Due Dates:
Final Report: Due at demonstration time

In this project you will design and implement a database application. You will work in groups of three students. The project is carried out in two main steps:

1. Conceptual design using the E-R model. Translation of the E-R model into the relational model. Refinement of the design (into at least 3NF schemes, preferably BCNF or 4NF schemas).

   Your preliminary report should cover this step of the project.

2. Implementation: Creation of database tables, data entry, design and implementation of queries, transactions, and (web-based) interface.

   Your final report should contain (1) The final ER design, (2) The final relational design, including listing of all tables (schemas), keys, and data dependencies, (3) Data (current at demo time), (4) Queries and application programs. (5) You should also indicate, for each member of the group, which parts/tasks were implemented by that member.

Each team will demonstrate their project online. All members of the team should be present at the time of demonstration.

THE PROBLEM:

You are to design and implement a simple database system for an airline reservation system. These are some of the queries and transactions your system should provide:

1. Customer Queries and Transactions:

   (a) List flights from city A to city B (and return) on a given departure date D and return date D’ that have n seats available (customer enters A, B, D, D’ and n). System should check that D’ is later than D. Direct flights are preferred. In addition, we also allow flights with one connection. Connection time should be at least 50 minutes. Customer should be able to select a flight (and return) from the given list.
(b) Optionally, for one-way flights, list flights from A to B on departure date D that have \( n \) seats available. Same restrictions (direct, or one-stop flights with at least 50 minutes connection time) applies. Customer should be able to select a flight from the given list.

(c) In both cases above, system will list the selected flights and the price (for one seat as well as the total). Customer can make the reservation or go back to flight listing.

(d) To complete the reservation, system obtains payment information (credit card type, number, expiration date) from customer.

2. Administration Queries and Transactions:

(a) Add flights + flight information (such as capacity, price, ...).

(b) Remove flights (system should check that no seats has been sold yet).

3. Extra credit.

(a) Flight price can be the sum of the prices for the segments (no extra credit). Or, for extra credit, it can depend on the cities (eg, cities A and B) and/or days of flight (weekend flights are more expensive).

(b) Seat assignment: Seats can be window, aisle, or middle seats. Seats are assigned at customer’s request at reservation time.

(c) Statistical reports: Generate reports to help the airline administration with their decision making. For example, given a flight number and a period of time (start date/end date) print a report that lists days of the week, and the average percentage of seats sold for each day of the week on that flight.

Each group will demonstrate their system. All members of the group shall be present for the demonstration.