

CIS 611 Final Term Project

Spring 2017 - 100 Points

Submission Due date: Monday, May 1 2017, by 11:59pm

Networking Client-Server & Database Application

Task Specifications:

Airline ticket reservation system is one of the essential applications of E-commerce. With the development of network technology, many people consume online reservation systems, which are more convenient than traditional ticket reservations by phone or personal visits to an airline office. The goal of this project is to make people purchase airline tickets using Kiosk machines. You will build a simple airline ticket booking system for an airline company using Java.

An airline company wants you to develop a Java-based airline ticket reservation system. The main goal of the application is to reduce the work volume on the cashiers in the airline offices, such as in airports, allows cashiers serve fewer customers while taking phone orders, and gather contact information of the customers in order to spread out flight deals.

This airline ticket booking system is developed for a particular airline. Customers of the application can make ticket reservation through *Kiosks* (Terminal computer machines in the airline offices). Customers, through the reservation system, can view flights for certain dates, and book a flight from and to certain airports, if and only if, there are some available seats in the flight. The flight details, for a certain date, has the following information: the departure airport, arrival airport, departure time, arrival time, price, and the current ranking number of the airline (1, 2, 3, 4, or 5 stars *).

A customer can make multiple reservations, and the customer earns 500 points with each ticket reservation. Extra points, for a ticket reservation, a customer can get 10% discount if a customer has earned more than 2000 points with this airline ticket booking system.

Every flight has a different number of total seats. Therefore, if all flight seats are reserved, then a customer cannot buy an airline ticket. For this project implementation, the reservation for certain seat numbers in the flight is disregarded.

A new customer is required to sign up for an account before reserving an airline ticket. The customer account requires a customer to create a user name and a password. An account personal information is required also to spread out ticket fares, such as full name (first and last), mail address, emails, phone number, total earned points, etc. Returning customers are only required to login in order to buy tickets or view purchased tickets.

Once the customer has completed the ticket reservation, the application must handle the reservation payments. Payment information includes payment amount and credit card information. A user is required to enter the credit card information, and this information is validated before the order is completed. For simplicity, if the payment information is valid (the credit card number is 16 digits), then the payment is considered successfully processed and the ticket booking is confirmed. After the booking is confirmed, a customer can print an airline ticket (display the ticket in the GUI window). An airline ticket must have the ticket number, customer full name, airline name, departure date, departure time, arrival time, price, etc.

The customers can cancel the ticket reservation, with the business rule, 1 day before the actual flight date. Canceling the ticket reservation means that the reservation must be deleted from the airline ticket booking system database. If the reservation is deleted, then all the associated payment information must be deleted too.

For this implementation, the application administrator or a database administrator (DBA or a system admin) is responsible to manipulate flight information. For example, a DBA must be able to insert, delete, and update the flight information, such as the flight date, departure time, arrival time, departure airport, arrival airport, total number of seats, price, etc. See below the tentative Entity Relationship Diagram (ERD) for the airline ticket booking database tables.

This Java-based airline ticket reservation application adheres to the 3-tier client-server Architecture, where we have multiple clients interacting with a centralized application server that is connected to a database server. Having this software model implemented, the centralized application server handles reservation requests coming from clients, such as Kiosk computers in the travel agent office, and it communicates with the centralized database in order to perform the ticket reservation. Therefore, the client is a thin program responsible to interact with application users and forwards requests to the server program, then the client waits for responses from the server. On the other side of this architecture model, the server is a thick program that interacts with the MySQL database server in order to provide services to the airline ticket booking system clients.

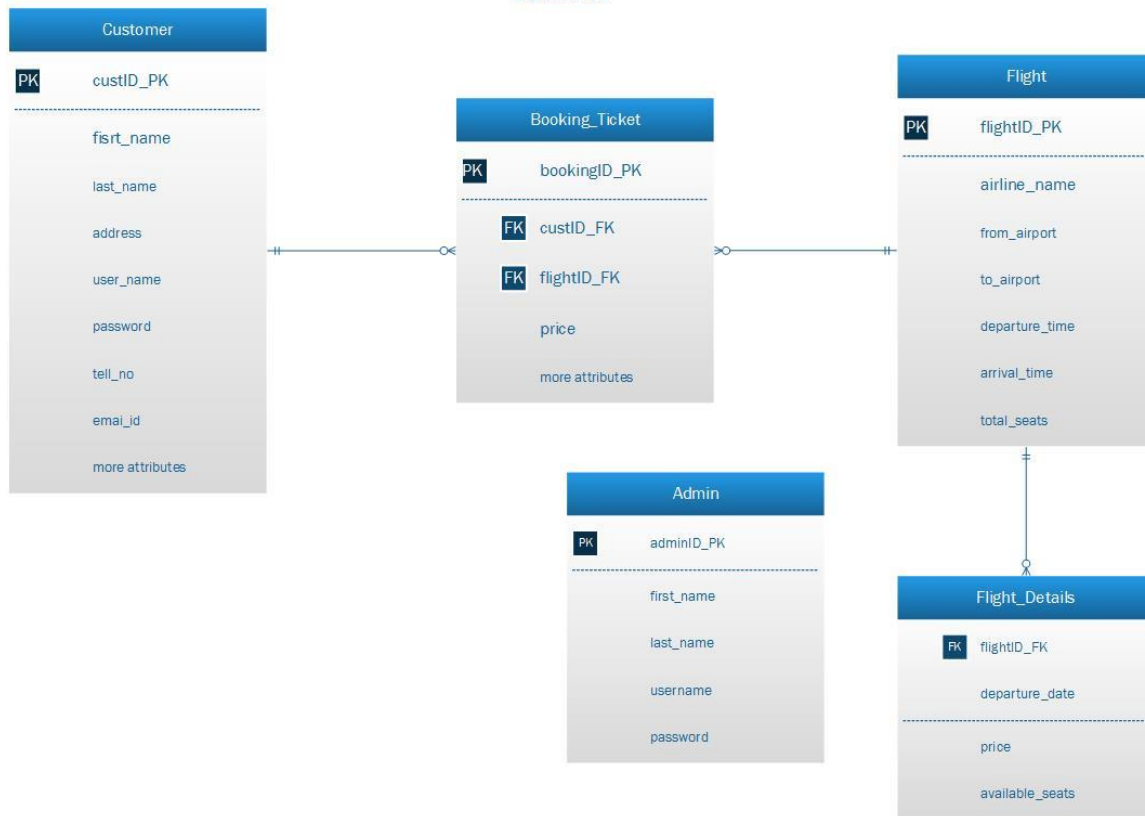
The implementation of this project must have graphical user interface GUIs built using the Java Swing packages. Principally, the GUI interface is for users to interact with the airline ticket booking system. This program must have two client GUI interfaces, one for the customers and one for the DBAs. The customer GUI window allows customers, for example, to make ticket reservations or view current reservations. The DBA GUI window must also be provided in order for DBAs to define or update flight information. Use your own creativity in the design of these GUI interfaces. For example, in the main login GUI, a user can choose the role of a customer or DBA in order to login to the application. Once a user has logged into the application, a related user GUI window must pop up based on the user role (customer or DBA window).

Task Instructions:

- You may use the client/server database project example in week 12 code examples
- It is required for this project to create GUIs, use your own creativity to create the Client/Server GUIs, use some code from the examples and projects
- You need to download the open source MySQL Workbench or WAMP (<https://dev.mysql.com/downloads/workbench/>) and WAMP Server (<http://www.wampserver.com/en/download-wampserver-32bits/>) in order to create a local database in your personal machine
- Use the following link to learn how to create a MySQL database and tables in within WAMP phpMyAdmin: <https://www.free-ebooks.net/ebook/Design-Your-Own-Website-With-WordPress/pdf?dl&preview>
- Use the following tutorial link for creating a new MySQL Connection in Workbench : <https://dev.mysql.com/doc/workbench/en/wb-mysql-connections-new.html> (Link to an external website.)
- Use the following tutorial link to create a new scheme model (your project database and tables) in Workbench: <https://dev.mysql.com/doc/workbench/en/wb-getting-started-tutorial-creating-a-model.html> (Link to an external website.)
- Spend some time to review the project submission and code review document in Canvas; the final project is a single attempt

Database Entity Relationship Diagram (ERD):

An ERD model for the Airline Ticket Reservation System Database



Evaluation Criterion:

- All tasks must be completed to receive a complete credit for this project
- The application must perform all the requirements correctly, including read user inputs from GUI, store data in a database, updating the user GUI information
- The application must handle improper input format, size of inputs, required inputs, etc.
- Users of the application must interact with a friendly graphical user interface, GUIs must be informative, simple, and easy to use
- The program must view a correct information from the application database to the users
- Users must be capable to create new accounts and perform log in operations
- The application must not crash from improper inputs, from accessing database to retrieve, delete or update data, or any other forms of users' interactions
- The application database must be created correctly, see the ERD diagram
- The client must be implemented to receive information from users, request services from the server program, and display the responses from the server in a user friendly format
- The client side must only perform the interface operations including the data validation before passing the data to the server program

- The client program must not have any business logic implementation such as code to execute queries on the database server, all the business logic code must be implemented in the server side

Submissions & Review:

Please review the class syllabus in Canvas for due dates and review policies

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Final Project– Grade Sheet

Group Name(s): _____

Evaluation Criteria	Comments	Max	Points
Use of the class template in the project classes		5	
Customers can browse the flights for a certain date		5	
A new customer can sign up for an account (creation of a new customer account); a customer is required to create a user name and password		5	
Authentication, a customer must login before making a ticket reservation. A returning customer (for which account is already created) can log in without requiring to create account information again		5	
Authentication, a system admin must login in order to manipulate flight information		5	
A customer can make multiple ticket reservations		5	
Use of appropriate validation checks (e.g., required fields, correct data types, range checks) to ensure an error-free user experience, such as credit card number		5	

A customer can display a ticket information, in a GUI text area, such as the reservation number, customer full name, etc.		5	
Customers must be able to view all the reserved tickets for a particular date		10	
A customer can cancel a ticket reservation under the business rule, 1 day before the actual flight date		10	
A DBA user must have access to manipulate the ticket information		10	
The application program implements a 3-tier client-server model, where a client requests services from a server, and a server communicates with a database server in order to provide the services		10	
A client program only interacts with users and communicate with a server program, it does not communicate with the database server directly		10	
A database is created in a database server to store the kiosk system data, and data must be manipulated based on the SQL queries sent from the server program		10	
A customer can get 10% discount if a customer has earned more than 2000 points		10	
Total		110	