





Declaration of Original Work for CZ2002 Assignment

We hereby declare that the attached group assignment has been researched, undertaken, completed and submitted as a collective effort by the group members listed below.

We have honored the principles of academic integrity and have upheld Student Code of Academic Conduct in the completion of this work.

We understand that if plagiarism is found in the assignment, then lower marks or no marks will be awarded for the assessed work. In addition, disciplinary actions may be taken.

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Important notes:

1. Name must **EXACTLY MATCH** the one printed on your Matriculation Card.

1.0 Design Considerations

1.1 Approach Taken

The RRPSS application aims to mimic the functionalities of real life applications used by popular restaurants. The application does not have a database but will contain features to allow storage of menu items, promotional set packages and tracking of reservations. Features such as checking table vacancy is also available to ensure the restaurant is not overwhelmed by customers. If there are customers that did not adhere to the stipulated time period to arrive at their table at the restaurant, their reservation will be deemed as cancelled. Staff are able to cancel reservations if a customer informs them to do so and the table would be opened up for reservation. This extends to the real life aspect of there are only limited tables in a restaurant for a specific time period and how table reservation works.

Restaurants using the application are able to check which staff is currently working and which orders they have taken for specific tables. A monthly revenue report may also be printed for managers of the restaurant to view and track the revenue performance of the restaurant.

1.2 Principles Used

- Minimization of symptoms of Rotting Design
 - No Immobility: Different classes are created for the RRPSS application so that each class can be reused for other projects.
- Design Metrics
 - Achieve High cohesion - Each class only has one sole purpose and works cohesively with other classes.
 - Easy to maintain such that minimum effort is needed if there are changes to the RRPSS application.
- SOLID Design Principles
 - Single Responsibility Principle - Prior to implementation of RRPSS, we designed our Class Diagram with SRP in mind to ensure each class is made to do only one sole purpose.
 - Open-Closed Principle - Generic functionalities are contained within a class & it is opened as an abstraction for subclasses to extend & override with desired logic.
 - Liskov Substitution Principle - Derived classes are substitutable for its base class.
 - Interface Segregation Principle - Specific interfaces are made instead of one general purpose interface as to reduce duplication of redundant methods (not used in current implementation).
 - Dependency Injection Principle - High level modules should not depend on low level modules, which allows for the building of loosely coupled components.
- Abstraction
 - Display only essential information about each class, e.g., Person Entity only contains Person Name and Person Contact which are essential details for RRPSS.

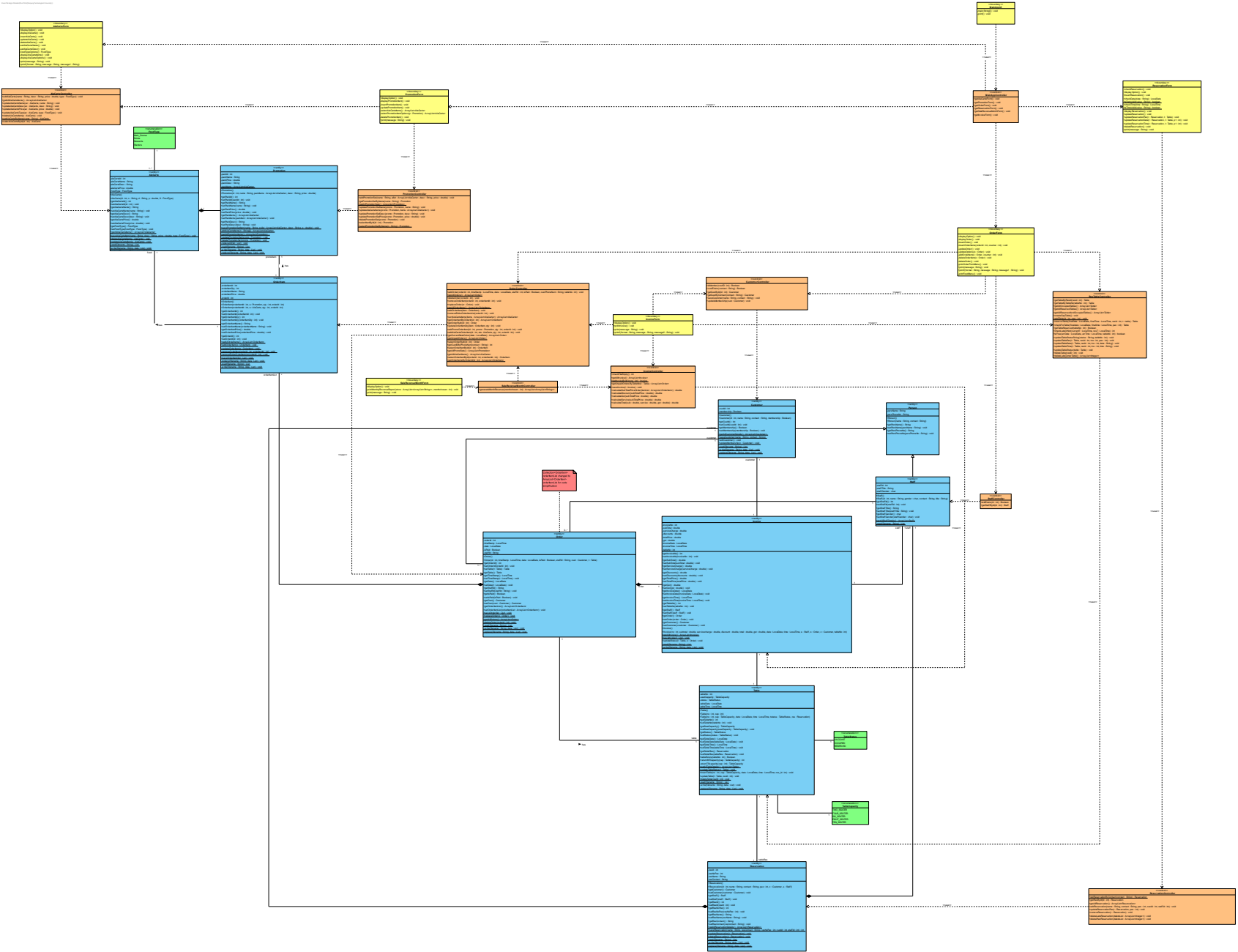
- Encapsulation
 - Use of private, protected and public variables whenever necessary. Specific methods used on a particular entity is set to private so as to not affect other entity methods when modified.
- Inheritance
 - Inheritance is a mechanism in which one object acquires all the properties and behaviors of a parent object. For example, Customer and Staff inherits the functionality of Person class such as getPersName() and getPersPhoneNo().
- Polymorphism
 - Polymorphism makes use of inheritance, but the child class overrides the methods of the parent's class by replacing or refining it depending on the needs of the child class. For example, Customer class inherits functionality from Person class, but also has its own set of functions such as getMembership() that is specific to itself.
- Entity-Control-Boundary Pattern
 - Using the Entity-Control-Boundary Pattern aids in the distribution of responsibilities to a set of interacting design elements. This pattern helps to display different views with the same data. For example, the data from the Table entity can be used for OrderForm boundary and ReservationForm boundary.

The RRPSS application strictly adheres to these design principles to ensure reliability and extendability of the application.

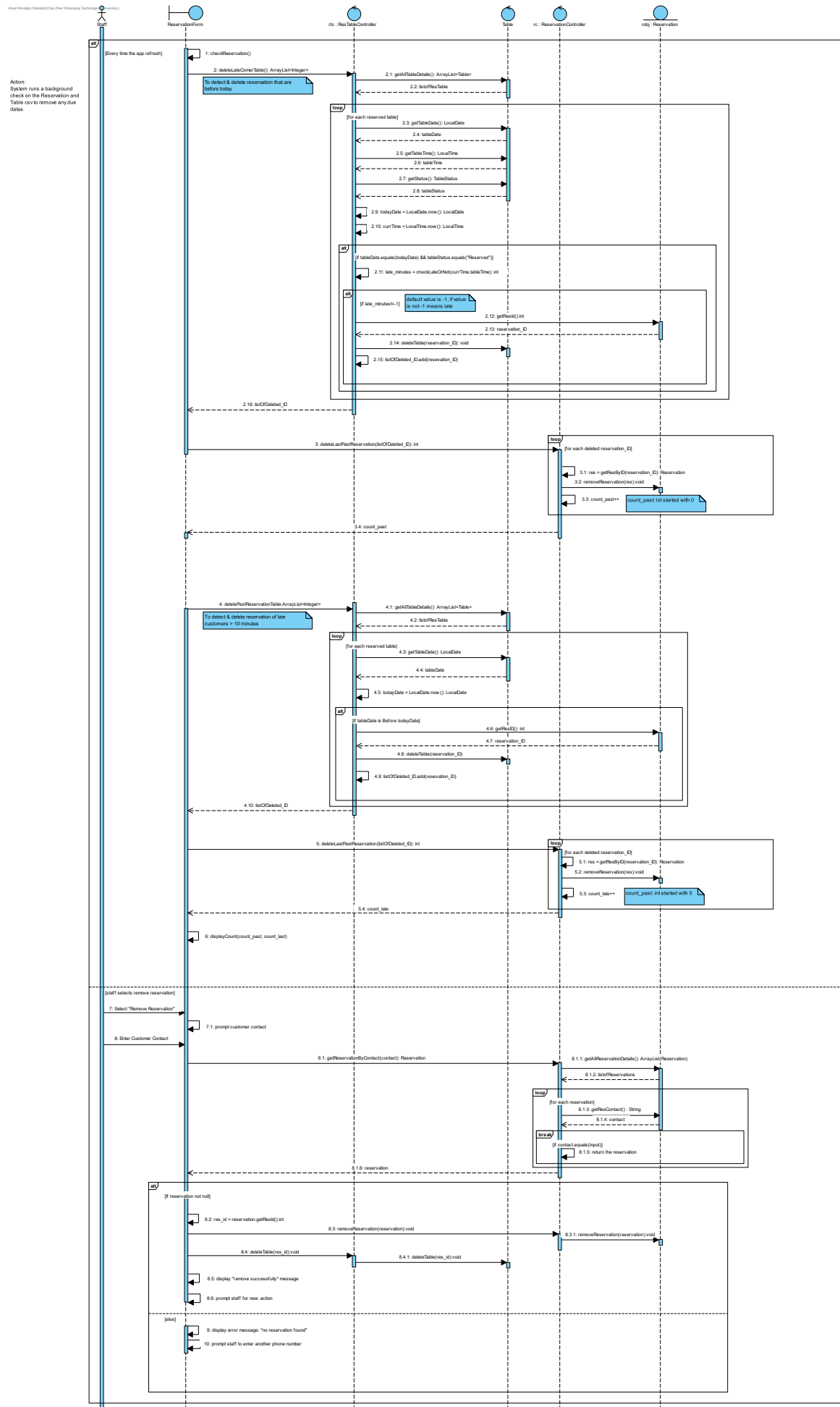
1.3 Assumptions Made [\[Blue indicates essential test cases to run during demo\]](#)

- [Reservation can only be made at most 2 weeks in advance.](#)
- [Reservation will be automatically removed if the guest does not arrive within the grace period of 10 minutes after the stated arrival time.](#)
- The currency will be in Singapore Dollar (SGD) and Good and Services Tax (GST) and service charge must be included in the order invoice.
- [Once an order invoice is printed, it is assumed that payment has been made and the table is vacated.](#)
- The restaurant is open 24/7, and is reservations-only.
- Customer with membership will be entitled to a discount.
- Promotion Sets consist of available Ala Carte Items that are discounted as a set.
- There is no requirement for access control and there is no need for authentication (login/logout) in order to use the application.
- There is no need to interface with external systems, e.g. Payment, printer, etc.
- The restaurant has 10 tables – 2 x 10-seats, 2 x 8-seats, 2 x 6-seats, 2 x 4-seats, 2 x 2-seats.
- TableID is fixed and cannot be combined/joined (e.g. join 2 x 2-seats table to form 4-seats table).
- Payment via credit card will always be successful.

2.0 Detailed UML Class Diagram



3.0 Detailed UML Sequence Diagram for Check/Remove Reservation Booking



4.0 Testing

4.1 Create Ala Carte Item

Test Case Description	Expected Outcome
Create Ala Carte Item with the following details: - Name: Korean Fried Chicken - Description: Super crispy & spicy - Price: 12.00 - FoodType: Starters	<pre> ===== Welcome to RRPSS ===== (1) Reservation (2) Orders (3) Sales Revenue Report (4) Ala Carte (5) Promotion (6) Payment (7) Exit Please enter your choice : 4 ===== Menu Options ===== 1) Display Ala Carte Items 2) Add an Ala Carte Item 3) Update Ala Carte Details 4) Delete Ala Carte Item 5) Back Please enter your choice: 2 ===== Add an Ala Carte item ===== Enter Ala Carte name: Korean Fried Chicken Enter Ala Carte Description: Super crispy and spicy Enter price for Ala Carte item: 12.00 ===== Choose the food type ===== 1) Main_Course 2) Drinks 3) Desserts 4) Starters Please enter your choice: 4 ===== Korean Fried Chicken added successfully ===== </pre>

4.2 Update Ala Carte Item

Test Case Description	Expected Outcome
Update Ala Carte Item “Korean Fried Chicken” price to \$14	<pre> ===== Welcome to RRPSS ===== (1) Reservation (2) Orders (3) Sales Revenue Report (4) Ala Carte (5) Promotion (6) Payment (7) Exit Please enter your choice : 4 ===== Menu Options ===== 1) Display Ala Carte Items 2) Add an Ala Carte Item 3) Update Ala Carte Details 4) Delete Ala Carte Item 5) Back Please enter your choice: 3 ===== Select the Food Item you would like to update ===== AlaCarte Name Price ===== 1) Shan Yao Tofu \$14.00 2) Nonya Curry Fish \$15.00 3) Roast Duck \$15.00 4) Black Sesame Paste \$4.00 5) Ice Lemon Tea \$3.00 6) Ice Flower Tea \$3.00 7) Korean Fried Chicken \$12.00 Enter 0 to return to the previous page Please enter your choice: 7 ===== Update Food Item Options ===== 1) Edit Food Item Name 2) Edit Food Description 3) Edit Food Price 4) Edit Food Type 5) Back Enter your choice: 3 Enter new Ala Carte Item Price (Original Price: \$12.0): 14 Ala Carte Item Price \$12.0 has been changed to \$14.0 ===== </pre>

4.3 Remove Ala Carte Item

Test Case Description	Expected Outcome
Remove Ala Carte Item “Japanese Fried Chicken”	<pre> ===== Welcome to RRPSS ===== (1) Reservation (2) Orders (3) Sales Revenue Report (4) Ala Carte (5) Promotion (6) Payment (7) Exit Please enter your choice : 4 ===== Menu Options ===== 1) Display Ala Carte Items 2) Add an Ala Carte Item 3) Update Ala Carte Details 4) Delete Ala Carte Item 5) Back Please enter your choice: 4 ===== Select the Food Item you would like to delete ===== AlaCarte Name Price ===== 1) Shan Yao Tofu \$14.00 2) Nonya Curry Fish \$15.00 3) Roast Duck \$15.00 4) Black Sesame Paste \$4.00 5) Ice Lemon Tea \$3.00 6) Ice Flower Tea \$3.00 7) Korean Fried Chicken \$14.00 8) Japanese Fried Chicken \$10.00 Enter 0 to return to the previous page Please enter your choice: 8 ===== Japanese Fried Chicken deleted successfully ===== </pre>

4.4 Create Promotional Set

Test Case Description	Expected Outcome
<p>Create Promotional Set with the following details:</p> <ul style="list-style-type: none"> - packName: Korean Fried Chicken Set - packDesc: Super crispy & spicy, comes with a free drink. - Food items added: Korean Fried Chicken , Ice lemon tea - packPrice: 14.00 	<pre> ===== Welcome to RRPSS ===== (1) Reservation (2) Orders (3) Sales Revenue Report (4) Ala Carte (5) Promotion (6) Payment (7) Exit Please enter your choice : 5 ===== Promotion Menu Options ===== (1) Display Promotion Set (2) Insert Promotion Set (3) Update Promotion Set (4) Delete Promotion Set (5) Return to Main Menu Please enter your choice: 2 Enter Promotion Set name: Korean Fried Chicken Set Select AlaCarte items to be added to Promotion Set: ===== Food Name Price ===== 1) Shan Yao Tofu \$14.0 2) Nonya Curry Fish \$15.0 3) Roast Duck \$15.0 4) Black Sesame Paste \$4.0 5) Ice Lemon Tea \$3.0 6) Ice Flower Tea \$3.0 7) Korean Fried Chicken \$14.0 Please enter your choice: 7 ===== Enter 0 to stop adding ===== Please enter your choice: 5 Please enter your choice: 0 Enter Item Description: Super crispy & spicy, comes with a free drink. Enter Promotion Set Price (Actual Price Combined: \$17.0): 14 Promotion Name: Korean Fried Chicken Set Item Description: Super crispy & spicy/ comes with a free drink. Containing Items: (1) Korean Fried Chicken (2) Ice Lemon Tea Priced at: \$14.0 Has been added to the Promotions List Successfully. </pre>

4.5 Update Promotional Set

Test Case Description	Expected Outcome
<p>Update Promotional Set called “Korean Fried Chicken Set” price to 13.00</p>	<pre> ===== Welcome to RRPSS ===== (1) Reservation (2) Orders (3) Sales Revenue Report (4) Ala Carte (5) Promotion (6) Payment (7) Exit Please enter your choice : 5 ===== Promotion Menu Options ===== (1) Display Promotion Set (2) Insert Promotion Set (3) Update Promotion Set (4) Delete Promotion Set (5) Return to Main Menu Please enter your choice: 3 Select the Promotion Set you would like to update ===== 1) Claypot Chicken Rice Set 2) Xinghua Vermicelli Set 3) Olive Fried Rice Set 4) Tomato Herby Ramen Set 5) Korean Fried Chicken Set Enter 0 to return to the previous page Please enter your choice: 5 ===== Update Promotion Set Options For Korean Fried Chicken Set ===== 1) Edit Promotion Set Name 2) Edit Promotion Set Items 3) Edit Promotion Set Description 4) Edit Promotion Set Price 5) Back Please enter your choice : 4 Enter the New Promotion Set Price (Original Price: \$14.0) (AlaCarte Combined Price: \$17.0): 13 Promotion Set Price \$14.0 has been changed to \$13.0 </pre>

4.6 Remove Promotional Set

Test Case Description	Expected Outcome
<p>Remove Promotional Set called “Korean Fried Chicken Set”</p>	<pre> ===== Welcome to RRPSS ===== (1) Reservation (2) Orders (3) Sales Revenue Report (4) Ala Carte (5) Promotion (6) Payment (7) Exit Please enter your choice : 5 ===== Promotion Menu Options ===== (1) Display Promotion Set (2) Insert Promotion Set (3) Update Promotion Set (4) Delete Promotion Set (5) Return to Main Menu Please enter your choice: 4 Select the Promotion Set you would like to delete ===== 1) Claypot Chicken Rice Set 2) Xinghua Vermicelli Set 3) Olive Fried Rice Set 4) Tomato Herby Ramen Set 5) Korean Fried Chicken Set Enter 0 to return to the previous page Please enter your choice: 5 ===== Promotion Set Korean Fried Chicken Set Has Been Deleted Successful ===== Promotion Menu Options ===== (1) Display Promotion Set (2) Insert Promotion Set (3) Update Promotion Set (4) Delete Promotion Set (5) Return to Main Menu Please enter your choice: </pre>

4.7 Create Order

Test Case Description	Expected Outcome
<p>Pre-condition: Table must be reserved before hand</p> <p>Create an Order with of “Korean Fried Chicken” for TableNo 4, CustPhoneNo as 88888888, by staffId 50003</p>	<pre> ===== Welcome to RRPSS ===== (1) Reservation (2) Orders (3) Sales Revenue Report (4) Ala Carte (5) Promotion (6) Payment (7) Exit Please enter your choice : 2 ===== Order Options ===== 1) Display Orders 2) Create an Order 3) Update an Order 4) Delete an Order 5) Back Please enter your choice: 2 ===== Create Order ===== Please enter your choice: 1) Table No 9 2) Table No 4 3) Table No 6 4) Table No 5 5) Table No 2 6) Table No 1 7) Table No 8 8) Table No 7 9) Table No 10 10) Table No 9 2 Please enter Staff ID: 50003 Please enter Customer Phone Number: 88888888 ===== RRPSS Menu ===== Ala Carte Items ===== [1] Name: Shan Yao Tofu Description: Fried to golden brown, Course Type: Starters Price: \$14.00 [2] Name: Korean Fried Chicken Description: Super crispy & spicy Course Type: Starters Price: \$14.00 ===== Promotion Sets ===== [8] Name: Claypot Chicken Rice Set Description: asdadas, dsadasdads Promotion Price: \$8.00 Actual Price: \$33.00 Please enter your choice: 2 Please enter Qty: 6 ===== Current items that are added ===== Item Quantity ===== 1) Korean Fried Chicken 6 ===== Please enter 0 to stop adding ===== Please enter your choice: 0 </pre>

4.8 View Order

Test Case Description	Expected Outcome
<p>Pre-condition: Table must be reserved before hand</p> <p>View Order of TableNo 4</p>	<pre> ===== Welcome to RRPSS ===== (1) Reservation (2) Orders (3) Sales Revenue Report (4) Ala Carte (5) Promotion (6) Payment (7) Exit Please enter your choice : 2 ===== Order Options ===== 1) Display Orders 2) Create an Order 3) Update an Order 4) Delete an Order 5) Back Please enter your choice: 1 ===== Display Order ===== 1) Display Current Orders 2) Display Past Orders Enter 0 to return to the previous page 1 ===== Order ID : 1 Time Ordered : 04:10 Date Ordered : 14-11-2021 Payment Completed : false Staff ID : 50003 Table No : 4 ===== Order Item name Quantity Price ===== Korean Fried Chicken 6 \$84.00 Total Price: \$84.00 Enter 0 to return to the previous page </pre>

4.9 Add OrderItem to Order

Test Case Description	Expected Outcome
Add OrderItem called “Shan Yao Tofu” to Order of TableNo 4	<pre> ===== Welcome to RRPSS ===== (1) Reservation (2) Orders (3) Sales Revenue Report (4) Menu (5) Promotion (6) Payment (7) Exit Please enter your choice : 2 ===== Order Options ===== 1) Display Orders 2) Create an Order 3) Update an Order 4) Delete an Order 5) Back Please enter your choice: 3 ===== Select the Order you would like to update ===== (1) Order Id : 1 Customer Name : dilah Table No : 4 Enter 0 to return to the previous page Please enter your choice: 1 ===== Current Order Items ===== Item Quantity ===== Korean Fried Chicken 6 ===== ===== Update Options ===== 1) Add Order Item to Order 2) Remove Order Item from Order Enter 0 to return to the last page ===== Please enter your choice: 1 ===== Select the order item to be added ===== RRPSS Menu ===== Ala Carte Items ===== [1] Name: Shan Yao Tofu Description: Fried to golden brown, t Course Type: Starters Price: \$14.00 ===== [2] Name: Korean Fried Chicken Description: Super crispy & spicy Course Type: Starters Price: \$14.00 ===== Promotion Sets ===== [8] Name: Claypot Chicken Rice Set Description: asdadas, dsadasdads Promotion Price: \$8.00 Actual Price: \$33.00 ===== Current Order Items List ===== Item Quantity ===== 1) Korean Fried Chicken 6 Enter 0 to return to the previous page Enter an option to add: 1 Enter Quantity: 2 Item has been successfully added into the Order ===== Current Order Items ===== Item Quantity ===== Korean Fried Chicken 6 Shan Yao Tofu 2 ===== Update Options ===== 1) Add Order Item to Order 2) Remove Order Item from Order Enter 0 to return to the last page ===== Please enter your choice: 0 ===== </pre>

4.10 Remove OrderItem from Order

Test Case Description	Expected Outcome
Remove OrderItem called “Shan Yao Tofu” from Order of TableNo 4	<pre> ===== Welcome to RRPSS ===== (1) Reservation (2) Orders (3) Sales Revenue Report (4) Ala Carte (5) Promotion (6) Payment (7) Exit Please enter your choice : 2 ===== Order Options ===== 1) Display Orders 2) Create an Order 3) Update an Order 4) Delete an Order 5) Back Please enter your choice: 3 ===== Select the Order you would like to update ===== (1) Order Id : 1 Customer Name : dilah Table No : 4 Enter 0 to return to the previous page Please enter your choice: 1 ===== Current Order Items ===== Item Quantity ===== Korean Fried Chicken 6 Shan Yao Tofu 2 ===== ===== Select the Order item to be removed ===== Item Quantity ===== 1) Korean Fried Chicken 6 2) Shan Yao Tofu 2 Please enter your choice: 2 ===== 1) Remove food item completely 2) Remove a qty Please enter your choice 1 Order Item has been deleted successfully ===== Current Order Items ===== Item Quantity ===== Korean Fried Chicken 6 ===== ===== Update Options ===== 1) Add Order Item to Order 2) Remove Order Item from Order Enter 0 to return to the last page ===== Please enter your choice: 2 ===== </pre>

4.11 Create Reservation Booking

Test Case Description	Expected Outcome
<p>Prerequisites: All tables are VACANT</p> <p>Create a Reservation Booking with the following details:</p> <ul style="list-style-type: none"> - Name: John Doe - phoneNo: 98989898 - #ofPax: 3 - Date: 2021-11-20 - StartTime: 18.00 - TableNo: 20003 - StaffNo: 50001 	<pre> ===== Welcome to RRPSS ===== (1) Reservation (2) Orders (3) Sales Revenue Report (4) Ala Carte (5) Promotion (6) Payment (7) Exit Please enter your choice : 1 ===== Reservations ===== (1) Make Reservation (2) Display Reservation (3) Edit Reservation (4) Delete Reservation (5) Back Please enter your choice: 1 Enter Staff ID: 50001 ===== ===== Make Reservation ===== Enter Customer Contact: (e.g. 81234567) 98989898 Enter Customer Name: John Doe Enter Date of Reservation (yyyy-MM-dd) format: 2021-11-20 Enter Time of Reservation (HH:mm) format: 18:00 Enter Number of Pax: (Max: 10 pax) 3 ===== 98989898 added successfully Table 4 has been assigned successfully ===== </pre>

<p>Prerequisites: All tables are OCCUPIED</p> <p>Create a Reservation Booking with the following details:</p> <ul style="list-style-type: none"> - Name: Carl Doe - phoneNo: 98123432 - #ofPax: 4 -Date: 2021-11-20 - StartTime: 11.00 - TableNo: 20003 - StaffNo: 50001 	<pre> ===== Welcome to RRPSS ===== (1) Reservation (2) Orders (3) Sales Revenue Report (4) Ala Carte (5) Promotion (6) Payment (7) Exit Please enter your choice : 1 ===== Reservations ===== (1) Make Reservation (2) Display Reservation (3) Edit Reservation (4) Delete Reservation (5) Back Please enter your choice: 1 Enter Staff ID: 50001 </pre>	<pre> ===== Make Reservation ===== Enter Customer Contact: (e.g. 81234567) 98123432 Enter Date of Reservation (yyyy-MM-dd) format: 2021-11-20 Enter Time of Reservation (HH:mm) format: 11:00 Enter Number of Pax: (Max: 10 pax) 4 ===== No table found && no reservation has been made ===== </pre>
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4.12 Check Reservation Booking

Test Case Description	Expected Outcome
<p>Check Reservation Booking for Customer "John Doe"</p>	<pre> ===== Welcome to RRPSS ===== (1) Reservation (2) Orders (3) Sales Revenue Report (4) Ala Carte (5) Promotion (6) Payment (7) Exit Please enter your choice : 1 ===== Reservations ===== (1) Make Reservation (2) Display Reservation (3) Edit Reservation (4) Delete Reservation (5) Back Please enter your choice: 2 </pre> <pre> ===== Reservation ===== Enter customer contact to retrieve details: ===== 98989898 ===== ResId: 30011 Customer [20014] Name: John Doe No. of Pax: 3 Contact No: 98989898 Reservation Date: 20-11-2021 Reservation Time: 18:00 HR Order Taken by Staff: [50001: marcus] Allocated: [Table 4] Reservation will be auto-cancelled at 18:10 HR ===== </pre>

4.13 Remove Reservation Booking

Test Case Description	Expected Outcome
<p>Remove Reservation Booking for Customer "John Doe"</p>	<pre> ===== Welcome to RRPSS ===== (1) Reservation (2) Orders (3) Sales Revenue Report (4) Ala Carte (5) Promotion (6) Payment (7) Exit Please enter your choice : 1 ===== Reservations ===== (1) Make Reservation (2) Display Reservation (3) Edit Reservation (4) Delete Reservation (5) Back Please enter your choice: 4 </pre> <pre> ===== Enter customer contact to remove his/her appointment: ===== 98989898 ===== John Doe 's reservation with contact number 98989898 has been remove successfully ===== </pre>

4.14 Print Order Invoice

Test Case Description	Expected Outcome
Non-member	<pre> ===== Welcome to RRPSS ===== (1) Reservation (2) Orders (3) Sales Revenue Report (4) Ala Carte (5) Promotion (6) Payment (7) Exit Please enter your choice : 6 1) Table No 6 2) Table No 10 ===== Generating Invoice ===== Please enter your choice: 2 Would you like to be member? (Y/N) n ===== Invoice ===== Table No : 10 Customer Name : James Staff ID : 50001 ===== Order Items ===== Order Item name Quantity Price ===== Shan Yao Toufu 3 \$42.00 Roast Duck 2 \$30.00 Korean Fried Chicken 8 \$112.00 ----- Sub Total Price : \$184.00 GST : \$12.88 Service Charge: \$18.40 Total Price: \$215.28 ----- </pre>
Member	<pre> ===== Welcome to RRPSS ===== (1) Reservation (2) Orders (3) Sales Revenue Report (4) Ala Carte (5) Promotion (6) Payment (7) Exit Please enter your choice : 6 1) Table No 4 ===== Generating Invoice ===== Please enter your choice: 1 Choice does not exist, please enter a valid choice: Would you like to be member? (Y/N) Y ===== Invoice ===== Table No : 4 Customer Name : dilah Staff ID : 50003 ===== Order Items ===== Order Item name Quantity Price ===== Korean Fried Chicken Set 6 \$78.00 ----- Sub Total Price : \$78.00 GST : \$5.46 Service Charge: \$7.80 Total Price: \$91.26 ----- Discount : \$13.69 ----- Discounted Total Price : \$77.57 ----- </pre>

4.15 Print Monthly Sales Revenue Report

Test Case Description	Expected Outcome
Print Monthly Sales Revenue Report for the month of November	<pre> ===== Monthly Revenue Report ===== Guide: January = 1 ... December = 12 Which month's revenue report would you like to print? Enter 0 to return to the Main Menu Enter Month: 11 ----- REVENUE REPORT FOR NOVEMBER ----- Item Total Qty Total Price ----- Shan Yao Toufu 3 \$42.00 Roast Duck 2 \$30.00 Korean Fried Chicken 8 \$112.00 ----- Total Revenue: SGD 215.28 ----- Enter 0 to return to the Main Menu </pre>