Concordia University
Department of Computer Science and Software Engineering
Comp 353 - Databases
Summer 2023

Assignment 1
Submission through Moodle is due by July 16th, 2023 at 23:55

Heads-Up

- All assignments must be completed and submitted individually.
- You must submit the answers to all the questions. However, only one or more questions, possibly chosen at random, will be corrected and will be evaluated to the full 50 marks.
- Download the **Expectation of Originality form**, fill out, sign and include it as page 1 of your solution to assignment 1.

Question 1 (50 marks)

You are provided below a design of a relational database for a non-profit organization that is concerned with the welfare of poor people in your community. It accepts donations from people. Donations could be either money or products. It processes the items and sells them to the local people who are interested in them. Part of the donations are used to cover the expenses to run the organization and the rest is used to help poor people in the community. The database contains information about Donors, Donations, Products, Sales and SalesItems.

Donors is the relation that holds information about the people who donate to the organization. Every donor has an ID, first-name, last-name, middle-initial, date-of-birth, address, gender, phone-number, email-address, and social security number.

Donations is the relation that holds information about each donation. Every donation has an ID, the donor ID, date of the donation, type of donation, and amount of donation.

Products is the relation that holds information about every item donated. Every product has an ID, the description of the product, the donation date of the product, the selling price of the product, the weight (in Kilogram) of the product, and a flag indicating whether the product is in stock or has been sold.

Sales is the relation that holds the information about the items sold. Every sale has an ID, date of the sale, amount of the sale, total weight (in kilogram) of the sale, and the delivery fee if the sale is to be delivered.

SalesItems is the relation that holds the information about the items sold for every sale.

Some information about how this organization runs:

- A donation type can be either money or products.
- If the donation is products, then the estimated selling price of all the donated products is registered.
- A donor can have many donations throughout the year.
- One sale can include one or many products.
- The total amount of all products sold in one sale is registered.
- Every item that is sold is flagged to be sold.
- A sale can be either picked up directly by the buyer or delivered to the buyer's address.
- If a sale is delivered, then an extra charge of 5.00$ per kilogram is added to the total price of the sale.

The database schema is as follows, where the underlined attribute(s) in each relation collectively form the primary key of that relation:

1. Donors (donorID, firstName, lastName, middleInitial, dateOfBirth, address*, city, postalCode, province, gender, SSN)
2. Donations (dID, donorID, date, type, amount)
3. Products (pID, description, date, price, weight)
4. Sales (sID, date, amount, deliveryFee**)
5. salesItems(sID, pID)

* Address consists of civic number.

** deliveryFee is set to 0 if the sales is picked up directly by the buyer, or it holds the value of the delivery fee for the sales.

Part I (25 points):

a) Write SQL "CREATE TABLE" statements for the above schema using appropriate data types for the various attributes. [10 points]

b) A declaration to alter the Donors relation schema by deleting the attribute middleInitial. [2 points]

c) A declaration to alter the Donors relation schema by adding attributes phone and email. Use Unknown as the default value for these attributes. [2 points]

d) Provide three INSERT statements with data that will populate the table Products [3 points]

e) Provide SQL statements that delete all data that you populated in table Products. [3 points]

f) Provide several SQL statements that delete all tables that you created in the database. [5 points]

Part II (25 points):

Express the following queries in **SQL:**

a) List the information of all the female Donors that live in the province of Québec. Information includes donorID, first name, last name, date of birth, phone, email, and SSN.

b) Give details of all the products that were delivered on July 1st, 2023. Details include sale ID, product ID, description, price, weight.

c) Give the total amount of delivery fees that have been paid in the month of June of 2023.

d) Give a monthly report of sales for 2022. The report includes for every month in 2022, the total number of sales, the total amount of sales, and the total amount of the delivery fees.

e) For every Donor who lives in the city of Montréal, give the total amount of donations she/he donated in 2022. Results should be displayed in ascending order by gender, then by last name then by first name.

Question 2 (0 marks)

The purpose of this question is to appreciate the high-level programming interface provided by a DBMS.

Write a program in C or Java to create and manipulate the four relations in question 1.
Your program should return all information (donor ID, first name, last name, date of birth, phone, email, gender, and SSN) about donors who live in Brossard.

Comment on the advantages and disadvantages of these two solution approaches (SQL vs C/Java), in terms of the number of efforts involved in programming, debugging, testing, and maintenance.