

Flight Booking System - SYSTEM Requirements

A Flight Booking System (FBS) that serves different functionalities for reservation agents and reservation managers shall be designed and developed. The system shall be a simple, stand-alone application. "Stand-alone" means that it shall not be developed as a web-based on-line application, but a one which runs as an application on a single computer.

1. The following functionalities should be provided for reservation managers:
 - a. A starting page for reservation managers to log in with their username and password.
 - b. A reservation manager should be able to use this system to create accounts for reservation agents.
 - c. The reservation manager should be able to manipulate flights (enter new ones, update existing flight information, delete flights, etc.), and generate inventory reports of flights. The inventory report should contain a summary of all flights in the system that still have unsold seats (either economy or economy), and the total number of unsold seats of business class and economy class in all flights.
 - d. Flight information (to be manipulated by reservation managers) should include the following: airline code (e.g., AC), flight number (e.g., 321), departure airport, departure terminal number, departure date and time, arrival airport, arrival terminal number, arrival date and time, cost of business class and cost of economy class ticket.
 - e. The flight number is a 3-digit number, prefixed with 0's if less the actual number is less than 100.
 - f. The airline code must be a two-letter code defined in http://en.wikipedia.org/wiki/IATA_airline_designator.
 - g. The airport location must be one of airport with a three-letter code defined in http://en.wikipedia.org/wiki/List_of_airports_by_IATA_code.
 - h. When a flight is canceled by a reservation manager, all itineraries that are reserved or booked and include that flight should be canceled as well.
 - i. A reservation manager should be able to log out at any stage during his/her session.
 - j. Note that, for simplicity, users of type "reservation manager" can be created in the system's installation script which will be executed by a system administrator.
 - k. A user shall be able to buy ticket.

2. The following functionalities should be provided for a reservation agent:
- a. A starting page for reservation agents to log in with his/her username and password.
 - b. Once a traveler is logged in, he/she will be shown with a list of travel itineraries along with the status of each itinerary (reserved, booked, confirmed, or canceled). A travel itinerary is a travel arrangement with one or more flights, e.g., an example travel itinerary might consist of the following three flights: Calgary-Vancouver, Vancouver-Los Angeles and Los Angeles-New York. An itinerary has the status “reserved” when it is created (saved) by a traveler, “booked” when it is paid, “confirmed” once it is confirmed by the airline (via a reservation manager), and “canceled” when it is marked cancel by a traveler from his/her itinerary list, or when one of the flights in the itinerary becomes canceled by the reservation manager, or payment not received after 5 minutes (simulating the conventional 24 hours holding period in the real world). The cancellation of an itinerary cannot be rolled back.
 - c. An agent should be able to register him/herself with the reservation site, enter personal profile information including: name, address, username and password, email address, as well as credit card information (optional to save), including credit card type, a 16-digit card number and a 4-digit expiration date.
 - d. A traveler should be able to create and book a travel itinerary by going through the following steps:
 - Search for flight information by providing departure/arrival date/time and location, number of passengers, and one-way or round-trip option.
 - A list of available flight options will be shown to the on-line traveler, with departure/arrival and cost information. The departure time will be plus or minus the specified number of hours within the specified departure time. It is possible that one itinerary contains one or more flights from one or more different airlines.
 - Once the traveler selected an itinerary from the list, he or she has the option to reserve it. Of course, before the traveler can reserve a selected itinerary, he or she must be logged in.
 - Once the traveler reserved an itinerary, he or she has the option to book it by providing payment information via credit card. If the credit card information is not on-file for the traveler, he or she will be prompted to enter the credit card information (card holder’s name, type, number and expiration date).
 - The credit card information has to be validated first before booking. For simplification, follow the following simple credit card validation mechanism. A valid combination of credit card number and expiration date is defined as the number “four (4)” being a denominator of the 16-digit card number, and the 4-digit expiration date is defined with a valid YY/MM format, respectively.

- Once the credit card is validated, the traveler will be shown with the actual ticket information. The ticket number is automatically generated by the application in the format of XX-FFF-YYYYYY-ZZZ, where XX is the airline code, FFF is the 3-digit flight number, YYYYYY is the traveler's login name (of an arbitrary length), and ZZZ is a 3-digit sequence number generated by the application. The sequence number should be unique for each traveler in each flight.
 - If the credit card number is invalid, a web page with an error message will be displayed to the user and the user will be asked to re-enter the credit card information or cancel the booking process.
 - If a "reserved" itinerary is not paid for by 5 minutes (simulating the conventional 24 hours holding period in the real world) from the time of reservation, it cannot be booked anymore, and its status should be changed to "canceled" by the system. As a simple implementation, you might want to change the status to "canceled" the next time an un-paid itinerary is accessed by a traveler (after 5 minutes simulating the conventional 24 hours holding period in the real world).
- e. Cancellation after payment is not permitted.
- f. The traveler should be able to log out at any stage during his/her session. If the traveler is logged out during the preparation of an itinerary, the next time when the traveler is logged in again, he or she should be able to continue with the previous itinerary-preparation process.