CSE 370 – Database Systems

Assignment 01

Fall 2023

Marks
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Full Name (in Block Letter): _____ ID: _____ Section: _____

Question 1 : [10 points]

A startup has hired you to help design and set up a database system for a Bangladeshi airline company**.** **Construct** an ER diagram based on the following data requirements:

- There are several passengers in the airline. Passengers have a unique passport number, unique NID, Name, a phone number, and multiple email addresses which can be stored in the database.
- Flights are offered by the airline. Flights are characterized by their unique flight id, a departure airport, a destination airport and a departure timestamp (which is composed of date and time),
- An airline also owns multiple aircrafts. An aircraft is attributed by a unique license number, model number, manufacturer and maximum passenger capacity.
- Many employees work for the airline company. An employee has a unique employee id, name, address, flying hours and designation.
- A flight must use exactly one aircraft. One aircraft may be used for several flights.
- Several employees work on the flight. Moreover, the timestamp is recorded when employees start and end their shifts for a particular flight. The same employee can be assigned to different flights at different times.
- A flight must have at least one seat. A seat has attributes such as a seat number, type and a base fare. Note that different seats in different flights can have the same seat numbers, but in the same flight the numbers will not be the same (such as 1, 2, 3 and so on).
- Passengers can book any number of seats. After booking a seat any discount amount and the payable fare is required. The payable fare of the seat can be calculated from the base fare and discount amount, so it does not need to be stored in the database. However, it is an important attribute and should be shown in the diagram using an appropriate symbol.
- Passengers have the ability to refer other passengers to the airline company. When one passenger successfully refers to another passenger, both the referrer and the referred passenger earn points, which are recorded and stored in the database.

Do not assume any attributes/entities/relationships/multivalued/composite other than the ones mentioned above. For participation constraints/cardinality ratios, if they are not hinted at in the question, you may assume according to your logical reasoning.

Question 2 : **[10 points]**

Design an EER diagram for a Cricket World Cup management system. The database should contain information about different cricket tournaments, teams, players, matches, match statistics, umpires, and any other important aspects of cricket tournaments.

In your EER diagram, you have the freedom to design entities, attributes, and relationships as you see fit, while adhering to the following constraints:

- There should be at least one disjoint-partial specialization/generalization.
- There should be at least four regular/strong entities (excluding subclasses).
- There must be at least one recursive relationship.
- There must be at least one M:N relationship.
- There must be at least one 1:N relationship.
- There must be at least one weak entity.

Show all important attributes, entities, and relationships in order to represent a clear and complete scenario. The EER diagram should be logically accurate and realistic, representing the database of the given scenario.