Concordia University
Department of Computer Science and Software Engineering
Comp 353 - Databases
Winter 2022

Assignment 1
Submission through Moodle is due by February 10th, 2022 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 sell them to the local people who are interested in them. Part of the donations is 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, and Sales.

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, and the selling price of the product.

Sales is the relation that holds the information about the items sold. Every sale has an ID, date of the sale, and amount of the sale.

Some information about how this organization runs:

- A donation type can be either money or products.
- If 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 removed from the products relation.

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)
4. Sales (sID, date, amount)

* Address consists of civic number.

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 Donors [3 points]

e) Provide SQL statements that delete all data that you populated in table Donors. [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 Donors that live in the city of Laval. Information includes donorID, first name, last name, date of birth, phone, email, gender, and SSN.

b) For every female Donor who lives in the city of Montréal, give the total amount of donations she donated in 2021. Result should be displayed in descending order of total amount.

c) Give a detail of all the donations that Nancy Robertson has donated. Details include donation date, type and amount.

d) Give a monthly report of sales for 2021. The report includes for every month in 2021, the total sales of the month.

e) Give a list of all products that have been donated for more than one year and are not sold. The list should include the product ID, the description, the date of the donation, and the sales amount of the product.

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 Laval.

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.