

CS 348
Introduction to Database Management
Assignment 1

Due: 8 October 2012 9:00AM
Returned: 18 October 2012
Appeal deadline: One week after return
Lead TA: Khaled Ammar

In this assignment, you will be designing the conceptual model of a database for **Amazing Adventures** (AA) travel agency. A requirements analysis that was conducted has identified a number of things about the operations and goals of AA. You have been hired to set-up an information system to assist Amazing Adventures achieve its goals. As the systems analyst/designer, you should feel free to add to these requirements in order to achieve a richer design. Your task is to develop an Entity-Relationship model for the AA database that is specified as an E-R diagram.

Amazing Adventures is a new travel agency that is being set up with the objective of providing the best services to its customers by keeping at the leading edge of technology. Thus, they would not only like to provide the traditional travel agency services, but they also keep detailed records on their customers and their preferences in order to customize their services to the clients' needs and preferences.

The travel agency keeps records about a number of items. First and foremost, it keeps track of the airports in the system that are uniquely identified by their international codes (for example, for Pearson International Airport the code is YYZ). The name of the airport, its location (city and country) and its phone number are other essential information. The travel agency is thinking about including other information such as the available facilities so that this information may be provided to customers who may be connecting at a particular airport. There is information about the airlines (also called carriers in the business) that are also kept by the travel agency. The more important information about the airlines that are stored are their unique names, their addresses, the contact phone number.

One of the more important pieces of information that needs to be maintained is that related to flights. There is a need to know the carrier, the flight number, the departure and arrival (destination) airports, the departure and arrival times and the schedule (weekdays) for a given flight. One complication that is noticed during requirements analysis is that different types of airplanes may be assigned to the same flight on different weekdays. Thus, the number of available seats for each flight (both at the business and the economy class) change. Furthermore, the fare seems to change for different days (weekends are cheaper than weekdays) Therefore, there may be a need to keep track of these flight "instances" in addition to the more generic flight information. An airplane may be assigned to several flight instances (of course as long as their times do not conflict, but we are not concerned with this scheduling problem; that is the responsibility of the airlines). A flight instance, on the other hand, uses only one airplane. Needless to say, each flight has only one departure and arrival airport but each airport has many incoming and outgoing flights.

Since different airplanes may be assigned to a given flight on different days, customers have a tendency to ask what type of plane flies at a particular day. So, the travel agency also keeps airplane information. The typical information that is maintained are the airplane identity (BOEING, AIRBUS, etc.), type, what type of an airplane it is (e.g., jet vs turboprop), the (business and economy class) capacity of the plane (I know, I know – each plane can be configured differently according to the desires of each airline, but we will ignore that complication here), and other physical information such as maximum range, length, etc. that some strange customers may ask for.

An essential piece of the data that AA wants to maintain are data about its customers. This passenger information includes the name, address, telephone number, the set of frequent flyer memberships that the customer has (if any), the preferred payment method (e.g., credit cards and their numbers) and a list of preferences (front/back of the airplane, aisle/window, diet requirements).

When a customer makes a reservation, this should, of course, be kept in the company's database. The reservation record should identify the customer, the travel agent who made the reservation, the flights that are part of the same reservation (e.g., a flight from Edmonton to Vancouver and a flight from Vancouver to San Francisco), the payment mode for this reservation and the status of the reservation. Typically, a reservation is either OK'ed which means it is confirmed and a seat is reserved for the customer, or the reservation is on a waiting list. Note that it is possible for one flight leg on a

reservation to be OK'ed and another flight leg to be on the waiting list. For each reservation, the customer's preferences, his/her frequent flyer number (if any) are also recorded since the airline companies work directly from this relation and ticketing information and have no access to the customer information