Cairo University
Faculty of Computers and Artificial Intelligence
Information Systems Department
Database Systems -1

Database Systems-1 Project

Project Instructions:

1. Your team has been assigned a specific database project to work on. Kindly refer to the "Assigned_Projects.pdf" file to check the project allocated to your team.
2. You are required to implement the proposed functionalities in the assigned project or propose your own.
3. All team members must participate and contribute to the project.
4. The final project deliverables will be uploaded on the classroom and discussed with the TA.
5. Due Date: **May 21, 2023**

1. Project Deliverables

The system entity relationship diagram **Note:** We suggest that you review the system's entity relationship diagram with your TA during the upcoming week, starting on May 14th, to ensure that your team is working efficiently.
• Students are required to construct the system's ERD (conceptual model) • ERD should include at least 5 entities including at least 1 many-to-many relationship. Including Weak Entity (1 bonus) • Primary keys, foreign keys, and relationships should be clearly defined in the ERD.
Software Application + Conceptual ERD + Corresponding Physical ERD + Implemented database on MS SQL Server

The deadline for submission is on **May 21, 2023.**

- Convert the conceptual ERD into a physical ERD.
- Submit both conceptual and physical ERD.
- Deliver the SQL Server database generated from the physical ERD with populated data.
- Implement an application program using C# (or other permitted languages) that includes at least:
  - 2 insert statements on 2 different tables.
  - 2 delete statements on 2 different tables (with conditions).
  - 2 update statements on 2 different tables (with condition).
  - Select data from any table(s) of the database.
  - Select data that involves more than one table of the database (using joins).
  - Generate 1 meaningful report (bonus).
  - Implement GUI (bonus).

2. Proposed systems

1- University Library Management (Ex. http://www-sul.stanford.edu).

- Proposed functionalities:
  - Signing up a new user (e.g. admin, student)
  - Updating a user's details.
  - Adding a book (by admin)
  - Updating a book details (by admin)
  - Browsing books ((by admin and students)
  - Showing a list of books that satisfy certain criteria (e.g., ISBN, Publication year, author…)

2- Flight reservation system (Ex. http://www.egyptair.com)

- Proposed functionalities:

- Signing up a new user (e.g. admin, customer)
- Updating a user's details.
- Adding an aircraft (by admin)
- Updating an aircraft details (by admin)
- Adding a flight (by admin)
- Updating a flight details (by admin)
- Showing a list of available flights that satisfy certain criteria (e.g. date, source, destination, required number of seats…)
- Performing operations on flights: booking, cancelling, changing flight class.)

3- Train booking (Ex. http://www.amtrak.com)

- Proposed functionalities:
  - Signing up a new user (e.g. admin, customer)
  - Updating a user's details.
  - Adding a train (by admin)
  - Updating a train details (by admin)
  - Adding a trip (by admin)
  - Updating a trip details (by admin)
  - Showing a list of available seats that satisfy certain criteria (e.g. date, time, source, destination, required number of seats…)
  - Performing operations on trips: Booking, and canceling.

4- Bank System

- There are multiple banks and each bank has many branches. Each bank has a name, code and address. Each branch has an address and a branch number.
- Each branch has multiple customers. Each customer has an SSN, name, phone, and address.
- Some customers may take different types of loans from these bank branches.

Each branch offers multiple loans. Loan number, loan type, and loan amount must be kept for each loan.

- One customer can have multiple accounts. For each account; account number, balance and type must be kept for it.
- Proposed functionalities:
    - Signing up a new user (e.g. customer, employee)
    - Updating a user details
    - Add bank (by admin)
    - Add bank branch (by Admin)
    - Add a customer (by employee)
    - Showing a list of loan (e.g. industry loan, commercial loan, Personal loan ...)
    - Showing a list of customers
    - Showing a list of loans with customer name and employee name
    - Performing operations on loans: request and start operation (by customer)
    - Performing operations on loans: accept (reject, pay loan (by employee)