COSC 3337: DATABASE THEORY
Homework 3: due on Fri. 3/27/2020 at 11:59 pm

Remaining late days may be used in this assignment if needed.
Check "Late Days" policy in syllabus for more details.

Design an ER diagram and the relational schema for the Bank database that should satisfy the following requirements:

- Each bank has a unique ID, name, and headquarter address. Each bank has many branches, and for each branch we need to keep the branch ID (unique within the bank but not unique across different banks), location, and telephone number.
- Customers can have many accounts at the same branch or at different branches. An account has a unique account ID, type (E.g., saving, or checking), currency (E.g., dollar, euro), and balance.
- A customer can take many loans from different branches, however there are a restriction that a customer cannot take more than one loan from a given branch in the same year. For each loan we need to keep the loan amount and the year.
- Each customer has a SSN (unique ID), name, address, and DoB properties.

We need to capture the transactions done by each customer over each account. We capture the type of the transaction (e.g. either withdrawal or deposit), the transaction time, and the amount.

For this ER diagram, make sure to include the cardinality constraints with optionality.

Submission Instructions:

1- Your solutions should be submitted through Canvas. Email or paper submissions will not be accepted.
2- Remember that no handwritten/drawn diagrams will be accepted. Please use drawing tools such as lucidchart.com (student free version), draw.io, or any drawing tool of your choice. Also make sure your submissions are in the pdf format.
3- For every E-R diagram, make sure to list any assumptions you consider and the cardinality symbols you will use.
4- Include in your submission a video recording (5 min. max) explaining your solution. See video recording instructions below for specific details.
5- Make sure your ER diagram submission filename is of the format "HW03-*FirstLastName.*pdf", and your video filename is of the format "HW03-*FirstLastName.*mp4" or "HW03- *FirstLastName.*mov".

Grading: (Total points: 10 pts.)

- (8 pts.): ER diagram satisfies requirements and is correct.
- (2 pts.): Video recording explaining your solution follows the video recording instructions.
- (- 1 pt.): For each missing entity or relationship.
- (- 0.5 pts.): For each incorrect cardinality constraint with optionality.
- (- 0.5 pts.): For missing assumptions or cardinality key symbols used.

Video Recording Instructions:

The purpose of video recording your solution is to explain to your attempt towards solving the problem presented in this assignment. Make sure the length of your video does not exceed 5 minutes, and includes the following:

1. Introduction: Name, course, semester, homework #
2. Explain the question and how you plan to solve it
3. Walk through the solution, very important to explain every step rather than just reading the solution. Explain why you chose those the different components of your solution, e.g. entities, attributes, relationships, etc.
4. List any assumptions that you may have made
5. List the cardinality key symbols used
6. Overall picture and conclusion, and a simple thank you for watching.

Final note, please be professional in the recording to a certain extent, be brief in explaining your solution and any necessary details to show your comprehension to the course material and your solution. All things recorded (picture and audio) in the video must be academically appropriate.

Submission Checklist:

Use this checklist to make sure your submission contains the following:

☐ ER Diagram submitted as .pdf document
☐ Movie file submitted as .mov or .mp4 file and follows video recording instructions
☐ ER diagram lists all assumptions and cardinality key symbols used
☐ Submission files follow the format described in the submission instructions
☐ Submission files downloaded and checked for missing files
☐ Submission files tested on a different computer (e.g. ACL lab machines)

Always let me know if you have any questions or need more clarification on the assignment or submission instructions.

Good Luck ☺