New York University Tandon School of Engineering
Project for Intro. To Databases (CS-UY 3083 - B)
Professor Salim Arfaoui

(15 points) Milestone 1: DB design

Due: 11:59pm, Sunday, Feb 25, 2024

Purpose:

- Develop a high-level design of your database, using Entity-Relationship (E-R) model
- Convert E-R model into tables
- Apply business logic and domain specific of your project to determine the cardinality of relationships and indicate any mandatory relationships
- Understand and apply the concepts of normalization to normalize tables, and thus improving the design of your database
- Evaluate your project milestone for compliance with the requirements
- Work as a team, collaborate with your project partners professionally and contribute fairly

Submission instructions

- You should submit this deliverable on Gradescope.
- For this deliverable you should turn in 2 separate files (as a team submission):
  - ***PART1.pdf*** **file that includes all the** `ERD and schema statements`
  - ***PART2.sql*** **file that includes all the** `CREATE TABLE` **statements**
- You are also required to submit the peer evaluation form (Individual submission)

Requirement specification:

Your company receives the following memo. First, based on the memo, create an initial database design **(E-R model)** for the City Jail that indicates entities, attributes (columns), primary keys, and relationships. In developing your design, consider the columns needed to build relationships between the entities. Use only the entities identified in the memo to develop the E-R model. Second, create a list of additional entities or attributes not identified in the memo that might be applicable to a crime-tracking database.

Keep in mind that the memo is written from an end-user perspective—not by a database developer!

MEMO To: Database Consultant
From: City Jail Information Director
Subject: Establishing a Crime-Tracking Database System

It was a pleasure meeting with you last week. I look forward to working with your company to create a much-needed crime-tracking system. As you requested, our project group has outlined the crime-tracking data needs we anticipate. Our goal is to simplify the process of tracking criminal activity and provide a more efficient mechanism for data analysis and reporting. Please review the data needs outlined below and contact me with any questions.

Criminals: name, address, phone number, violent offender status (yes/no), probation status (yes/no), and aliases

Crimes: classification (felony, misdemeanor, other), date charged, appeal status (closed, can appeal, in appeal), hearing date, appeal cutoff date (always 60 days after the hearing date), arresting officers (can be more than one officer), crime codes (such as burglary, forgery, assault; hundreds of codes exist), amount of fine, court fee, amount paid, payment due date, and charge status (pending, guilty, not guilty)

Sentencing: start date, end date, number of violations (such as not reporting to probation officer), and type of sentence (jail period, house arrest, probation)

Appeals: appeal filing date, appeal hearing date, status (pending, approved, and disapproved)

Note: Each crime case can be appealed up to three times. Police officers: name, precinct, badge number, phone contact, status (active/inactive)

Additional notes:
• A single crime can involve multiple crime charges, such as burglary and assault.
• Criminals can be assigned multiple sentences. For example, a criminal might be required to serve a jail sentence followed by a period of probation.

(10Pts) — Part1: Entity relationship Diagram (ERD)
In this deliverable, you will work **as a team** to develop a high-level conceptual depiction of your database. You will transform the given requirement specification into an **E-R Diagram**, resulting in entity sets and relationship sets. Indicate cardinality on all relationships; identify any mandatory relationships; specify any simple attributes, composite attributes, multi-valued attributes, and weak entities.

You are required to model everything in your database. Do not leave out stuff. Be sure to include any assumptions you may have made and make sure to justify your design decision.

You are required to create a digital illustration of your E-R diagrams. You may use any software to draw your diagrams. — No hand-drawing on paper. No digital hand-drawing. No hand-drawing through any software. There are several easy-to-use web-based software (some are free, some offer a free trial) that you can use to draw an E-R diagram:

- **Draw.io (Recommended)**
- Excalidraw
- Lucidchart
- yEd
- Dia
- Visual Paradiagm

After you have finalized the ERD, convert it to a **Relational Data Model** (Schema statements).

What to submit:

PART1.pdf:

- (*5pts*) E-R-Diagram with all the necessary details
- (5pts) Relational Schema Statements

(5Pts) — Part 2: Convert E-R diagram into tables (SQL CREATE TABLE statements)

Once you have finalized your E-R diagram, convert the diagram into tables. Represent the tables using CREATE TABLE statements.

You are required to have **10 different tables** — not 10 entity sets, thus tables for relationship sets (associative entities) and tables for multi-valued attributes count as well.

If converting the E-R diagram into tables does not meet the minimal requirements (10 different tables), you should revise your E-R diagram to ensure that you have covered every aspect of your project.

What to submit:

PART2.sql

- (*5pts*) SQL CREATE statements representing the details from your E-R

Part 3: Peer evaluation (due when this milestone is due)

- This is an individual task.
- The teaching team will consider this peer evaluation (along with the other peer evaluations and other deliverables) when assigning the project final grade to an individual team member. Each team member's grade may be adjusted by 0%-100% deduction, based on his/her contribution.
- Submit your peer evaluation: https://docs.google.com/forms/d/e/1FAIpQLSfYSxIUOWoWsGDKaeEqZ1DlcIrZF0ED0jPYyRzJf7WSnmc1cQ/viewform?usp=sf_link
    - **Everyone is required to submit the peer evaluation**
- You are required to enter the names and NetIDs of all team members
- Once this form is closed, the form will not be reopened and we have to assign a zero grade to this section of the rubric.

What to submit:

Peer evaluation form