Assignment 2: Table Creation, Relational Algebra & SQL

Raymond Law
CS 085

Part 1 – Table Creation
Create a file aquapark.sql using a text editor.
As you go through part 1, save all working queries to this file.
For each SQL query composed leave a comment describing it.
Comments are denoted by slash asterisk and ended with asterisk slash, as seen below.

```
/*
This table something is composed of ...
The primary key is ...
*/
CREATE TABLE something (
...
);
```

You will be developing a database for a national aquarium chain which has to manage 6 pieces of data.
Using SQL create 6 tables:

cs85_assignment2_aquapark_aquarium
cs85_assignment2_aquapark_tank
cs85_assignment2_aquapark_marine_life
cs85_assignment2_aquapark_feed_type
cs85_assignment2_aquapark_marine_specialist
cs85_assignment2_aquapark_show

Relationships

Each aquarium has many tanks.
Each tank belongs to exactly one aquarium.
Each marine life lives in a tank.
A tank can house multiple marine life.
Each marine life has one type of feed.
Each feed type can be eaten by multiple marine life.

Each aquarium hires multiple marine specialists
Each marine specialists belongs to exactly one aquaium.
A show consists of exactly one marine life and exactly one marine specialist.

Attributes Required (Not a Complete List)

A aquarium is composed of SquareFt, HighTemp, LowTemp, AverageTemp, AverageHumidity, and MovieTheatreAvailable
A marine specialist is composed of FirstName, LastName, Salary, and Specialty
A tank is composed of a SquareFt, Location, Description, and IsCompletelySubmerged
A marine life is composed of Name, Classification, Age, and Health
A feed type is composed of Name, Calories, Location, Quantity.
A show has a Date, Description, as well as information regarding the performers.

Not all required attributes are included, add attributes to satisfy all given conditions and relationships. (You NEED to add additional columns) You will decide appropriate data types for each attribute, make sure to explain your decision in the comment. Obvious explanations (like VARCHAR for FirstName) can be skipped. You will need to determine any primary keys necessary, if the given attributes are not enough to determine a unique value, you may add a surrogate key (You may name this anything you want).

For each table insert at least five rows of relevant data.
Save these insert queries to aquapark.sql.

Part 2 – Relational Algebra & SQL
Download both cs85_assignment2_bazaar.sql and cs85_assignment2_bazaar_queries.sql locally.
Upload cs85_assignment2_bazaar.sql to venus.
Using mysql batch mode run all the code inside cs85_assignment2_bazaar.sql
Login to mysql normally and confirm that you have 6 new tables:

cs85_assignment2_merchant
cs85_assignment2_permit
cs85_assignment2_businesstype
cs85_assignment2_business
cs85_assignment2_lot
cs85_assignment2_reservation

Open cs85_assignment2_bazaar_queries.sql in a text editor. For each request in the file:
Write the Relational Algebra query that solves it, then write the SQL that solves it.
Save the SQL in the cs85_assignment2_bazaar_queries.sql file in the space provided right under the request. You may submit the relational algebra in any format you prefer. (Word, Pen/Paper Scan, Hard Copy)

To ensure that you know how natural joins differ from cartesian product, for the first five queries, you may not use NATURAL JOIN

For this part if you can solve 9/10 Queries you will receive full credit.

Scenario

The Bizarre Bazaar of Bahia Brazil. The biggest flea market in the world where almost anything can be found. The bazaar is set up to allow many merchants to use. A merchant must register and get a MerchantID before they can sell. For a MerchantID all they must disclose is their Last Name, and First Name. A merchant can have many Businesses. Each business belongs to one merchant. For better classification, taxing, and searching purposes, each business, must fall into one of the given business types. Certain business's like food vending and tobacco, require special permits that the Merchant must get, these permits eventually expire and must be renewed. When a permit is renewed the existing expiration is just overwritten. The Bazaar has many lots available for rent, each one has a lot number. Some lots even have electricity. A lot can be rented daily. Each lot allows one business to use it each day. If a merchant prefers a particular lot, they may place a reservation for it for a given day.

Queries

Natural Joins Disallowed

1. Find all businesses who reserved a lot with more than 490 SquareFt and No Electricity. Display BusinessName, LotNumber, SquareFt, ReservationDate, and DailyFee.
2. Find all Merchants that have a business of type "Packaged Food Vendor" Display MerchantID, BusinessName, LastName, and FirstName.
3. Find the owner of all valid (not expired) permits as of 2014. Display LastName, FirstName, PermitType, Expiration, and PermitInformation.
4. Find out which merchants booked a reservation for July 4th, 2013. Show FirstName, LastName, BusinessName, and BusinessType.
5. Find all businesses that do not need a permit. Display BusinessName and BusinessType.

Natural Joins Allowed

1. Find all Reservations made by "Marion Moon" on lots without electricity. Display LotNumber, DailyFee, and ReservationDate.
2. Find all Business that have not made a Reservation for April 2nd 2013. Display BusinessID, BusinessName, BusinessType.
3. Find all reservations made by Merchant "Kara Boyette" between January 3, 2013 and October 27, 2013. Display LotNumber, ReservationDate, and DailyFee.
4. Find all lots that are unreserved for July 9th, 2014. Display LotNumber, SquareFt, DailyFee, and Electricity.
5. Difficult! Find all merchants that have a business that requires a permit, that they do not have. Display MerchantID, BusinessName, BusinessType and PermitRequired.

Submission

Email csci085@gmail.com with your submission.
You should have 3 files, aquapark.sql, a file with you relational algebra,
and cs85_assignment2_bazaar_queries.sql. Do not send the cs85_assignment2_bazaar.sql

Subject: CS085 – REPLACE_WITH_YOUR_NAME – Assignment 2