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CSCI 4448

Massimo: Final Report

1. What features were implemented?
    - Requirements:
        i. Rate specific meals
        ii. Create a receipt of items a user ordered in a sitting and Display it in payment screen
        iii. Highlight items that the user clicks on and pop a pay for button
        iv. Move user to rating screen after payment
        v. Calculate tip and display 10%, 15%, and other then add selected to selected bill
        vi. Have a button on home screen to bring up camera to scan QR code
        vii. Easily spit check between other users
        viii. As restaurant places order, create and update the table's receipt
        ix. Use QR Codes to determine which check is associated with the user
        x. Tag entrée based on the type of food they have
        xi. Once user scans QR code for table associate them with receipt
        xii. If more than two users scan the QR code for one sitting, enable them to select which items to pay for.
        xiii. Selecting specific items to pay for, instantly updates on all user's phones
        xiv. Have app suggest meals for me based on what I have previously had
    - Use Cases:
        i. UC-003 (partial)
            1. Rate Experience
        ii. UC-005
            1. Search by Item
        iii. UC-006
            1. Check in to Table
        iv. UC-007
            1. Update Order
        v. UC-008
            1. Checkout of Restaurant

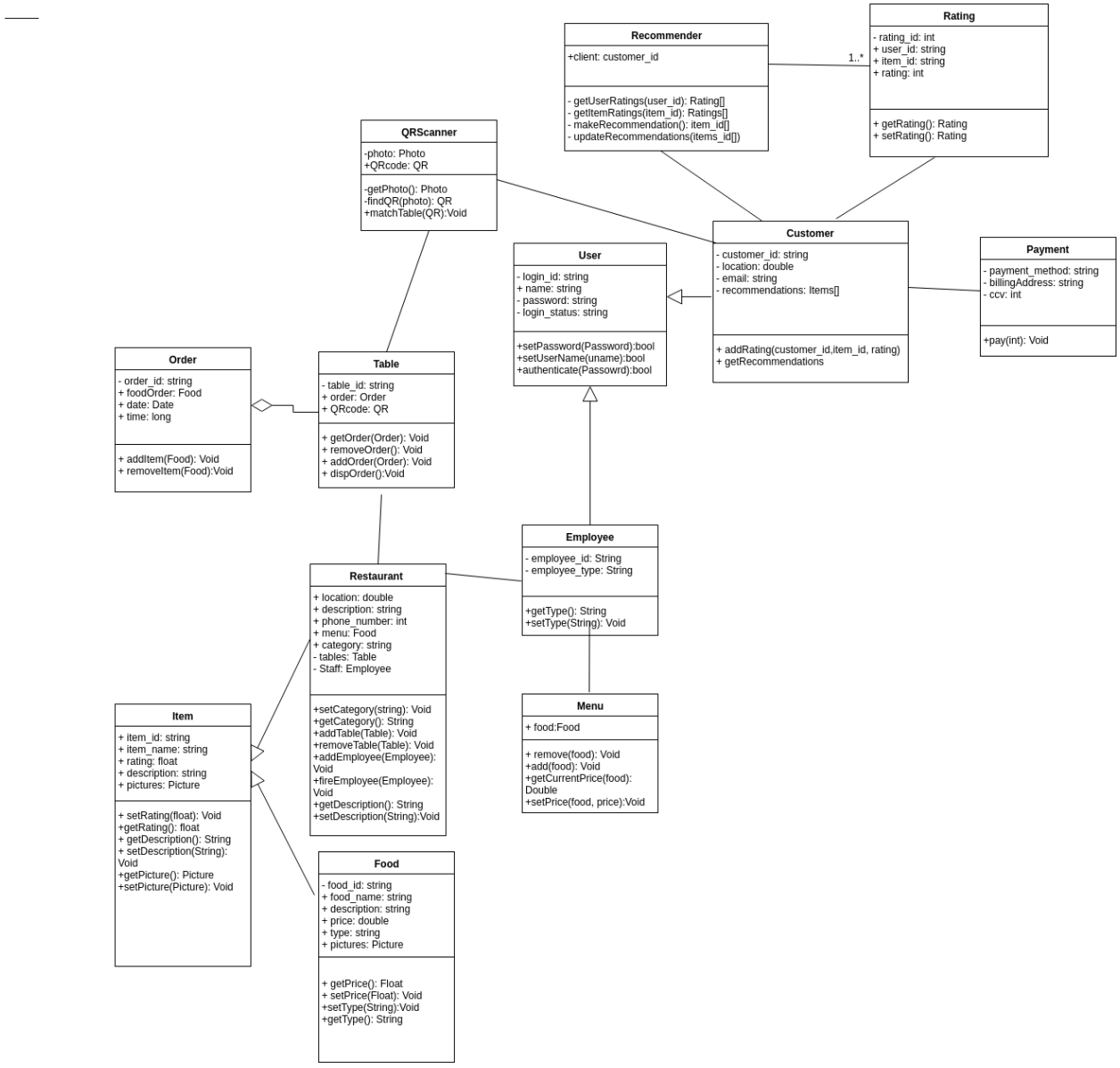
2. Which features were not implemented from Part 2?

- Requirements
    i. Sign in through Facebook
    ii. Sign in through Google+
    iii. Use preferred payment method
    iv. Search through nearby entrees based on meal type
    v. Rate the restaurant
    vi. See what dishes are trending near me
    vii. Keep me logged in
    viii. Automatically charges users that forget to pay
    ix. Able to upload new entrée to app
    x. View statistical data about restaurant's entrees
    xi. Show total tips earned for the day so splitting between servers can be calculated
    xii. Know if an entrée is available at restaurant.
    xiii. Auto detect accounts that user is already signed into
    xiv. USE GPS to determine if a user is at a restaurant
    xv. Auto pay for forgotten tabs at midnight
    xvi. Store the frequency at which specific entrée is ordered
    xvii. Display which entrees are trending based on frequency of it ordered
    xviii. Store the average user rating for each entrée
    xix. Enable search that can be organized by distance, name or rating
    xx. Store pictures for entrees
    xxi. Display entrees' photos on search list
    xxii. Create a homepage with a list of entrees based on location and rating
    xxiii. Send notification to user when they enter a restaurant that support our app
    xxiv. Update user that payment is complete after transaction goes through. Or tell them that it failed
    xxv. Restaurant can view a list of entries available at their restaurant and select and update which items are out of stock.
    xxvi. Signing in with other accounts takes no longer than 10 seconds
    xxvii. Protecting sensitive user data including username, password and location
    xxviii. Search functionality should be quicker than 30 seconds
- Use Cases
    i. UC-001
        1. Log in to app (customer)
    ii. UC-002
        1. Log in to app (Employee)
    iii. UC- 004
        1. Search by Restaurant
    iv. UC-009
        1. Update Restaurant information

v. UC-010
    1. Update Restaurant Menu
vi. UC-011
    1. Modify Account Info

3. Show your Part 2 class diagram and your final class diagram. What changed? Why? If it did not change much, then discuss how doing the design up front helped in the development.

Class Diagram from Part 2:



Final Class Diagram:

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The main changes that occurred between the class diagram from part 2 and the final class diagram are the classes and the connections that deal with the order system and the recommender system.

In terms of the order system, things were changed to enable a dynamic experience. We accomplished this by integrating the observer design pattern and the model-view controller. Originally the payment system consisted of Order, Table, QRScanner, Customer, and Payment class and their corresponding connections. Rather than using that model we opted for creating an observable class (TableModel) and a observer class (OrderController). This enables us to have the TableModel get updates which then passes the updates to OrderController, which then updates the view accordingly. Which then leads to OrderController. OrderController acts as the controller for the views for the QR scanner (CameraView), the order screen (OrderView) and pay screen (PayView) and the models for orders (OrderModel) and food (FoodModel) classes. It controls the data flow into models and updates the views whenever updates come in. It keeps view and model separate.

The main change to the recommendation system was that we moved the methods of the Recommender class to the Rating class, and made them static. The Recommender class exhibited symptoms of a poltergeist anti-pattern, since it was temporarily created to invoke methods on the Rating class. Delegating these methods to the Rating class make the system more cohesive since all rating related variables and methods are together, while reducing coupling by removing the transient class.

4. Did you make use of any design patterns in the implementation of your final prototype? If so, how? If not, where could you make use of design patterns in your system?
    - MVC - OrderController acts as the controller for the views for the QR scanner (CameraView), the order screen (OrderView) and pay screen (PayView) and the models for orders (OrderModel) and food (FoodModel) classes. It controls the data flow into models and updates the views whenever updates come in. It keeps view and model separate.
    - Observer- created an observable class (TableModel) and a observer class (OrderController). This enables us to have the TableModel get updates which then passes the updates to OrderController, which then updates the view accordingly.
    - Singleton- A variation of Singleton was used implemented in customer class.

- Adapter- We used a listview adapter for rating and rateable.
- State- Was used in the transition from screen to screen in the fragment classes.

5. What have you learned about the process of analysis and design now that you have stepped through the process to create, design and implement a system?

Planning through UML diagrams makes implementation a lot easier especially for complicated systems especially class diagrams. We realized that pre designing really helps speed up the implementation process because it eliminates time usually spent on debugging poorly designed code. Also there are many ways to code smartly and efficiently.

Another thing that we learned is the importance of design patterns. Without the knowledge of some of the design patterns like the observer design pattern, we would not have been able to accomplish some of the objectives that we put forth. Therefore, it is worth learning the design patterns, and asking yourself how to incorporate them into your code to improve the design of your system.