SQL Programming Project
Database Design

Description

This SQL programming project involves the creation of a database host application that interfaces with a backend SQL database implementing a Contact List application. This is an individual (not group) project. All work, design, and coding must be done individually by you.

Programming Language(s) and Frameworks

Your host application should have a GUI interface. You may implement either a native GUI application or a web GUI interface.

Your application GUI may be programmed with Java, Ruby, Python, Javascript, or PHP.

- You *may* use a web programming framework like Django (Python) or Node.js (Javascript).
- You *may* use an ORM (object-relational mapping) framework, like Hibernate, provided that your SQL schema is compatible with the requirements.
- You *may not* use a NoSQL database such as MongoDB, JSON, Cassandra, etc.
- Approved SQL databases are MySQL, PostgreSQL, MS SQL Server, and SQLite.

If you would like to use any other language or framework not specifically listed above, you *must* obtain prior approval from the TA that they are able to effectively evaluate the language of your submission.

Functional Requirements

1) Graphical User Interface (GUI) and Overall Design [25 points]

All interface with the database (queries, updates, deletes, etc.) must be done from a graphical user interface of your original design. Your GUI application will interface with the Contact List SQL database via an appropriate SQL connector. Initial database creation and population may be done from command line or other admin tool, like a Workbench. Overall design will be judged on usability first, look-and-feel secondary.

Required information to display in a Contact Display Window includes:

- First, Middle, and Last name
- Address List – must accommodate a *variable* number of addresses, each of which should contain the following:

  - Type of address (e.g. home, work, other, etc.)
  - Street Address
  - City
  - State
  - Zip code (i.e. postal code)
- Phone Number List - must accommodate a variable number of phone numbers, each of which should contain the following:

  - Type of number (e.g. home, work, fax, etc.)
  - Area Code (3-digits)
  - Number
- Date List – must accommodate a variable number of dates, each of which should contain the following:

  - Type of date (e.g. birthday, anniversary, etc.)
  - Calendar date
- An option to modify or delete an entry from the Contact Display Window.

2) Contact Search [25 points]

Using your GUI, be able to search for a contact, given any combination of Name components, Address component(s), Phone number components. All searches should be done via a *single* search field (like Google or Bing). The result of your query should display a list of all contacts that match the search. A search results should include a list of "hits" that displays

- Full name
- An option to modify or delete an entry from the search results.

3) Adding New Contacts [25 points]

Your GUI should provide a menu item or button that brings up a New Contact Entry form. The New Contact Entry form should allow for entry of all data, including the ability to add a new Addresss, new Phone number, or new Date to the respective lists.

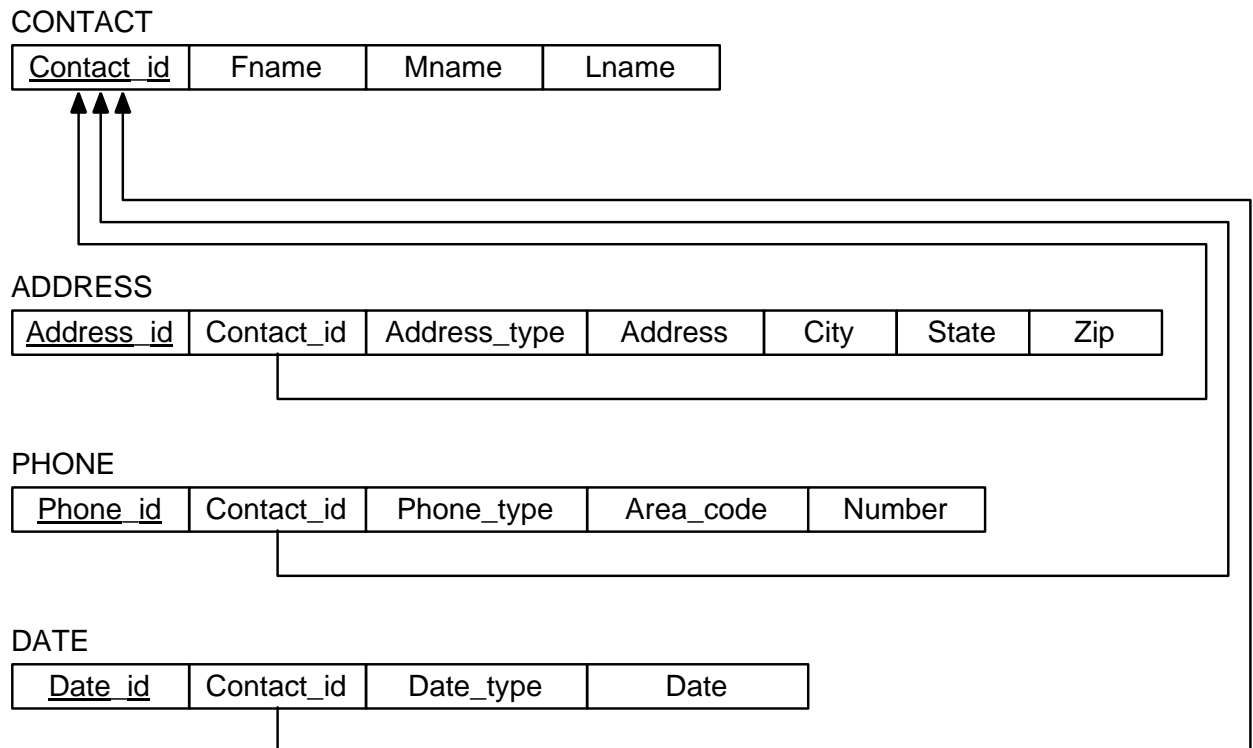**4) Modifying / Deleting Existing Contacts [25 points]**

Your GUI should provide a menu item or button that brings up a Modify Contact Entry form. The New Contact Entry form should allow for entry of all data, including the ability to add a new Address, new Phone number, or new Date to the respective lists.

Schema

The schema for the minimum required SQL schema requirements are pictured below. You are permitted to modify or augment this schema provided that your system (a) is backwards compatible with the given schema, and (b) adheres to the written requirements. As long as your system supports the documented functionality, you may add any features you deem useful.

Note that every record has a primary key that should be auto-generated. It is suggested that these keys be integers that are created with the SQL AUTOINCREMENT option.

CONTACT

Contact_id	Fname	Mname	Lname

ADDRESS

Address_id	Contact_id	Address_type	Address	City	State	Zip

PHONE

Phone_id	Contact_id	Phone_type	Area_code	Number

DATE

Date_id	Contact_id	Date_type	Date

Data

- Baseline data to initialize your database will be provided in the eLearning programming assignment folder.
- All data is provided in plain text CSV files. Note that there is *not* a one-to-one, file-totable correspondence. Part of your system design task to map (i.e. normalize) these data onto your schema and tables.