L&I SCI 410 Final Exam

This Final is an open-book, take-home exam worth 100 points. You have all week to complete the exam. Get started early to avoid last-minute technical snags.

You are free to refer to MySQL Reference Manual, W3C Schools SQL tutorial, and lecture notes for the exam. However, you are not allowed to discuss the exam with anybody. Evidence of collaboration will earn you a zero grade.

The exam has two sections. Section 1 comprises 10 mandatory questions worth 100 total points. Section 2 includes two optional questions worth 5 bonus points each.

Your answer to each question will typically comprise a SQL script and "tabular" output. Do not provide unsolicited information such as columns of a table that are irrelevant to the question. Once you have reviewed your answers, save your work as FinalExam_YourFullName. Submit your completed Final to the designated dropbox on D2L by 11:59pm on Sunday.

1. Build and populate three tables for a LuckyTire database: Tire, Customer, and Sales. The tables should have the following design.

Tire Table Design

Column Name	Data Type	Size	Description
TireID	Int		Primary Key
ModelName	Varchar	25	
Manufacturer	Varchar	20	
UnitPrice	Decimal	Precision = 5 Scale=2	
Type	Varchar	12	

Customer Table Design

Column Name	Data Type	Size	Description
CID	Int		Primary Key
FName	Char	20	
LName	Char	20	
Address	Varchar	40	
City	Varchar	25	
State	Varchar	2	
Zip	Varchar	5	
Phone	Varchar	14	
Make	Varchar	15	
Model	Varchar	20	
Year	Int	4	

Sales Table Design

Column Name	Data Type	Size	Description
InvoiceNumber	Int		Primary Key
Date	Date		
CID	Int		Foreign Key
TireID	Int		Foreign Key
Quantity	Int		

1a. Include your CREATE TABLE scripts (3 points). Verify the creation of the three tables with the DESCRIBE command. Include the outputs of the three DESCRIBE commands (3 points). Populate the three tables with the following data.

Data for Tire Table

TireID	Model Name	Manufacturer	Unit Price	Type
01	Touring	Larson	19.99	Passenger
02	Assurance	GoodTread	24.99	Passenger
03	Heavy Duty	Dunlop	29.99	Truck
04	Smooth	MRF	25.49	SUV
05	Flash	Larson	44.99	Van
06	Voyager	GoodTread	35.50	SUV
07	Explorer	MRF	40.00	Truck
08	Viking	AllStar	30.99	SUV

Data for Customer Table

CID	FName	LName	Address	City	State	Zip	Phone	Make	Model	Year
50125	Kevin	Sullivan	27 W G St #3	Ontario	CA	91762	909-555-0965	Ford	F-150	2006
50168	Pria	Patel	3394 N 6th St #3	Upland	CA	91785	909-555-1266	BMW	325	2004
50173	Will	Leung	6 Vincente Ave	Claremont	CA	91711	909-555-6603	Toyota	Rav-4	2004
50178	Angel	Gonzales	658 Benito St	Ontario	CA	91764	909-555-0997	Dodge	Neon	2006
50187	Mike	Lee	13756 Redwood Ave	Chino	CA	91710	909-555-4352	Toyota	Prius	2008
50193	Phan	Khai	67 N Ukiah Way	Upland	CA	91786	909-555-1236	Dodge	Caravan	2007
50197	Angel	Lopez	98 Sheridan St	Upland	CA	91786	909-555-3522	Chevrolet	Silverado	2006
50198	Luis	Alvarez	34 Kumquat Place	Montclair	CA	91763	909-555-2323	Toyota	Camry	2008
50201	Nguyen	Cuong	79 Coalinga Ave	Montclair	CA	91763	909-555-2135	Saturn	Sky	2009
50211	Sara	Jackson	5 Alamitos St	Montclair	CA	91763	909-555-8863	Chevrolet	Silverado	2002
50219	Daniel	Saadi	32 W Rosewood Ct	Montclair	CA	91763	909-555-2776	Ford	Focus	2009
50230	Ed	Baig	5687 E Walnut Ave	Chino	CA	91710	909-555-1032	Honda	Accord	2004
50231	Tony	Guerrero	12 N Jasmine Ave	Montclair	CA	91763	909-555-8701	Nissan	Sentra	2004
50233	Anna	Lim	18 Winn Dr	Upland	CA	91786	909-555-1778	Honda	Prelude	2002
50234	Cathy	Ng	9088 Holt Blvd Apt #243	Ontario	CA	91762	909-555-1107	Honda	Accord	2009
50244	Cathy	Lam	4803 Granada Ct	Chino	CA	91710	909-555-0567	Chevrolet	Corvette	2007
50257	Juan	Hernandez	4255 San Vincente St	Chino	CA	91710	909-555-4435	Volkswagon	Golf	2007
50266	Sofia	Garcia	13 E La Deney Ct	Ontario	CA	91764	909-555-2783	Volkswagon	Beetle	2005
50273	Jennifer	Kidd	2321 San Berardino St	Montclair	CA	91763	909-555-2144	Suburu	WRX	2008
50295	Raj	Malik	25A W Princeton St	Montclair	CA	91763	909-555-0543	Dodge	Durango	2008
50323	Charlie	Bahn	18 Chaffee St	Upland	CA	91786	909-555-4448	Hyundai	Elantra	2004
50345	Angela	Smith	112 E 4th St	Ontario	CA	91764	909-555-2353	Honda	Civic	2001
50564	Maria	Agbayani	101 W E St	Upland	CA	91762	909-555-2161	Dodge	Caravan	2007

Data for Sales table

InvoiceNumber	Date	CID	TireID	Quantity
77340	5/5/2010	50173	03	1
77341	5/5/2010	50211	04	1
77342	5/6/2010	50345	02	4
77343	5/6/2010	50231	05	2
77344	5/6/2010	50168	06	1
77345	5/6/2010	50125	07	1
77346	5/7/2010	50233	04	4
77347	5/8/2010	50198	02	4
77348	5/9/2010	50244	06	1
77349	5/10/2010	50178	02	4
77350	5/10/2010	50273	03	1
77351	5/10/2010	50125	07	2
77352	5/10/2010	50187	03	3
77353	5/10/2010	50564	01	2
77354	5/10/2010	50266	05	2
77355	5/12/2010	50211	04	1
77356	5/13/2010	50168	06	1
77357	5/13/2010	50168	06	1
77358	5/15/2010	50173	03	1
77359	5/16/2010	50187	05	1
77360	5/16/2010	50193	03	3
77361	5/16/2010	50197	07	1
77362	5/17/2010	50201	05	2
77363	5/17/2010	50201	07	2
77364	5/17/2010	50219	01	2
77365	5/17/2010	50219	01	2
77366	5/17/2010	50230	02	2
77367	5/17/2010	50234	03	1
77368	5/19/2010	50234	04	3
77369	5/19/2010	50257	05	1
77370	5/21/2010	50295	05	4
77371	5/22/2010	50323	04	1

1b. Include the INSERT INTO scripts for the first and the last row in each of the three tables (3 points). Verify the data population of the three tables with the SELECT * command (3 points).

2. Add a new record to the Tire table with the following values: TireID=09; ModelName=LXR213; Manufacturer=Ceat; UnitPrice=45.50; Type=SUV. Include the successfully executed script (3 points). Verify the addition of this new row of data in the Tire table using a select command. Include its output (3 points)

3. Change the phone number for Mike Lee to 515-555-9981 and change Maria Agbayani's street address to 1010 W E St #403 in the Customer table. Include the successfully executed scripts (6 points). Verify the modifications in the table through a select command. Include its output (3 points).

4. Display the names of all cities where LuckyTire has at least 2 customers, along with each city's number of customers. Use GROUP BY and HAVING clauses in your script. Include the successfully executed script along with its output. (8 points)

5. Display all Sales records except for TireID's 01, 03, 05, and 07 using the IN operator, with dates in YYYY/DD/MM format. Include the successfully executed script along with the output. (12 points)

6. Display the names of cities where LuckyTire operates (as "City") and customer populations (as "Number of Customers"). Note that a city's Customer population will be the total number of customers who live there. Include the successfully executed script, along with its output. (12 points)

7. Display full names and phone numbers of LuckyTire customers who own the same make of car as Cathy Ng, in order by first name. Include the successfully executed script and its output. (5 points)

8. Display the full names and phone numbers of customers from Ontario arranged alphabetically under column headers "Ontario Customers" and "Contact Numbers". Include the successfully executed script and its output. (12 points)

9. Display names of all manufacturers in the Tire table (as "Tire Maker") and corresponding sales figures (as "Earnings"). Arrange the records alphabetically by manufacturer name. Note that a manufacturer's sales figure will be the total revenue generated from the sale of its tires. Include the successfully executed script along with the output. (12 points)

10. Display the Full names of customers who use the Assurance tire (TireID 02), along with their street addresses, cities, and zip codes. Sort the records in descending order by Zip. Include the successfully executed script along with the output. (12 points)

SECTION 2: Optional Questions (Total 10 Bonus Points)

1. Delete all records that correspond to Tire ID 08 from the Tire table. Include the script that you executed successfully (2 points). Verify the deletion of the record with a select command. Include its output. (2 points)

2. Display all fields from the Tire and Sales tables (without any duplication) that correspond to TireID's 01 through 05 using a Join. Include the successfully executed script and its output. (6 points)