

ITP4915M Software Development Project – Project Scenario

Requirement and Design Specification	Submission Date
Requirement Specification (CA)	1-Mar-2016 (12:30pm)
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System Overview

In this project, you are appointed as a software engineer to take over the new IT software development project in designing an integrated tourism management system that meets the needs of both travelers and travel agencies (Ticket Tailor Ltd.). You have to work with the project manager in the software company you are working for. The Project manager is responsible for planning and monitoring your development process. You are in charge of designing the user interaction, strategies of the core design, along with implementing the gallery section and major sections that required interaction with different forms.

The project initiated in Information Technology Department and requested by a new customer called “Ticket Tailor Ltd.” The objective of this management system project is to develop a system that automates the processes and activities of a travel and tourism information. (該管理系統項目的目標是開發一種自動化的旅行和旅遊信息的過程和活動的系統) The purpose is to design a system using which one can perform all operations related to traveling. In the present system a customer has to approach various agencies to find details of places and to book tickets. This often requires a lot of time and effort. A customer may not get the desired information from these offices and often the customer may be misguided. It is tedious for a customer to plan a particular journey and have it executed properly.

The proposed system is a Visual Studio Application and maintains a centralized repository of all related information. The system allows one to easily access the relevant information and make necessary travel arrangements. Users can select the places what the customer want to visit and make bookings for travel and accommodation for its customers. (該系統允許人們輕易地訪問相關信息，預訂旅行和住宿為客戶什麼地方)

Requirements Analysis and Project Planning (需求分析和項目規劃)

In the development phase, you discovered system requirements by **fact finding** methods from users and stakeholders (用戶和利益相關者), brainstorming, and use-case modeling. After the requirement analysis you are required to design the software with the incomplete **Unified Modeling Language (UML) diagrams** such as **Use-Case diagram**, **Entity Relationship Diagram**, **Class Diagram** and etc.

In physical design, you will use **C# in Visual Studio 2015 Express Edition** to develop the system, as it is a strong user form design ability that provides various form control and data source facilities for window-based development and supports database connection that makes the design clean and maintainable. Finally, **choosing Visual Studio 2012** had the **lowest technical risk**, as you are the Visual Studio developer and most of the company projects were developed by it.

Final Product

The final product is a Visual Studio **system in English** that provides a place for **individual travelers** (個人遊客) to get information of air **tickets**, **hotels**, **attractions** (景點), **cruises** (遊艇), and other related information for their desired trips. It is the best place to offer the great deals and related services to all individual travelers.

Scenario from the operations of Ticket Tailor Ltd

Ticket Tailor Ltd. is travel agency company locates in Hong Kong with more than 30 customer service centers in the region, the company provides **individual travel packages** with the details of travel places, to make the **hotel reservations** (酒店預訂) and to **arrange attraction activities** (安排吸引力的活動). This form of travel agency services is now quickly becoming a lucrative and highly competitive business. Their services penetrate in Hong Kong, Macau and Southern area of China, and they have customers across different scale of tour groups and individual travelers. Ticket Tailor is an innovative service provider determined to be successful through the use of information

and communications technology and they want a system that supports the following functions:

ID	Name	Description
1.1	Flight Schedule and Hotel Schedule Table	You are required to create these two tables from the the given information for the further application development in the “Ticket Tailor” project.

Ticket Tailor already has some sample data stored in xlsx files so disorganized. Your goal is to import the data to create a unified and efficient database. You have to:

- Create tables / import data files available in this folder session.
- Name the database called “tickettailor_db”.
- Name the table called according to the tab name which is stored in the EXCEL files (Flight_Info.xlsx and Hotel_Info.xlsx).
- Build the right relationship between the tables if it is necessary.
- Apply to all fields of ticket fare is numeric with no decimal place.
- FlightID is for the FlightSchedule table, it is a primary key of the table.
- HotelID is for the Hotel table, it is a primary key of the table.
- All ticket fares including Flight Schedule and Hotel, must be stored in a number format with no decimal place.
- The photos of carriers are available in the session folder.

estimatedDateOfDeparture (EDD)

estimatedDateOfArrival (EDA)

estimatedTimeOfDeparture (ETD)

estimatedTimeOfArrival (ETA)

ID	Name	Description
1.2	Login Module	A login user interface in C# application for further application development. The development involves the Login form with Staff table. It is used for helping the staff of Ticket Tailor to login to various modules for access control and management.
1.3	Module Form	A user form that have FOUR menu selections to link with four different modules. After logged in, this form will be displayed with their login name and the user photo.

According to the staff login form (Figure 1.2a), design a “Staff” table in the database “tickettailor_db” in MySQL/MSSQL database which is installed in your working computer. The system will use the information in the “Staff” table to develop other modules in the Ticket Tailor system. Now, you are required to develop Login Form User Interface and create the table called “Staff” to support the application of Ticket Tailor. Staff details will be given in an Excel file in this session folder.

With the basic information given above, you have to follow the detail instructions below to complete the login module:

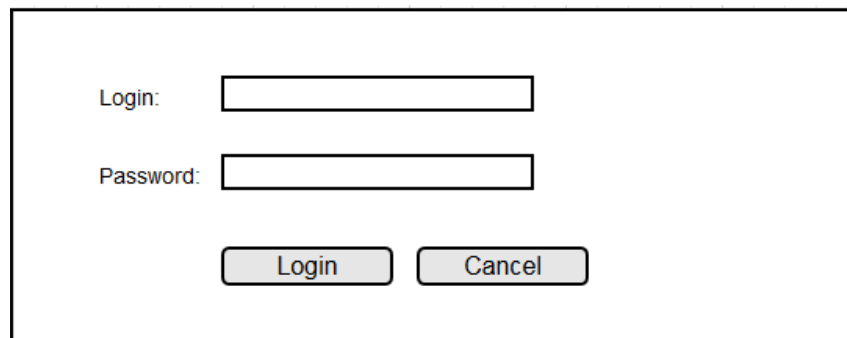
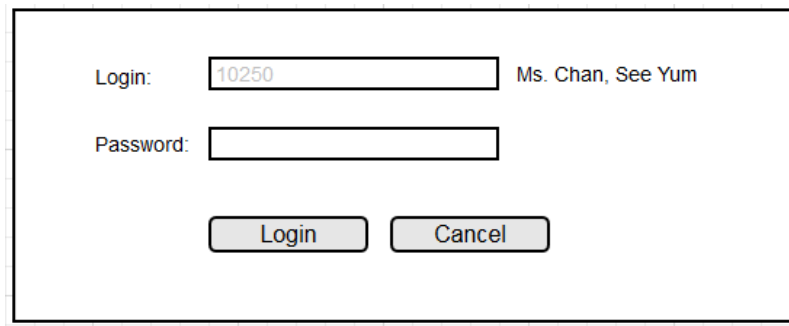


Figure 1.2a – Staff Login Form

- Use the MySQL/MSSQL database called “tickettailor_db” to develop all your modules. “Staff” table will be created in this database.
 - Form name: frmLogin

- Form caption: Login Form
- In order to keep the staff name more flexibility, you are required to divide the staff name into three parts which include “Title”, “Surname”, and “Given name”. For example, the staff “Chan See Yum” should as kept as Ms. Chan See Yum.
- The “Title”, “Surname” and “Given name” should be displayed after the user input the login ID in the screen.



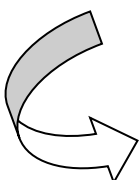
The image shows a login form with the following elements:

- A label "Login:" followed by a text input field containing the value "10250".
- To the right of the "Login:" input field, the text "Ms. Chan, See Yum" is displayed.
- A label "Password:" followed by an empty text input field.
- Below the input fields, there are two buttons: "Login" and "Cancel".

Figure 1.2b – Displaying the Full Name of Staff

- Staff ID must be under 10 digits (Minimum 2 digits) and starting from lower letter. A basic authentication must be implemented for security requirements from the client.
- In order to enhance the system security, the password should be encrypted by one of the hash function like md5, sha-1 or others. Decryption process will be used in verification of the password during login.
- Each staff will use their staff ID or email account as a login name and password to log into the specified application.
- Staff details will be given in an Excel file which is in this session folder, you can import staff data after the modifications of the source file.

- After logged in the system, another user form should be displayed for module selection. The form name should be “frmModuleSelection” with caption “Module Selection”. Please refer to Figure 1.2c for the sample output.
- A photo field called “SImage” must be stored in the Staff table. The developer can choose to store the photos or photo links in the field.
- The photo of the login staff should be displayed on the top of “Module Selection” form after logged in. All staff photos can be found in this session folder.
- Wrong StaffID or Password input message should be prompted when the staff uses the invalid login information.
- The caption “Module Selection” should be shown in the text property in the Module Selection Form.
- The default names of menu buttons in the Module Selection Form are Module 1, Module 2, Module 3, and Module 4. The form must have one more menu button “Sign Out” at the last of the menu. When the user presses the “Sign Out” button, the welcome message “Welcome! Chan Tai Man!” and the photo will be gone. Login Form will be displayed again for “Sign In”. (Chan Tai Man is the sample staff name which is constructed by Surname + Givenname).



Login:

Password:

Welcome! Mr. X

Figure 1.2c – Module Selection Form

ID	Name	Description
2.1	Air Ticket Enquiry Module	A flight schedule enquiry interface in C# application for further application development. The development involves the Air Ticket Enquiry Form with Flight Schedule table. It is used for helping the staff of Ticket Tailor to search the air ticket for customers. Customers also can use this enquiry UI at the kiosk.

You are required to develop a Flight Schedule Enquiry module under the C# project.

- Create a Flight Schedule Enquiry Form User Interface under the C# project.
 - Form name: frmAir
 - Form caption: Air Ticket Enquiry
- Create a link in the “Module Selection” form which can go to the form of “Air Ticket” (See Figure 2.1a)

The diagram shows a rectangular form titled "Module Selection Form (Air Ticket)". Inside the form, there are five rectangular buttons. Four buttons are arranged in a horizontal row at the top: "Air Ticket", "Menu2", "Menu3", and "Menu4". Below the "Air Ticket" button, there is a single button labeled "Logo". The rest of the form area is empty.

Figure 2.1a – Module Selection Form (Air Ticket)

- Staff can use the textbox and other controls as the keywords to search all the data in the Flight Schedule table. The search result would be shown in the data grid. The Figure 2.1b will give you a reference of how to construct the grid and input keyword controls.

- Number of Infant is also displayed in the input keyword UI for creating the order later on.
- In the data grid, show the Airline photos and IATA codes of “Airline” in ALL upper letter case instead of Chinese name, the Airline table with IATA codes could be found in Figure 2.1c.
- In the Air Ticket form, a separate data table should be created for storing all available airline (Photo and Chinese name) with their one of the prices.

							
	吉祥航空	上海航空	中國東方航空	香港航空	國泰航空	港龍航空	
直飛	HKD 923	HKD 1298	HKD 1298	HKD 3083	HKD 3990	HKD 4071	
1程中轉	—	—	—	—	—	—	

- All of the searching results of air ticket must be shown in the data grid which is bounded in the first tab control called “Default” such as Fight No., all date and time of flight schedule, flight class, prices and tax. The “Default” tab control is showing the air ticket result by departure date in ascending.
- Tax should be calculated as 7.5% of ticket price.
- The second tab control called “Departure” is showing the air ticket result by departure time in ascending.
- The third tab control called “Arrival” is showing the air ticket result by arrival time in descending.
- The forth tab control called “Price” is showing the air ticket result by ticket price in ascending.

- Some of the flight schedules are using direct flight mode to take the passengers to the destination directly. Some are using indirect flight schedules which is more than one route. The system must handle this situation to show the detailed indirect flight info to the users when the user selects an indirect flight record.
- A button “Order” should be prepared in each air ticket line for ticket ordering.

The screenshot shows an air ticket enquiry interface. At the top, there are input fields for origin (由 香港), destination (至 上海), departure date (出發日期 10/08/2015), and return date (回程日期 06/09/2015). Below these are fields for adult count (成人 2), child count (小童 1), cabin class (客艙級別 經濟艙), and airline (航空公司). A search button (搜尋機票) is on the right. A checkbox for "Direct flights only" (僅搜直飛) is also present.

Below the search fields is a table of flight options. The table has columns for flight type, airline, flight number, price, and duration. The first row shows a direct flight (直飛) from HKG to SHA with a price of HKD 923. The second row shows a 1-stop flight (1程中轉) with a price of HKD 1298. The third row shows a 2-stop flight (2程中轉) with a price of HKD 1298. The fourth row shows a 3-stop flight (3程中轉) with a price of HKD 3083. The fifth row shows a 4-stop flight (4程中轉) with a price of HKD 3990. The sixth row shows a 5-stop flight (5程中轉) with a price of HKD 4071.

Annotations include:

- A curved arrow pointing from the search fields to the flight results table.
- A box labeled "Tab Control" with arrows pointing to the flight details tabs (航班資料, 經濟艙, 機票條款).
- A box labeled "Data Grid" with arrows pointing to the flight details table.
- Another box labeled "Data Grid" with arrows pointing to the flight details table.

Figure 2.1b – Air Ticket Enquiry with Input Keyword Controls

CarrierName	IATA
中華航空	Ci
長榮航空	br
國泰航空	cx
香港航空	hx
港龍航空	Ka
全日空航空	Nh
日本航空	JL
中國東方航空	mu
新加坡航空	Sq
美國聯合航空	ua
阿聯酋航空	Ek
泰國國際航空	tg

Figure 2.1c – Airline Table with IATA codes

ID	Name	Description
2.2	Hotel Schedule Enquiry Module	A hotel schedule enquiry interface in C# application for further application development. The development involves the Hotel Schedule Enquiry Form with HotelSchedule table. It is used for helping the staff to search the hotel schedule for customers. Customers also can use this enquiry UI at the kiosk.

You should design a “HotelSchedule” table in the database. The system will use the information in the “HotelSchedule” table to develop the Hotel Schedule Enquiry modules in the Ticket Tailor system.

- Create a Hotel Schedule Enquiry Form User Interface under the C# project.
 - Form name: frmHotelSche
 - Form caption: Hotel Schedule Enquiry
- Create a link in the “Module Selection” form which can go to the form of “Hotel Schedule Enquiry” (See Figure 2.2a)

A screenshot of a software interface titled "Module Selection Form (Hotel)". It features a grid of five buttons: "Air Ticket", "Hotel", "Menu3", "Menu4" in the top row, and "TT Logo" in the bottom row. The "Hotel" button is highlighted with a thicker border. The buttons are arranged in a simple, clean layout within a rectangular frame.

Figure 2.2a – Module Selection Form (Hotel)

- Two data grids for storing the hotel and hotel room retails
- Staff can use the textbox and other controls as the keywords to search all the data in the Hotel Schedule table. The Figure 2.2b will give you a reference of

how to construct the grid and input keyword controls. All of the label captions should be prepared for the input UI.

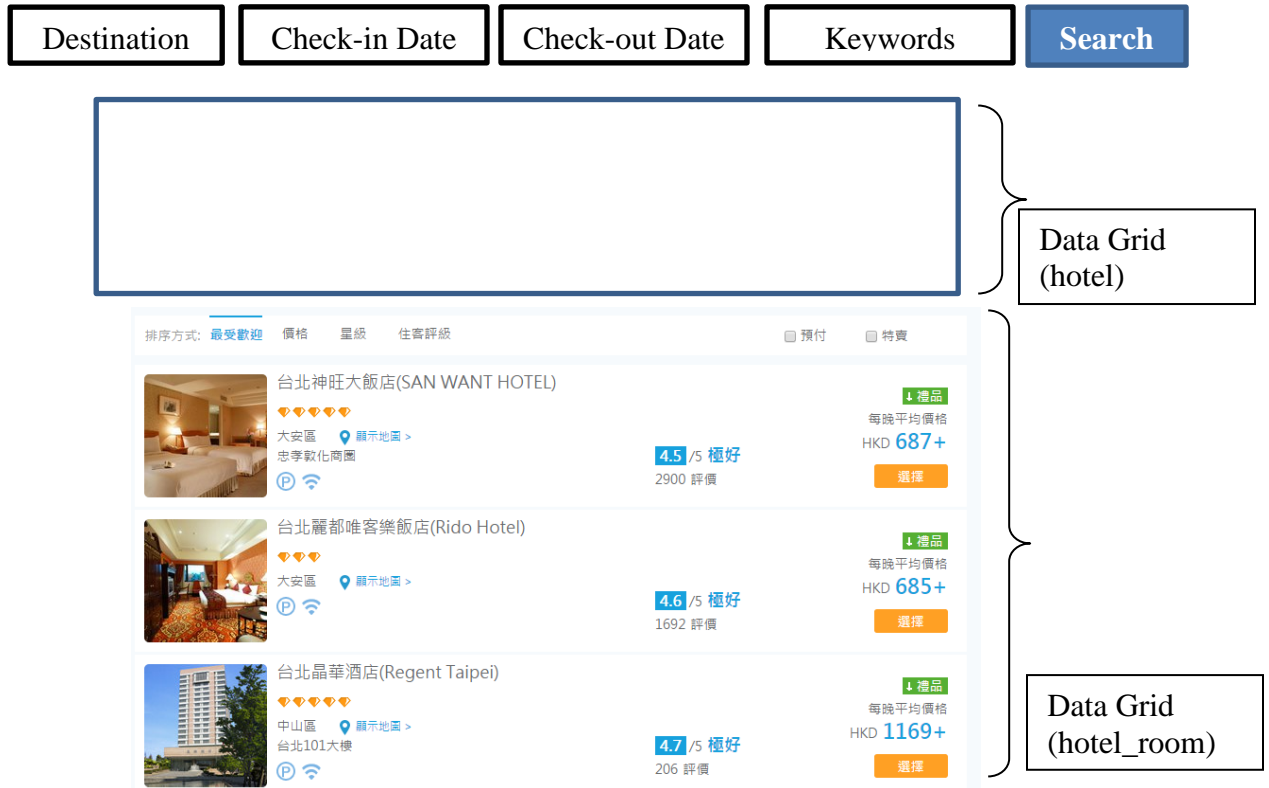


Figure 2.2b – A Sample of Hotels Enquiry Layout

- According to the Figure 2.2b, allocate the destination, check-in date and check-out date as the input UI for hotel enquiry. The basic hotel information (search result) should be listed in the first data grid. It includes hotel name, star rating, region, address. The detail hotel information will be listed in the second data grid such as room size, room type, room description, fare and etc.
- The search result of hotel information would be shown in the first data grid. When the staff select a record of the first data grid, the hotel room details would be displayed in the second data grid.

- Available hotel room should be displayed in the combo box. When the user select the combo box, the relevant room price would be displayed to the users.
- Four buttons are created on the top of the result data grid. The first “Default” is for showing the hotel schedule by the name in English.
- The second button is showing the hotel schedule by the “Rating” in descending. The number of rating will not showed in the data grid. Please refer to the Figure 2.2c to apply the word descriptions of the hotel rating.
- The third button is showing the hotel schedule by “Price” in ascending.
- The forth button is showing the hotel schedule by “Star” in descending
- A button “Reserve” should be prepared in each room details line for room reservation.

Rating	Description
3.0 – 3.5	Satisfactory
3.6 – 4.0	Good
4.1 – 4.7	Fine Good
4.8 – 5.0	Excellent

Figure 2.2c – Hotel Rating Description

ID	Name	Description
2.3	Air Ticket Order and Hotel Schedule Reservation	Process order of air ticket and hotel reservation in a form and store the ordered information into the database.

- Create a customer table and import the data which is stored in the EXCEL files.
- Create a Hotel Schedule Enquiry Form User Interface under the C# project.
 - Form name: frmOrder
 - Form caption: AirTicket + Hotel Order Form
- When the staff order the air ticket and hotel schedule for the customers, all the related orders will be displayed in this form.
- The orders will be divided into two major parts in one single form. The upper part of the form is Air Ticket, the lower part of the form is Hotel Schedule. Two parts also have an amount of order subtotal. A grand total should be displayed on the bottom of the form.
- Each part should have a separator with title and line to distinguish which part of order are displaying to the staff.
- Please refer to Figure 2.3a for the sample screen layout design of the part of air ticket.
- Please refer to Figure 2.3b for the sample screen layout design of the part of hotel schedule.

The diagram shows a screen layout for an 'Air Ticket' section. At the top, a title bar contains the text 'Air Ticket'. Below this, there are four input fields arranged horizontally: 'FlightDate', 'FlightNo', 'Origin', and 'Dest'. Underneath these, there are three rows of input fields. The first row contains 'Adult Price', 'Tax', and 'Person'. The second row contains 'Child Price', 'Tax', and 'Person'. The third row contains 'Infant Price', 'Tax', and 'Person'. At the bottom right of the layout, there is a 'Subtotal' button.

Figure 2.3a - the sample screen layout design of the part of air ticket.

The diagram shows a screen layout for a hotel schedule section. It features four input fields at the top: 'Hotel Name', 'Country', 'Check-in', and 'Check-out'. Below these, there are two rows of input fields. The first row contains 'Room Type1', 'Price', and 'Night'. The second row contains 'Room Type2', 'Price', and 'Night'. At the bottom right, there are two buttons: 'Subtotal' and 'Grand Total'.

Figure 2.3b - the sample screen layout design of the part of hotel schedule.

- For promoting the bundle discount to the customer who orders both air ticket and hotel schedule, \$150 discount will be offered to the customer.

- In order to promote the other discount to the special customers, they will receive 10% extra discount when the year of birth is 1976, 1977, 1985, 1991.
- All the discount amount should be displayed in the order form.
- A “Confirm Order” and “Cancel Order” buttons should be created for saving the order into the database. The structure of air ticket order table and hotel schedule order table can be found in this session folder. You must create the order related table first for saving these orders.
- The minimum order of hotel reservation is 1 night. It is a “Default” setting in the form. When the field of night is zero, the button of “Confirm Order” would be disabled.
- The system needs to process the order (save the orders into the database) when the staff presses the “Order” button, the form will be gone.
- The system have to cancel the order when the staff press the “Cancel” button, the form will be gone but it needs to extract the order records into an external file (Excel, PDF or Text file) to the customer as a reference information. Once the external file is ready, the system is required to open the text file for the customer automatically.
- The font color of the air ticket order should be in Brown, the font color of the hotel schedule order should be in Black. Bold effect must be applied for better viewing. Colors are suggestions only.

ID	Name	Description
2.4	Cruise Tour Enquiry Form and Attraction Enquiry Form	Cruise Tour and Attraction enquiries interface in C# application for further application development. The development involves the Cruise Schedule Enquiry Form with Cruise Schedule table. Attraction Enquiry Form with Attraction table. It is used for helping the staff to search the relevant traveling information for individual travelers.

You should design a “CruiseSchedule” table in the database. The system will use the information in the “CruiseSchedule” table to develop the Cruise Schedule Enquiry modules in the Ticket Tailor system.

- Create a Cruise Schedule Enquiry Form User Interface under the C# project.
 - Form name: frmCruiseTour
 - Form caption: Cruise Tour Enquiry
- Create a link in the “Module Selection” form which can go to the form of “Cruise Tour Enquiry” (See Figure 2.4a)

The figure shows a rectangular window representing a 'Module Selection' form. Inside the window, there are five buttons arranged in two rows. The top row contains four buttons: 'Air Ticket', 'Hotel', 'Cruise', and 'Menu4'. The bottom row contains one button: 'TT Logo'.

Figure 2.4a – Module Selection Form (Cruise)

- Create a link in the “Module Selection” form which can go to the form of “Cruise Tour Enquiry” (See Figure 2.4a)

- The cruise information is stored in this session folder. You can import the data into the database and use the tab name as the table name.
- In the cruise tour form, start date and cruise organizer should be the search keywords for cruise tour information. All the information in the CruiseSchedule table should be displayed in the form after the searching is done. The staff should select at least one criteria to search the cruise tour. Otherwise, a message would be promoted for no selection. Please refer to Figure 2.4b for the cruise enquiry form.
- All of the listed information of cruise tour lines must be grouped by tour day. The grouping of the tour day should be displayed dynamically in the Figure 2.4b.

The diagram illustrates the layout of a cruise enquiry form. At the top, there are three input fields: 'Start Month', 'Cruise Organizer', and a 'Search' button. Below these, the results are grouped by duration. A blue arrow labeled '4 days' points to a group containing two text boxes: 'Cruise Tour line1' and 'Cruise Tour line2'. Another blue arrow labeled '6 days' points to a group containing two text boxes: 'Cruise Tour line3' and 'Cruise Tour line4'.

Figure 2.4b – The sample output of the cruise enquiry form

- The field “Info” is used for storing the PDF file name of the particular cruise tour. The PDF file is ready in this session folder.
- A button “Book” should be prepared in each cruise tour line for the cruise ordering.

- Create a link in the “Module Selection” form which can go to the form of “Attraction Enquiry” (See Figure 2.4c)

A screenshot of a web form titled "Module Selection Form (Attraction)". The form contains five buttons: "Air Ticket", "Hotel", "Cruise", "Attraction", and "TT Logo". The "Attraction" button is highlighted with a blue border. The "TT Logo" button is located below the "Air Ticket" button.

Figure 2.4c – Module Selection Form (Attraction)

- Create an AttractionEnquiry Form User Interface under the C# project.
 - Form name: frmAttraction
 - Form caption: Attraction Enquiry
- The attraction information is stored in this session folder. You can import the data into the database and use the tab name as the table name.
- In the attraction enquiry form, city name is used as a search key to list all related attraction details to the staff. When the user type the keywords in the textbox (E.g “Tok”, it will show the related available city for the selection automatically (E.g. “Tokyo”). Please refer to Figure 2.4d for a sample layout.



Figure 2.4d – Sample layout of search key of attractions

- The search results would be look like the Figure 2.4e. It is a grid format with a photo, attraction name, duration, cancellation and all the price type (E.g. Adult and Child). If the attraction need charged for cancellation, please highlight the data after the text “Cancellation:” in Cranberry color. Otherwise, show and highlight it after the text “Cancellation:” in Teal color. You may refer to the color code for Cranberry (#9F000F) and the color code of Teal (#008080).

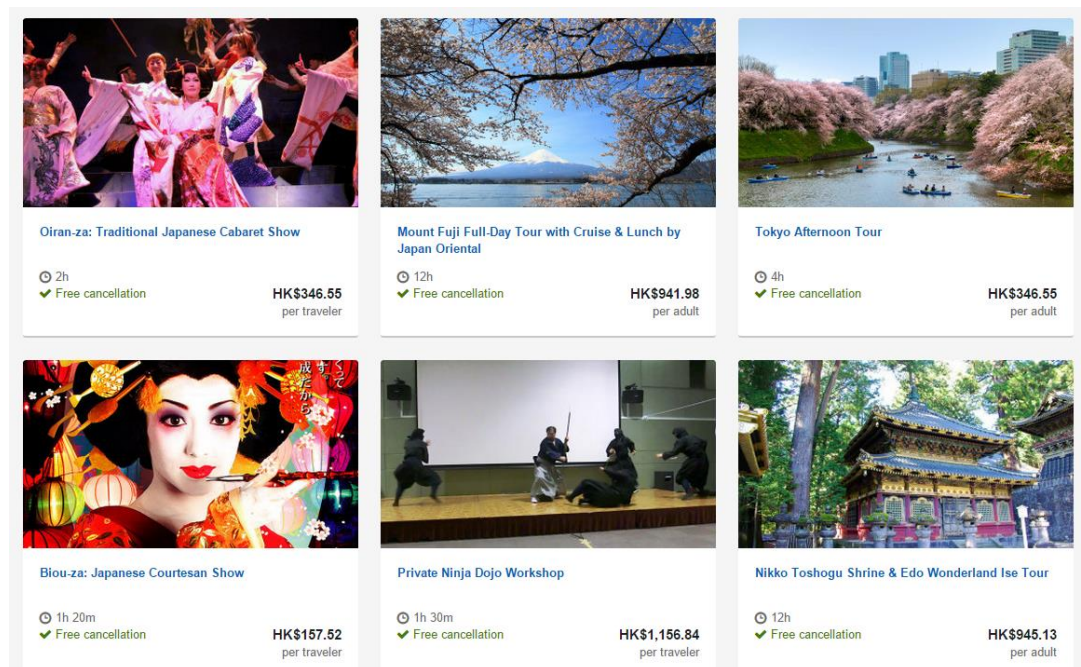


Figure 2.4e – Sample layout of searching result of attractions

- The prices of the booking are divided into the category of admission tickets. Show all the possible category prices in the searching results. Normally, it has adult and child. The format of displaying ticket prices is “price / category”. For example “\$200 / Adult”. If it have other category prices to show, it can be showed in the next line.
- The staff can click the attraction photo or click the “Order” button to link to the ordering form. The “Order” button should be appeared behind the price (up or down). The ordering process will be introduced and implemented in the next session.

ID	Name	Description
3.1	Cruise Tour Booking Module	It is an extension of the cruise enquiry form. Staff can select a particular cruise tour in the cruise enquiry form and click the “Book” button in the cruise tour line. Another form would be displayed to process the order.

- Develop the Cruise Tour Booking module under the Cruise Tour Enquiry Form (frmCruiseTour).
 - Form name: frmCruiseBooking
 - Form caption: Cruise Tour Booking
- When the staffs select a cruise tour line for booking, they can click “Book” button to reserve the tour.
- Display all booking information in the Cruise Tour Booking form. Please refer to Figure 3.1a for a sample of booking.

Cruise No	Cruise Name	TourDay	StartDate	
		Number of Adult	Tour Fare	Subtotal of Adult
		Number of Child	Tour Fare	Subtotal of Child
				Grand Total

Figure 3.1a – Cruise Tour Booking Form

- All of the related labels should be added in the cruise tour booking form.
- A combo box should be prepared for selecting a customer to the booking.
- The tour fares are listed in the “CruiseSchedule” table. The default number of adult is 1, staff can modify the number of participant which is required by the customer. For the price of child, it is calculated as 60% of adult price.
- Basically, all the controls in the booking form cannot be modified except the number of participant. When the number of participant is updated by staff, the subtotal and the grand total should be re-calculated.
- PDF file is needed and showed in the Cruise Tour Booking form for customer enquiry.
- The fields of orderDate, orderBy, CustID should be saved into the Cruise Booking. orderDate is the order placing date. orderBy is the field for storing staff ID those record is operated the particular staff. CustID is storing the customer id.
- The buttons “Confirm” and “Cancel” should be ready for staff to confirm the ordering process or cancel the booking. The confirmed booking records should be saved into “CruiseBooking” Table.

ID	Name	Description
3.2	Attraction Booking Module	It is an extension of the attraction enquiry form. Staff can select a particular attraction in the attraction enquiry form and click the “Order” button in the attraction. Another form would be displayed to process the order.

- Develop the Cruise Tour Booking module under the Cruise Tour Enquiry Form (frmAttractionEnquiry).
 - Form name: frmAttractionBooking
 - Form caption: Attraction Booking
- When the staff select an attraction line for booking, they can click “Order” button to reserve the attraction.
- Display all booking information in the Attraction Booking form. Please refer to Figure 3.2a for a sample of booking.

The diagram shows a rectangular form layout with several labeled boxes. At the top, there are four boxes: 'Attraction', 'Duration', 'Cancellation', and 'City'. Below these, on the left, is a larger box labeled 'Photo'. To the right of the 'Photo' box, there are two rows of boxes. The first row contains 'Number of Adult', 'Ticket Price', and 'Subtotal'. The second row contains 'Number of Child', 'Ticket Price', and 'Subtotal'. At the bottom right, there is a box labeled 'Grand Total'.

Figure 3.2a – a sample of attraction booking layout

- All of the related labels should be added in the attraction booking form.
- A combo box should be prepared for selecting a customer to the booking.
- All the attraction prices are listed in the “AttractPrice” table. The default number of adult is 1, staff can modify the number of participant which is required by the customer.

- Basically, all the controls in the booking form cannot be modified except the number of participant. When the number of participant is updated by staff, the subtotal and the grand total should be re-calculated.
- Some of the attractions have a different level of admission tickets, show the all possible ticket packages to the attraction booking form and leave the number of participant as zero. Default package name is “Standard”. Please refer to the Figure 3.2b for the ticket packages.

Attraction	Package	Adult	Child
Yangmingshan National Park	Star	800	600
Universal Studios Singapore	World-Class	1200	900
Night Safari Adventure	Gold Pass	880	650
DisneySea	Premium	650	350
DisneyLand	Premium	800	400
Blue Mountain	President	2200	1400

Figure 3.2b – Attraction Ticket Packages

- The fields of orderDate, orderBy, CustID should be saved into the Cruise Booking. orderDate is the order placing date. orderBy is the field for storing staff ID those record is operated the particular staff. CustID is storing the customer id.
- The buttons “Confirm” and “Cancel” should be ready for staff to confirm the ordering process or cancel the booking. The confirmed booking records should be saved into “AttractionBooking” Table.

3.3 Transportation Fleet Management Module

ID	Name	Description
3.3	Transportation Fleet Management Module	Create a form for transportation fleet management. The customer who booked an attraction that are qualified to request a “Car” or “Coach” for pick-up and drop-off at the specified location.

The system provides transportation services to the customer who has the booking of attraction. The status should be added into the attraction booking table that is the tracking information of the transportation. The life-cycle of the transportation status started with “Self Organized”, “Car” or “Coach”, “Driver”, “Confirmed”. Please refer to Figure 3.3a for the State Diagram of the transportation fleet cycle.

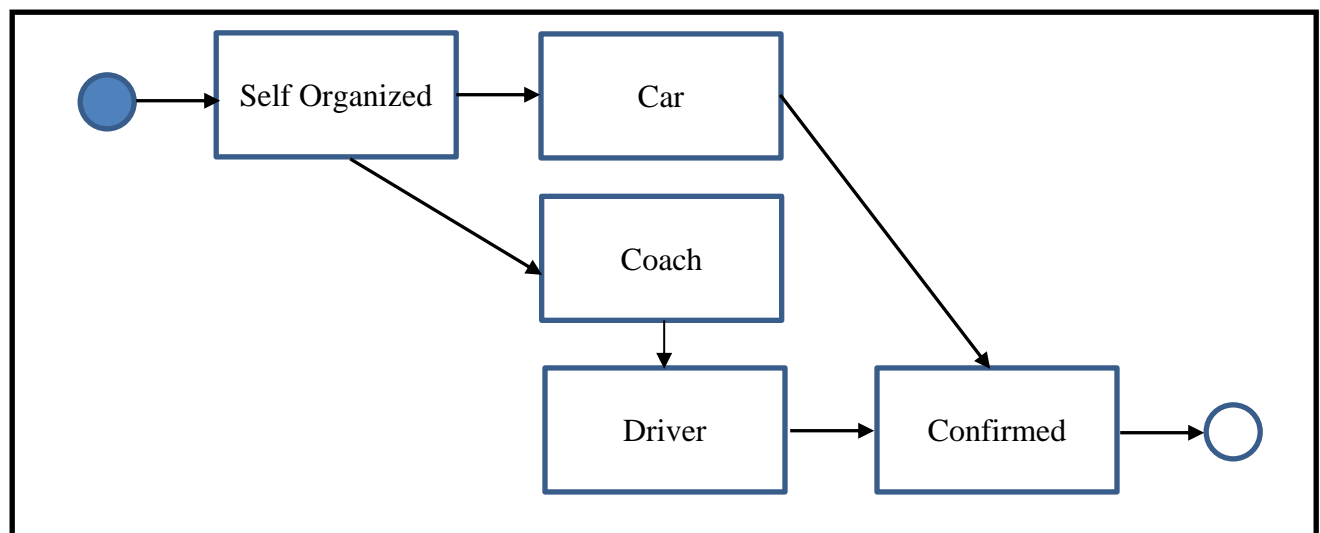


Figure 3.3a – State Diagram of the transportation fleet cycle.

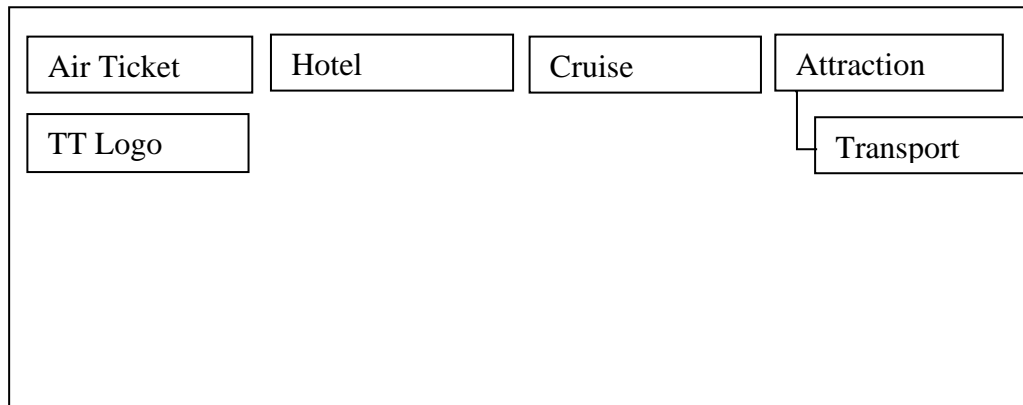


Figure 3.3b – Module Selection Form (Transport).

- Create a Transportation Fleet Management Form under the C# project.
 - Form name: frmTransport
 - Form caption: Transportation Fleet Management
- Create a sub-menu under the attraction menu in the “Module Selection” form which can go to the form of “Transportation Fleet Management” (See Figure 3.3b)
- The transportation information is available in this session folder. You can import the data into the database and use the tab name as the table name.
- Arrange the column data of “Vehicle Type” in the proper format. For example, “car” will be transformed to the proper format “Car”.
- In the form of Transportation Fleet Management, a data grid of Attraction Booking is displayed for the staff selection. A combo box should be created for showing attraction customer which is on the top of data grid. It is for filtering the attraction booking records. This grid is bounded by a groupbox control with the caption called “Attraction Booking”.
- All the status of the attraction bookings are in the starting state which is listed in the Figure 3.3a.

- Create a tab control with two pages under the first data grid. The second data grid will be placed in the first page of the Tab control provided by Visual Studio. The second tab is for showing booked vehicle with its attraction. Please refer to Figure 3.3c for the details

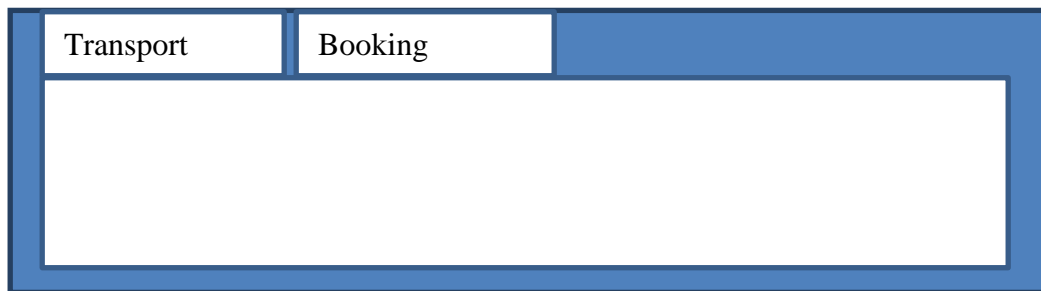


Figure 3.3c – Tab Control with two pages

- In the first tab, the second data grid will appear here that is for showing all vehicle details from the “Vehicle” table. By default, if no selection in the first grid, no data will show in the second grid. A combo box is ready on the top of the second grid for filtering the Vehicle Type.
- The second data grid with the Tab control is bounded by a groupbox control with the caption called “Transportation”.
- The staff will click the “Book” button to pass the booking record to the Booking tab. The status will be changed to “Car” or “Coach” that is belongs to the type booked vehicle and it will be saved into the attraction booking record. The book button will be placed in each vehicle details line in the second data grid.
- In the second page of tab control, the status information must be bold in red color when the status is not equal to “Confirmed”. If it is equal to “Confirmed”, it will be bold and changed to blue color.
- Please refer to the Figure 3.3d to construct the “Booking” page in the Tab control.

Figure 3.3d – Sample layout of the Booking Tab

- According to the Figure 3.3d, the third data grid is for showing the equipment details for staff selection. By default, the equipment data grid will only show the particular type of record which depends on the selected type of vehicle from the first tab.
- Staff will select date from the “Pick-up Date” and “Drop-off Date”, the “Book Day” will be calculated automatically. The transportation charges will be calculated by times the book day because transportation charge is counted per day. The equipment charge is a one-off item and NOT counted per day.
- Staff needs to click “Confirm” button to confirm the booking. Then, the status will be changed to “Confirm” and it will be saved into the attraction booking record. Before the status “Confirmed”, “OK” button is disabled for user click. “Cancel”

button is anytime available for cancel this booking. “OK” button is for saving all the transportation booking with its equipment to the equipment list table.

- The fields of orderDate, orderBy should be created in the Vehicle Booking. orderDate is the order placing date. orderBy is the field for storing staff ID those record is operated the particular staff.
- The confirmed transportation booking records should be saved into “VehicleBooking” Table.
- Staff can select more than one equipment for the vehicle booking, the equipment charges will be accumulated and displayed in the textbox of “Equipment Charges”. The equipment booking will be saved into the table “EquipmentList”.
- “EquipmentList” is a table for storing the booked equipment for each vehicle booking. Please refer to this session folder to access the table.

3.4 Driver and Roster for Transportation Bookings (Optional)

ID	Name	Description
3.4	Driver and Roster for Transportation Bookings	Modify the Transportation Booking Module and apply the driver and its roster to the vehicle bookings for assigning the driver to the vehicle and recording the salary of the driver.

- Add three fields into the Vehicle Booking table for recording the driver with its roster. The additional fields are “PickupDate”, “DropoffDate”, and “DriverID”. Driver is one of the type of staff in the staff table. In the existing staff table, the type of staff are classified as “Officer”.
- You can refer to this session folder to import all of the driver to the database. Driver roster is also available in this session folder for assigning the driver into the vehicle booking.
- Figure 3.4a is the driver roster for the coach only. Please update the records into the database table according to the Figure 3.4a if it is necessary. Figure 3.4b is the timeslot mapping about the available drivers.

Staff Name	Weekday			Weekend		
	7am-12pm	1pm-6pm	7pm-11pm	7am-12pm	1pm-6pm	7pm-11pm
Kwong Johnny	✓			✓	✓	
Lam Sze Kit		✓				✓
Law Ming Fai	✓				✓	
Ho Yin			✓		✓	
Wu Richard			✓			
Lam Chris		✓				

Figure 3.4a – Driver Roster for Weekday and Weekend

Time period	Time slot
7am-12pm	1
1pm-6pm	2
7pm-11pm	3

Figure 3.4b – Timeslot mapping

- Weekday involves Monday to Friday, weekend involves Saturday and Sunday.

- If the customer book an attraction with a coach booking, available drivers will be shown in a list box for selection. The system will check the pick-up date and compare with the driver roster to show the available drivers. List box should be disabled with default listed item “Non-available” when the customer booked an attraction with a car booking.
- The relevant driver cost will be recorded into vehicle booking table for salary calculation. The recorded field name is “DriverCost”.
- According to the driver roster, DriverCost will be increased 1.5 times when the pick-up date is weekend.
- When the staff select a driver from the list box, a confirmation dialog will be prompted for assigning the driver to the coach. The status will be changed to “Driver” and saved it into the attraction booking record.
- If the attraction record is in “Coach” state, “Confirm” and “OK” buttons would be disabled. Once the state changed from “Coach” to “Driver”, “Confirm” button would be released.
- Implement the checking mechanism for avoiding the customer to select the booked requirements again for the booked vehicle.

3.5 Data Report of All Bookings (Optional)

ID	Name	Description
3.5	Data Report of All Bookings.	Create a menu item in the Module Selection Form to develop a data report for particular customer which contains all bookings. The report content includes Flight, Hotel, Cruise, Attraction and Vehicle bookings.

- Please refer to Figure 3.5a for create a menu item for the data report of all bookings.

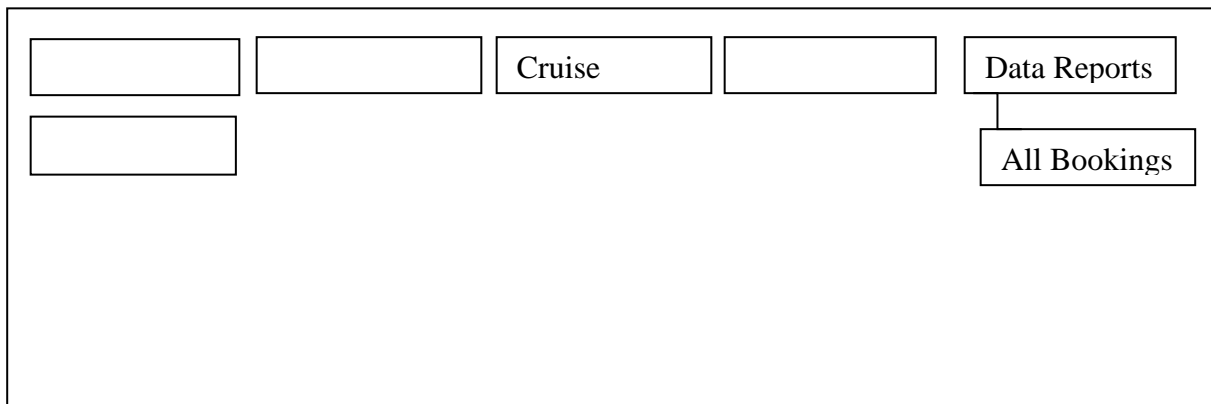


Figure 3.5a – Module Selection Form (Data Report for All Bookings)

- Create an all bookings report form under the C# project.
 - Form name: frmAllBookings
 - Form caption: All Bookings
- The report should contain all relevant details with booked fees. The subtotal shows the total fees of each type of bookings and grand total shows total fees of all subtotal for a particular customer. The staff can select a customer from a combo box to generate the report. Refer to Figure 3.5b for the sample layout of the report.
- Four buttons should be created on the top of form to generate a WORD or PDF document as a record that is a booking confirmation for the particular customer. The four buttons include “Flight”, “Hotel”, “Cruise”, and “Attraction”. The attraction

booking should have the related vehicle bookings (if any). Please refer to Figure 3.5c for the sample layout of the document.

<div>Customer</div>	
<div>Data Report for All Bookings</div>	
<div>Flight Booking Details</div>	<div>Flight Booking Subtotal</div>
<div>Hotel Booking Details</div>	<div>Hotel Booking Subtotal</div>
<div>Cruise Booking Details</div>	<div>Cruise Booking Subtotal</div>
<div>Attraction Booking Details</div>	<div>Attraction Booking Subtotal</div>
<div>Vehicle Booking Details</div>	<div>Vehicle Booking Subtotal</div>
<div>Equinment Details</div>	<div>Equinment List Subtotal</div>

Figure 3.5b – The Sample Layout of Data Report of All Bookings.

- Use different color with 14pt font size in the subtotal and grand total of the data report for all bookings. Please refer to Figure 3.5d for the color usage.
- Staff should select a customer in the All Bookings Form and then generate the confirmation document for the particular bookings. An error message should be prompted if the staff do not select a customer and click one of the buttons to generate the document.

Figure 3.5c – The Sample Layout of the Confirmation Document of Flight Bookings.

Total Type	Color
Flight Booking Subtotal	ForestGreen
Hotel Booking Subtotal	DarkCyan
Cruise Booking Subtotal	SteelBlue
Attraction Booking Subtotal	Peru
Vehicle Booking Details	Purple
Grand Total	DarkRed

Figure 3.5d – Color usage for the Subtotal and Grand Total

- When it is in the situation of no record showed for the particular bookings in the Data Report of All Bookings, the words “No bookings” in bold with corresponding color will be displayed, the color can be found in Figure 3.5d.

4.1 Data Report for Staff Performance (Optional)

Sales managers and Account managers want to see the graphs of the results of the higher salary payment staff for analyzing their performance. This module must contain another Tap control to show all the related data reports / graphics that let the sales managers view all statistical plots as below:

Deliverables		
ID	Name	Description
4.1	Data Reports / Graphics for Data Analysis	Five data reports with different types of graphics should be generated in submenu "Performance" for analysis to meet the system requirements.

- Create a submenu called "Performance" under the menu "Data Report" in the form of Module Selection.
- Create a form under your developing C# project from the previous module.
 - Form name: frmPerformance.cs
 - Form caption: Performance
- All reports / graphics should be show in the Tab page in a Tap control. The name of the tap should be follow the titled data report / graphic.
- Data report with bar chart of a staff with his salary and retirement fund deductions with the title "Salary and Retirement Fund";
- Data report with bar chart of a staff with his/her salary (including cash prize/deduction), shop bonus, individual bonus, sales prize with the title "Total Payment for a Staff";
- Data report with pie chart of Center ID with its center bonus with title "Center Bonus";
- Graphs showing FIVE top sales staff with number of customer with the title "Top Five Sales Staff";
- Graphs showing FIVE top sales staff with sales amount with title "Top Five Sales amount" in descending order of its amount (from left to right) and this should be

indicated by an arrow, highlighted in the chart.

- A combo box should be created in the form selecting a customer for the particular report if it is required.

Notes for Students:

- Student can use Visual Studio 2010, 2012 or 2015 with MySQL database at lab.
- Data will be given, but students are free to design their own tables. You are required to do textual analysis. All the detailed requirements are the sample to demonstrate the operations. Students feel free to make assumptions and to use your own way to develop the similar functions with using the given data.
- In the Login module, you are suggested to use hash function like md5 or sha-1 (non-functional requirement).
- The system are required to use an administrator role to add, update and delete information such as attractions, hotel and flight information.
- Administrator would have “Create Users” function.
- Since this is not a web program, the requirement on GUI maybe a bit different, such as the pop-up in session 2.4. Besides, the appearance on table and tab in Visual Studio may be different. All attached figures are for reference only.
- Customer also can use the system in session 2.1 and 2.2 since the company allocates the self-service computers in the enquiry kiosk at the customer service centers.
- Student can check with data files and they can create the fixed indirect flight data for searching indirect flight schedule.
- Student have their freedom to design the hotel enquiry form in details. The instructions and figures are references only. The objective is to build user friendly UI with using the given data to search the hotel details for the staff and customers in an efficient way. This idea can be applied into other sessions.
- In the session 3.3, the transportation is not included for attraction booking, customer can book their own transportation (e.g. Car or Coach) for the particular attraction. Student can also make an assumption that the transportation part may not be necessary, or may not associate with the attraction function. The transportation can be simplified to vehicle hiring function.
- Colors are suggestions only, not a must to follow. Students have freedom in UI design and it counts too.
- The sessions 3.4, 3.5 and 4.1 are optional. Students are NOT required to do. But you can still try to develop the optional sessions to make the system more completely.