	Ford	Scape	Red	Sedan	Robert Clark

TRIP

ID	Origin	Destination	Est. Time	Price
001	For Lauderdale	Sunrise	20:50	25.00
002	Aventura	Hollywood	15:00	15.00
003	Hialeah	Miami Beach	30:00	40.00
004	South Beach	Downtown Miami	17:14	27.00
005	Pembroke Pines	Weston	15:14	14.00
006	Miami Airport	El Doral	23:53	18.00
007	Kendall	El Doral	32:00	30.00
008	Downtown Miami	Wynwood	10:19	22.00
009	Brickell	Little Havana	16:00	27.00
010	Coral Way	El Doral	20:00	25.00
011	Dania Beach	Hollywood	10:00	12.00
012	Cooper City	Miramar	18:00	23.00

013	Miramar	Coral Spring	25:00	28.00
014	Coconut Creek	Coral Spring	18:10	22.00
015	Lauderhill	Miramar	25:10	27.00
016	Margate	Tamarac	10:00	15.00
017	Davie	Fort Lauderdale	27:00	30.00

BOOKING

Passenger	CAR ID	Trip ID	DateTimePicked	Payment Mode	Payment ID
Madison Parker	1002	006	03/03/2020 10:00 AM	Cash	NULL
Bryan Brown	1006	001	03/15/2020 03:25 PM	CC	001
Arthur Hooper	1002	007	03/25/2020 08:15 PM	CC	002
Sergio Ryan	1001	010	04/07/2020 02:00 PM	CC	003
Brandon Gordon	1007	007	04/09/2020 05:00 PM	CC	004
Madison Parker	1010	006	04/11/2020 08:00 AM	Cash	NULL
Mark Williams	1002	008	04/11/2020 03:20 PM	CC	005
Carol Phillips	1003	003	04/11/2020 11:00 PM	CC	006
Justin Colano	1004	007	04/22/2020 09:00 PM	CC	007
Claudia Stevens	1005	005	04/28/2020 01:33 PM	CC	008
Julia Maverick	1002	006	04/29/2020 03:40 PM	Cash	NULL
John Peters	1009	006	05/01/2020 07:00 AM	Cash	NULL
Carol Philips	1010	010	05/01/2020 04:00 PM	CC	007
Mark Williams	1011	006	05/02/2020 11:00 AM	Cash	NULL
Anne Roberts	1006	015	05/10/2020 07:00 PM	Cash	NULL

Notes:

- This data is not necessarily a database state. It is just data to insert in the database.
- If you are planning to use auto increment columns for some tables columns like for example a possible passenger_id, you can read a quick tutorial on how to use serial to create auto-increment columns here.

Good luck!