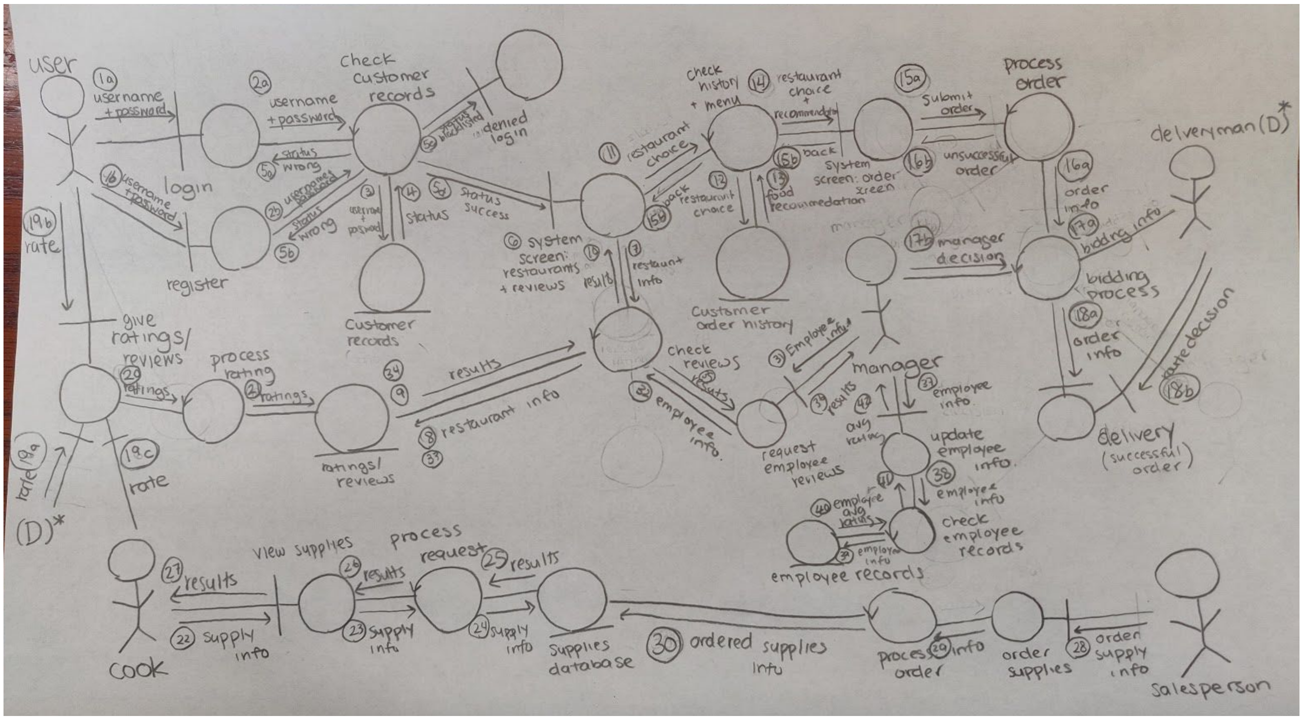
1. General Collaboration Class Diagram



2. All use cases: Scenarios for each use case: normal AND exceptional scenarios

1. Access customer info
    a. Registered and VIP Customers can view and update only their own info and no other customers' info
        i. If customer is not registered nor VIP, they will not be able to view nor update their info, since they haven't created an account. Instead, they will be given the option to create an account.
        ii. Customers will be able to update any information about them except their name
    b. Managers can only update a customer's blacklist and average rating
        i. Managers will not be given the option to update any other information about the customers that they can view
    c. Delivery People can only view the customer's name, address, and phone number
        i. Delivery people will not be given the ability to see other information about a customer
2. Order
    a. Visitor, registered, and VIP customers can choose and order food
        i. Customers who try to order from a particular restaurant, but are blacklisted from that restaurant, will not be allowed to order food from that restaurant.
    b. Managers can view the customers' order and either approve it
        i. If the order is from a blacklisted customer, the manager only has the option to deny the order
        ii. If the order cannot be made due to supply levels, no matter who the customer is, the manager has the ability to deny the order
    c. Delivery People can view any customers' order to see who to deliver to
        i. However, delivery people cannot deliver to blacklisted customers
    d. Cooks can view customers' orders to prepare meal
        i. If customer order is from blacklisted customer, cooks don't have to prepare that customer's meal
3. Cancel Order
    a. Customers can cancel order if actual delivery time exceeds estimated delivery time and if food delivered was not what was ordered by customer
        i. If 10 minutes have passed since making an order, the customer cannot cancel that order
    b. Managers can view cancelled orders
        i. Managers cannot get paid themselves nor pay delivery people for cancelled orders
    c. Cooks can view cancelled orders
        i. Cooks cannot reuse cancelled order for another order

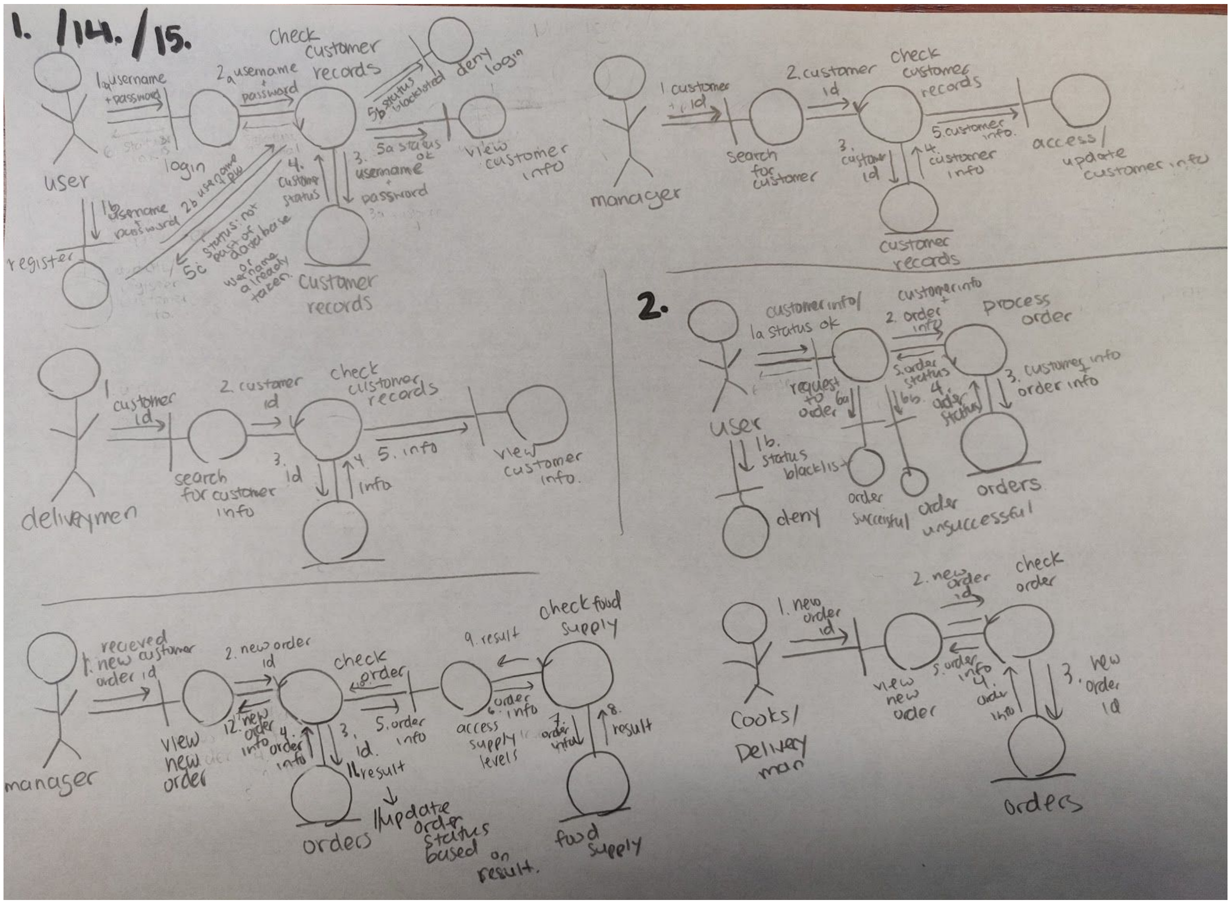
4. Ratings
    a. Customers can rate the quality of restaurant (food and delivery service) by rating out of five stars, they can view ratings from other customers, and the rating given to them by delivery people
        i. Customers cannot alter ratings that they themselves did not create
        ii. After receiving rating from delivery person, customer will not be able to alter rating they gave to the restaurant
        iii. All types of customers can rate except visitors, who can only read ratings and not rate anyone. There will be no option for them to give ratings.
    b. Delivery people can only rate customers that they deliver to, they can see the delivery ratings given to them by customers
        i. If delivery people try to give or alter ratings to customer after receiving rating from customer, they will not be able to
    c. Cooks can rate the supplies that salespeople have ordered and view the ratings on the food they have prepared
        i. If cooks try to alter any ratings given to them, they will not be able to
    d. Salespeople can only view ratings from cooks on the supplies they have bought
        i. If salespeople try to alter ratings given to them, they will not be able to
        ii. If salespeople try to rate other types of users, they will not be able to
5. Bid
    a. Managers can view bids so that they can pick the lowest one
        i. If managers try to pick more than one bid, they will receive a prompt saying what is being attempted is not allowed
        ii. If managers try to pick a bid that's not the lowest, they will receive a prompt saying that the wrong bid is being picked
6. Access Employee Information
    a. Managers can view an employee's basic information, total hours, hourly wage, current salary, commission percentage for all employees (salespeople, cooks, delivery people)
        i. Managers can alter everything above except basic information. If they try to, they will not be able to
    b. Delivery people can view only their own basic information, total hours, hourly wage, and current salary. Delivery people can alter their basic info.
        i. If delivery people try to alter information other than their basic info, they will not be able to
    c. Cooks can view only their own basic information, total hours, hourly wage, and current salary. Delivery people can alter their basic info.
        i. If delivery people try to alter information other than their basic info, they will not be able to
    d. Salespeople can view only their own basic information, total hours, hourly wage, and current salary. Delivery people can alter their basic info.
        i. If salespeople try to alter information other than their basic info, they will not be able to

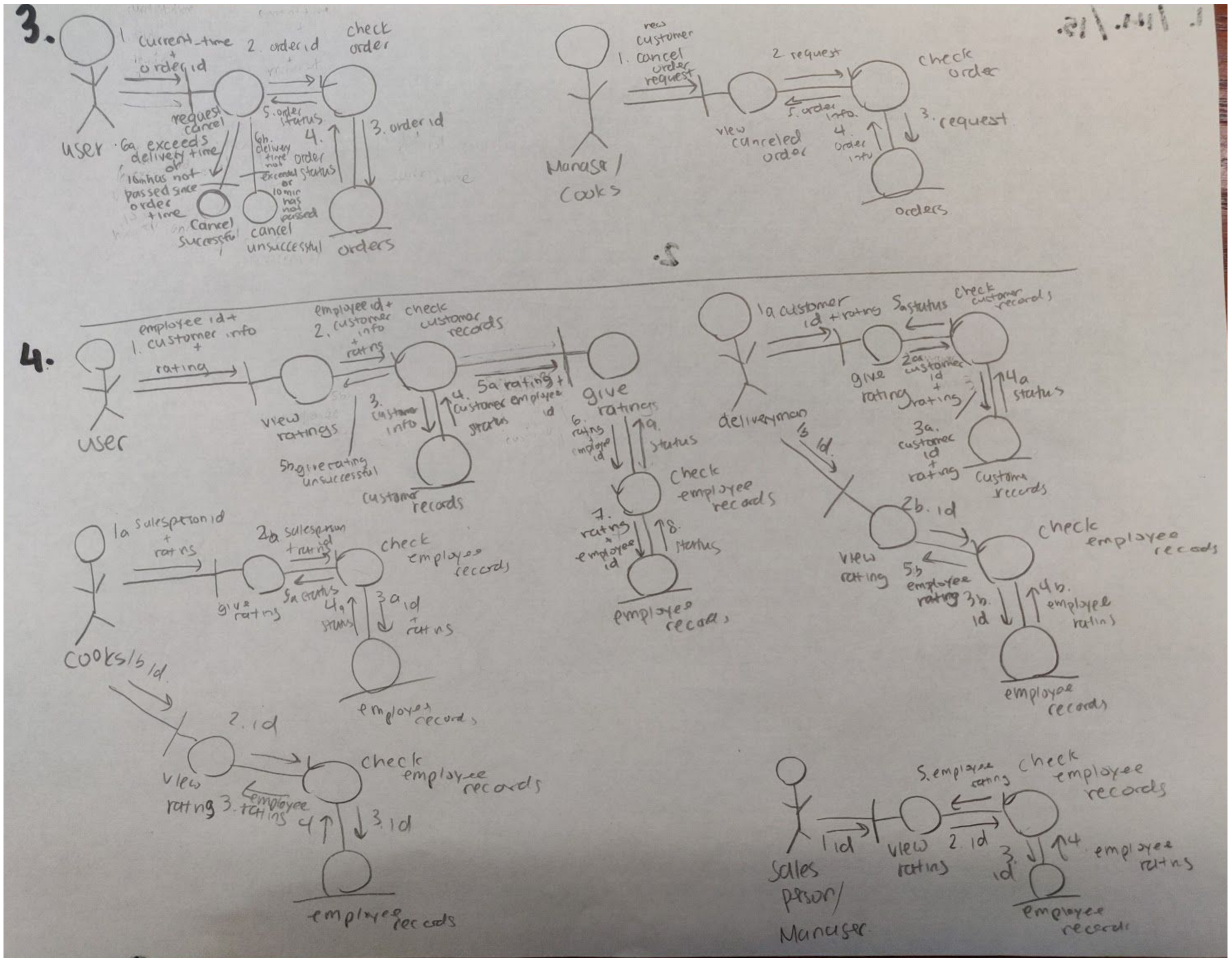
7. Decide Route
    a. Delivery people can choose a route suited for quicker delivery and better service
8. Set Menu
    a. Cooks can alter menu based on supplies and customer ratings
        i. Cooks must remove an item off of the menu if the average rating is less than 2 in the last 3 orders of that menu item. If they don't, it will be taken off automatically
9. Buy Supply
    a. Salespeople can buy supplies, they can start a new business with a new supplier or discontinue business with a current supplier
10. Add Blacklist
    a. Managers will be given the option to blacklist customers if the customer's rating is less than or equal to 1. Once managers decide to blacklist customer, they are given warning that what they are about to do cannot be undone
        i. If managers try to blacklist customer with a rating that is not less than or equal to 1, system will not allow this to happen
11. Give Warning
    a. Managers can issue a warning to a cook whose food item was dropped off the menu twice, to a delivery person who has average rating of less than 2 in the last 3 deliveries, and to salesperson that received a complaint about a supply from the cooks more than 3 times. For all these cases, the manager will be given a reminder by the system to administer these warnings. Managers can also erase a warning
        i. If managers try to issue a warning to a cook for reasons not listed above, they will not be able to
12. Give Raise/Reduce
    a. Managers can raise an employee's salary who consistently receives good ratings (system will give reminder to manager)
        i. Managers can reduce employee's salary who consistently receives bad ratings (system will give reminder to manager)
        ii. If salesperson receives a warning, manager will get reminder to reduce a salesperson's commission by 10%
        iii. Managers can raise a salesperson's salary by 10% when they receive 3 straight 5 ratings (system will give reminder to manager)
13. Hire/Fire
    a. Managers can hire and fire employees. If delivery person has more than 3 warnings, managers will get reminder by the system to fire. If cook has more than 3 warnings, managers will get reminder by the system to fire. If salesperson has more than 3 warnings, managers will get reminder by the system to fire.
        i. If managers try to fire employees that have 3 warnings or less, the system will prompt the manager, asking if the manager really wants to go on with this, because the employee hasn't met the criteria to get fired
14. Login

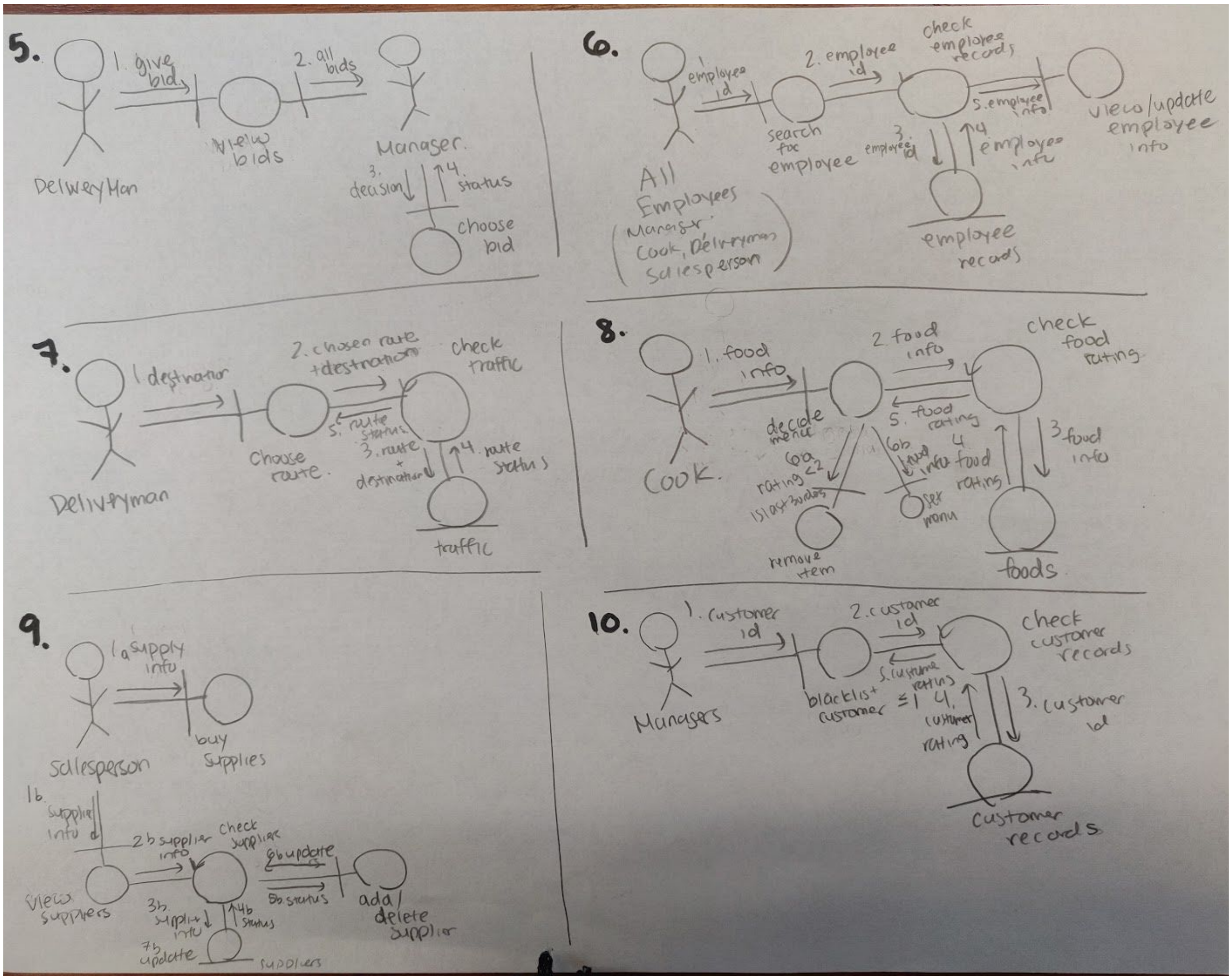
    a. User will enter username and password and if successful, will be able to use features of the app
        i. If username or password does not match what is in the database, user will not be able to enter the app. User can try as many times as he or she likes. There will be a forgot username/password option.
        ii. If user uses the forgot username/password option, then the user will have to enter the email address he or she registered with. If user has email with the app, user will get email with a new password.

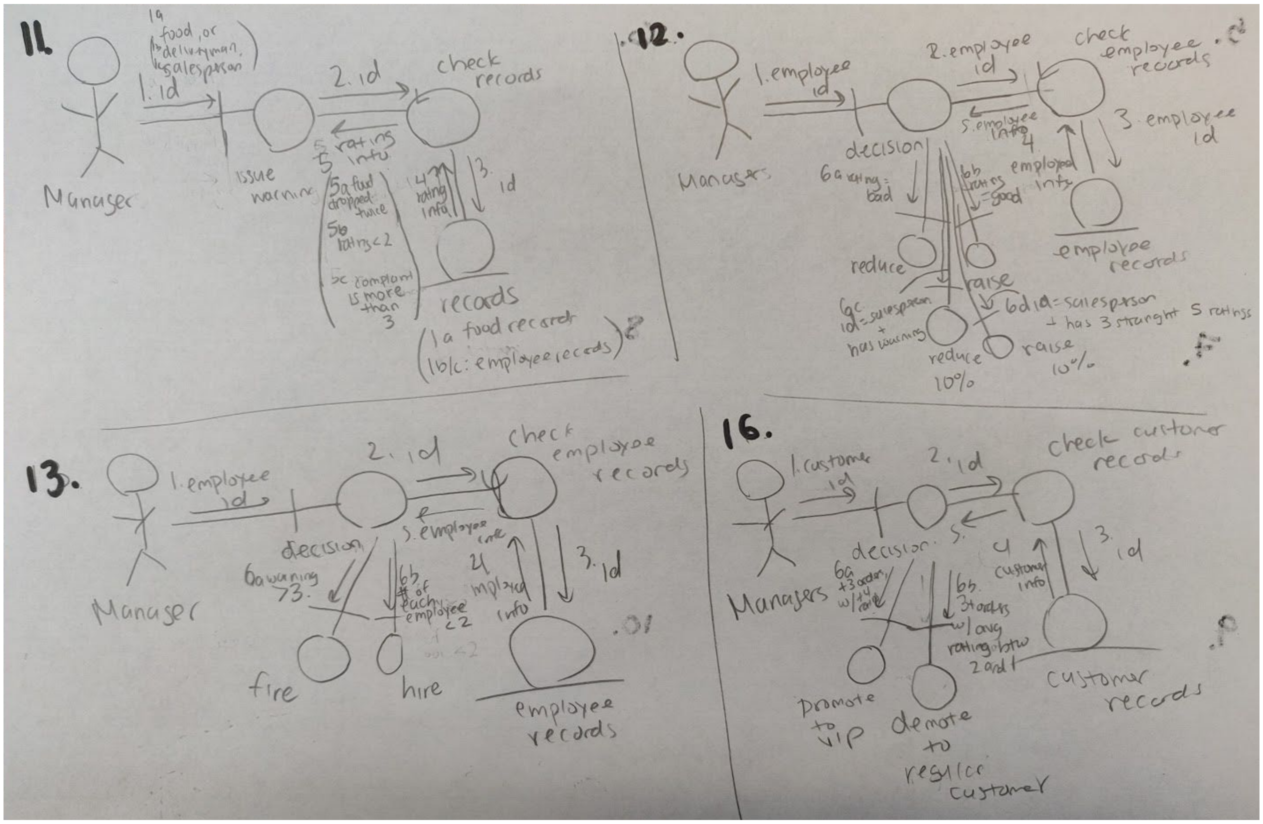
15. Register
    a. User can click on “Register” and enter Name, Address, Phone Number, username, and password.
        i. If username is taken, then user will have to try another username, and will not be able to register until that part is completed
        ii. If password is not at least 8 characters, then user will have to try another password, and will not be able to register until that part is completed
        iii. If phone number is not a phone number, then user will be prompted to enter a phone number, and will not be able to register until that part is completed
        iv. If a part of address is missing, user will be prompted to not leave it empty, and will not be able to register until that part is completed
16. Demotion/Promotion of Users
    a. Managers can promote customer to VIP if customer made more than 3 orders with an average rating of 4 and above (manager will get reminder by system)
        i. If manager tries to promote customer to VIP who doesn’t meet the above criteria, system will ask the manager if manager wants to do this
    b. Managers can demote customer to visitor if they made more than 3 orders with an average rating between 2 and 1
        i. If manager tries to demote customer to visitor who doesn’t meet above criteria, system will ask manager if manager wants to do this
    c. Manager can promote visitor to registered customer

Collaboration Class Diagrams For Each Use Case:



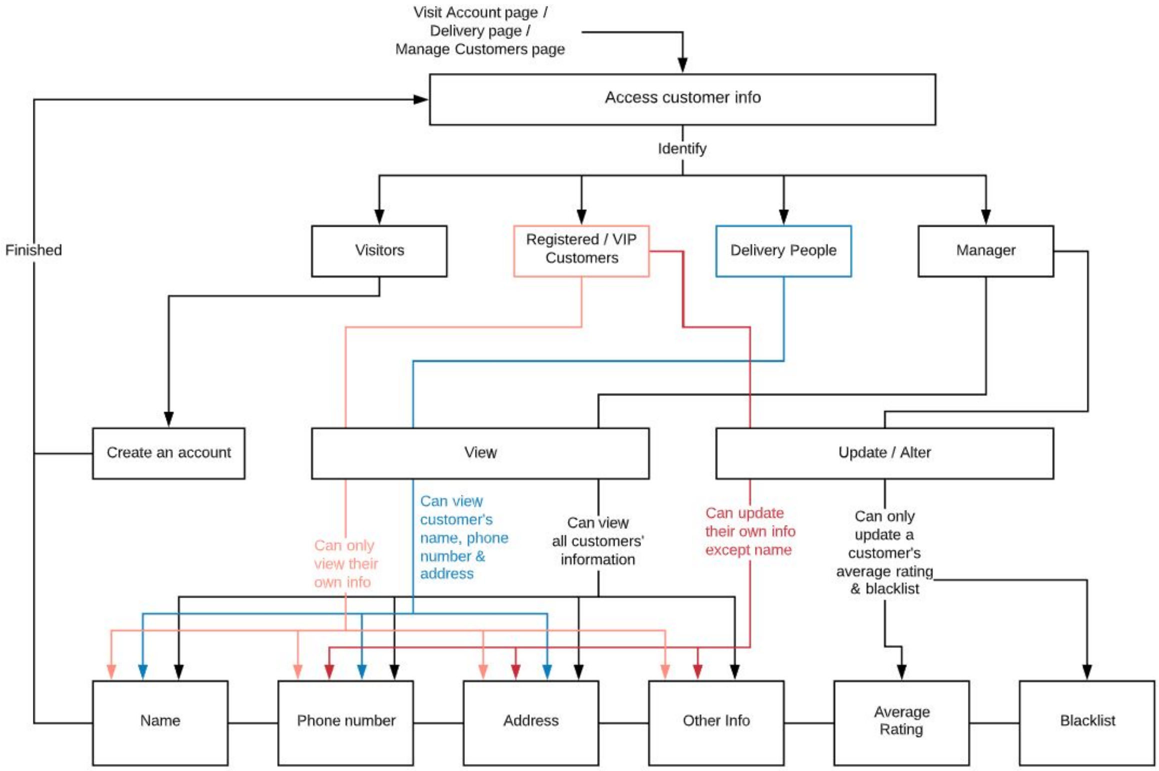

3.
user
1. current_time + order id
request cancel
2. order id
check order
5. order status
4. order status
3. order id
6a. exceeds delivery time or 10min has not passed since order time
6b. delivery time not exceeded or 10min has not passed
Cancel successful
cancel unsuccessful
orders
Manager / Cooks
1. cancel order request
2. request
check order
5. order info
view canceled order
3. request
4. order info
orders
4.
user
1. employee id + customer info + rating
view ratings
2. employee id + customer info + ratings
check customer records
3. customer info
4. customer employee status
5a rating + customer employee id
5b. give rating unsuccessful
customer records
give ratings
6. rating + employee id
9. status
check employee records
7. rating + employee id
8. status
employee records
deliveryman
1a customer id + rating
give rating
2a customer id + rating
5a status
check customer records
3a. customer id + rating
4a status
Customer records
1b id
view rating
2b. id
check employee records
5b employee rating
3b. id
4b. employee ratings
employee records
cooks
1a salesperson id + ratings
give ratings
2a salesperson id + rating
5a status
check employee records
3a id + ratings
4a status
employee records
1b id
view rating
2. id
check employee records
3. employee ratings
3. id
4
employee records
sales person / Manager
1. id
view ratings
2. id
check employee records
5. employee rating
3. id
4. employee ratings
employee records

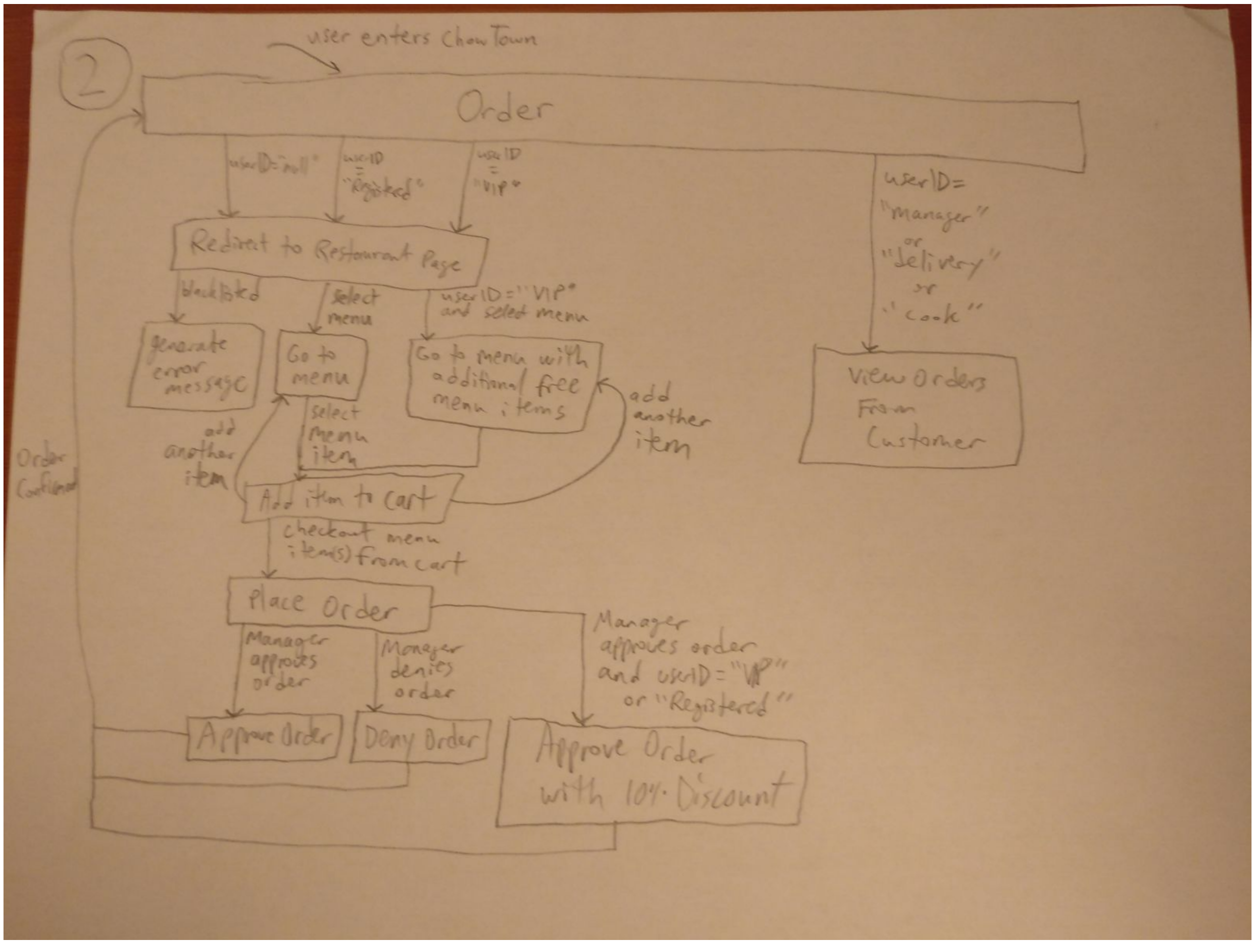

5.
1. give bid
2. all bids
view bids
Manager.
DelweryMan
3. decision
4. status
choose bid
6.
1. employee id
2. employee id
check employee records
5. employee info
view/update employee info
search for employee
3. employee id
4 employee info
All Employees (Manager, Cook, Deliveryman, Salesperson)
employee records
7.
1. destination
2. chosen route +destinations
check traffic
5. route status
3. route + destination
4. route status
Choose route.
Deliveryman
traffic
8.
1. food info
2. food info
check food rating
5. food rating
decide menu
6a rating <2 is last 3 orders
6b food info
4 food rating
3 food info
set menu
Cook.
remove item
foods
9.
1a supply info
buy supplies
Salesperson
1b. supplier info
2b supplier info
check suppliers
6b update
5b status
add/delete supplier
view suppliers
3b. supplier info
4b status
7b update
suppliers
10.
1. customer id
2. customer id
check customer records
5. customer rating ≤1
4. customer rating
3. customer id
Managers
blacklist customer
customer records


11.
Manager
1. id
1a food, or
1b deliveryman,
1c salesperson
issue warning
2. id
check records
5 ratings info
5a food dropped twice
5b ratings<2
5c complaint is more than 3
4 rating info
3. id
records
(1a food records
1b/c: employee records)
12.
Managers
1. employee id
decision
2. employee id
check employee records
5. employee info
4 employee info
3. employee id
employee records
6a rating = bad
6b ratings = good
reduce
raise
6c id = salesperson + has warning
reduce 10%
6d id = salesperson + has 3 straight 5 ratings
raise 10%
13.
Manager
1. employee id
decision
2. id
check employee records
5. employee info
4 employee info
3. id
employee records
6a warning >3.
6b # of each employee <2
fire
hire
16.
Managers
1. customer id
decision
2. id
check customer records
5.
4 customer info
3. id
customer records
6a +3 orders w/ +4 rating
6b. 3+ orders w/ avg rating btw 2 and 1
promote to vip
demote to regular customer

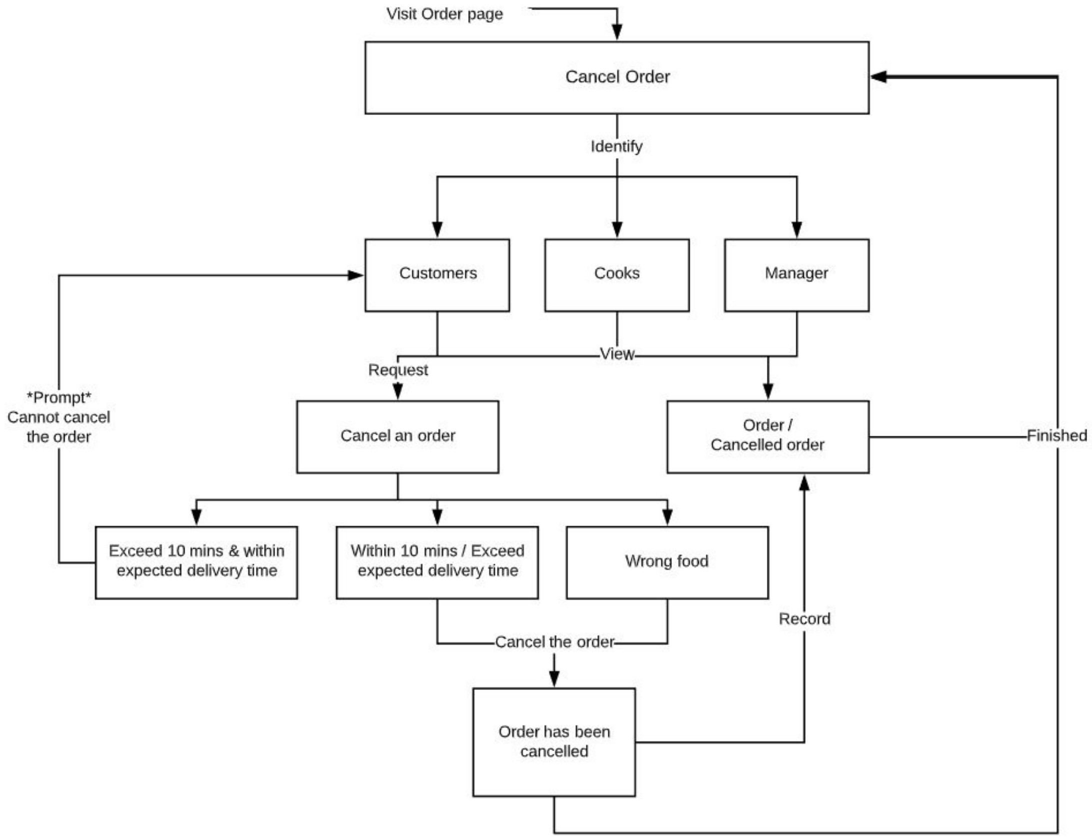
State Diagrams for each Use Case:

1. Access Customer Info

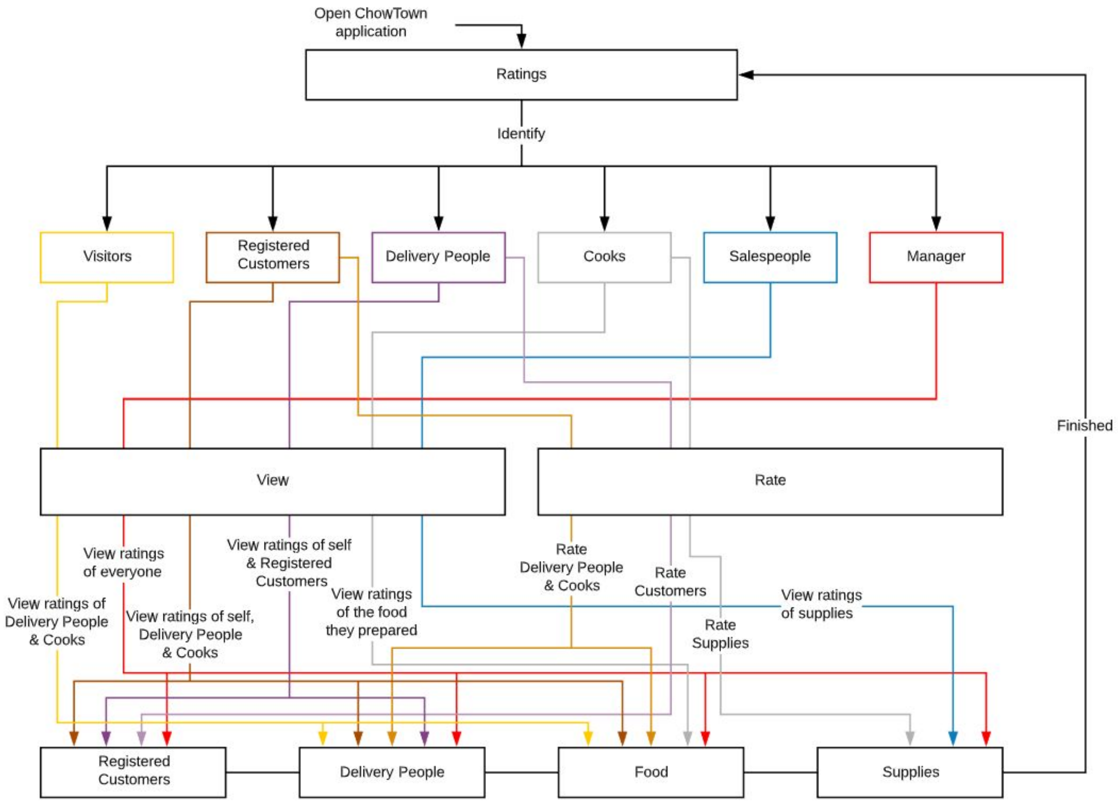

Visit Account page / Delivery page / Manage Customers page
Access customer info
Identify
Finished
Visitors
Registered / VIP Customers
Delivery People
Manager
Create an account
View
Update / Alter
Can only view their own info
Can view customer's name, phone number & address
Can view all customers' information
Can update their own info except name
Can only update a customer's average rating & blacklist
Name
Phone number
Address
Other Info
Average Rating
Blacklist

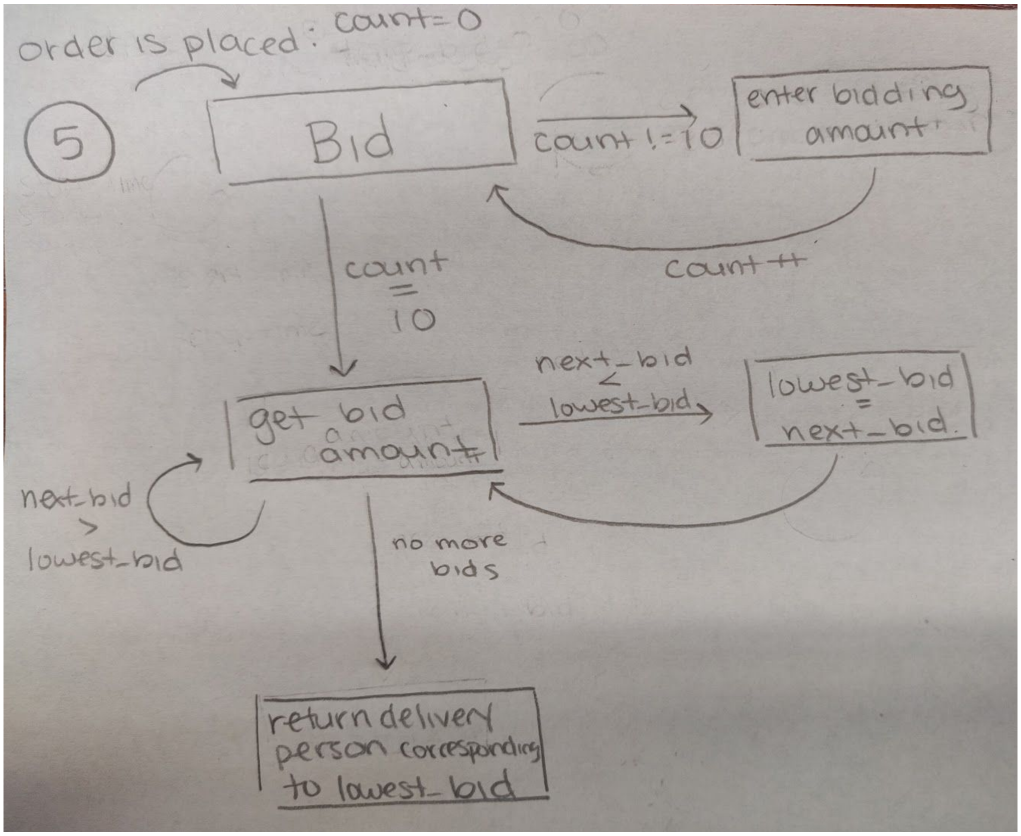

2
user enters ChowTown
Order
userID="null"
userID = "Registered"
userID = "VIP"
userID= "manager" or "delivery" or "cook"
Redirect to Restaurant Page
blacklisted
select menu
userID="VIP" and select menu
generate error message
Go to menu
Go to menu with additional free menu items
View Orders From Customer
add another item
select menu item
add another item
Order Confirmed
Add item to cart
checkout menu item(s) from cart
Place Order
Manager approves order
Manager denies order
Manager approves order and userID="VIP" or "Registered"
Approve Order
Deny Order
Approve Order with 10% Discount

3. Cancel Order

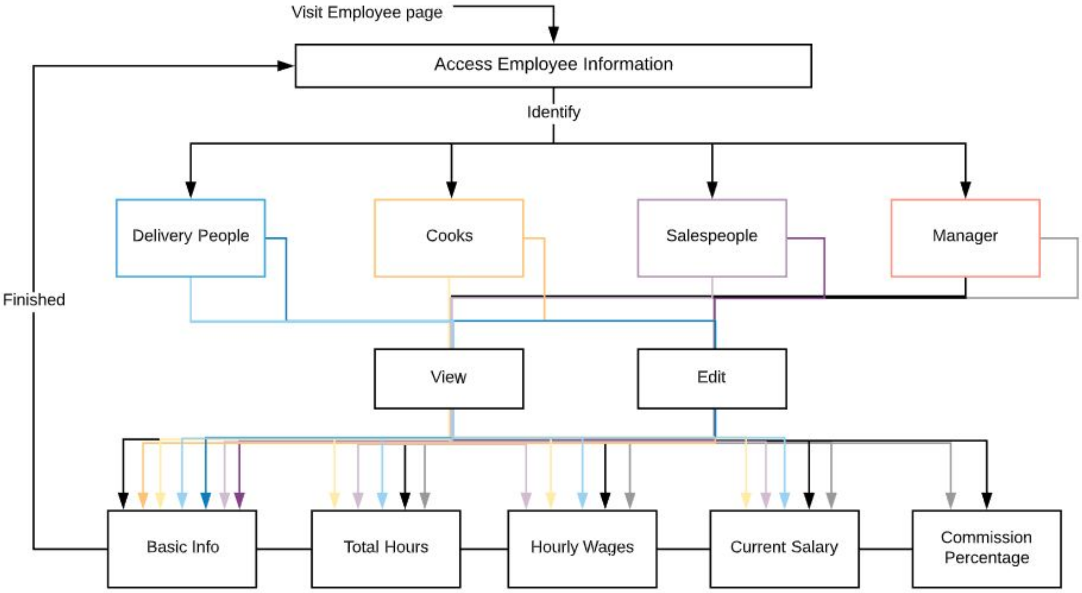


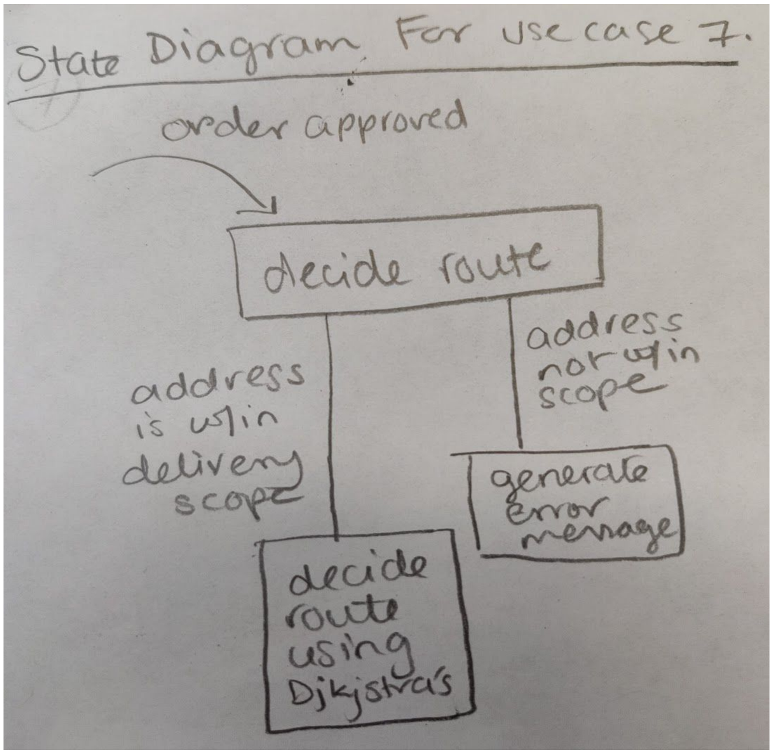
4. Ratings

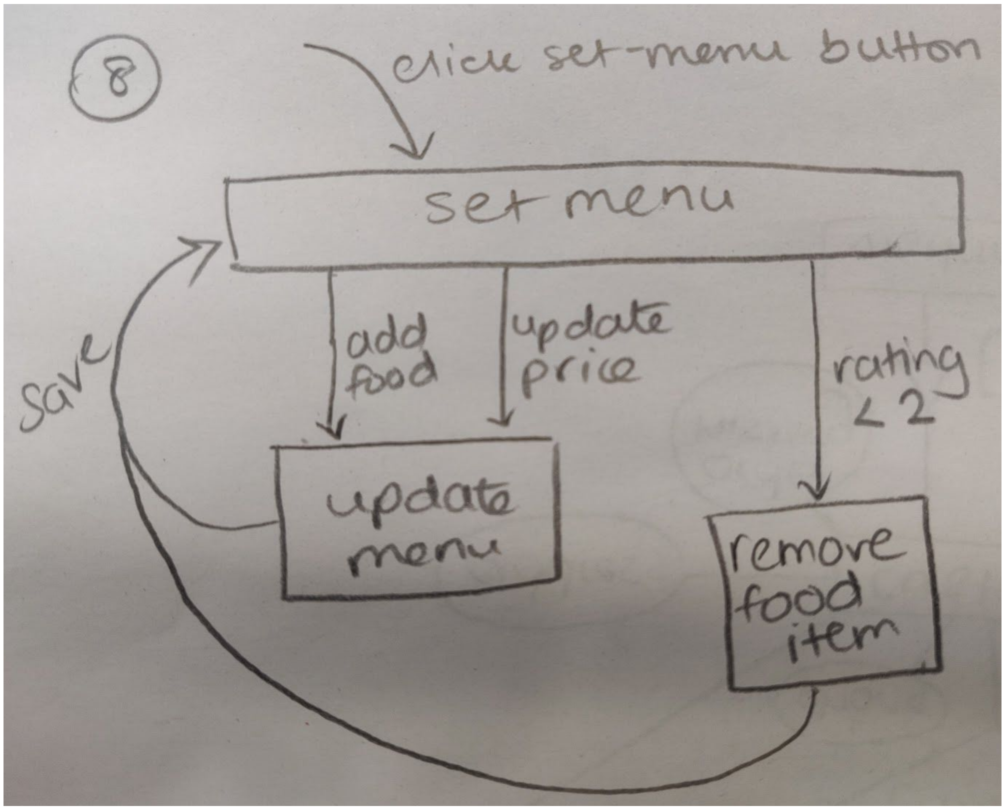

Open ChowTown application
Ratings
Identify
Visitors
Registered Customers
Delivery People
Cooks
Salespeople
Manager
Finished
View
Rate
View ratings of everyone
View ratings of self & Registered Customers
View ratings of Delivery People & Cooks
View ratings of self, Delivery People & Cooks
View ratings of the food they prepared
Rate Delivery People & Cooks
Rate Customers
Rate Supplies
View ratings of supplies
Registered Customers
Delivery People
Food
Supplies



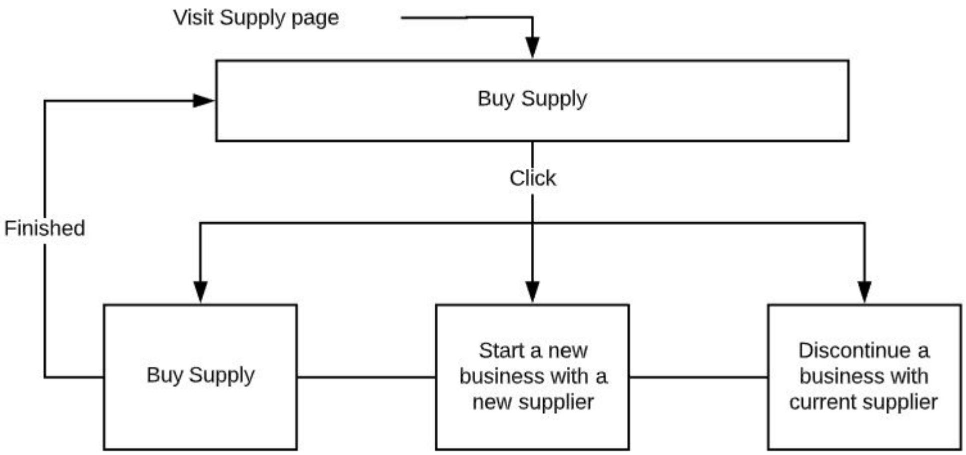
6. Access Employee Information



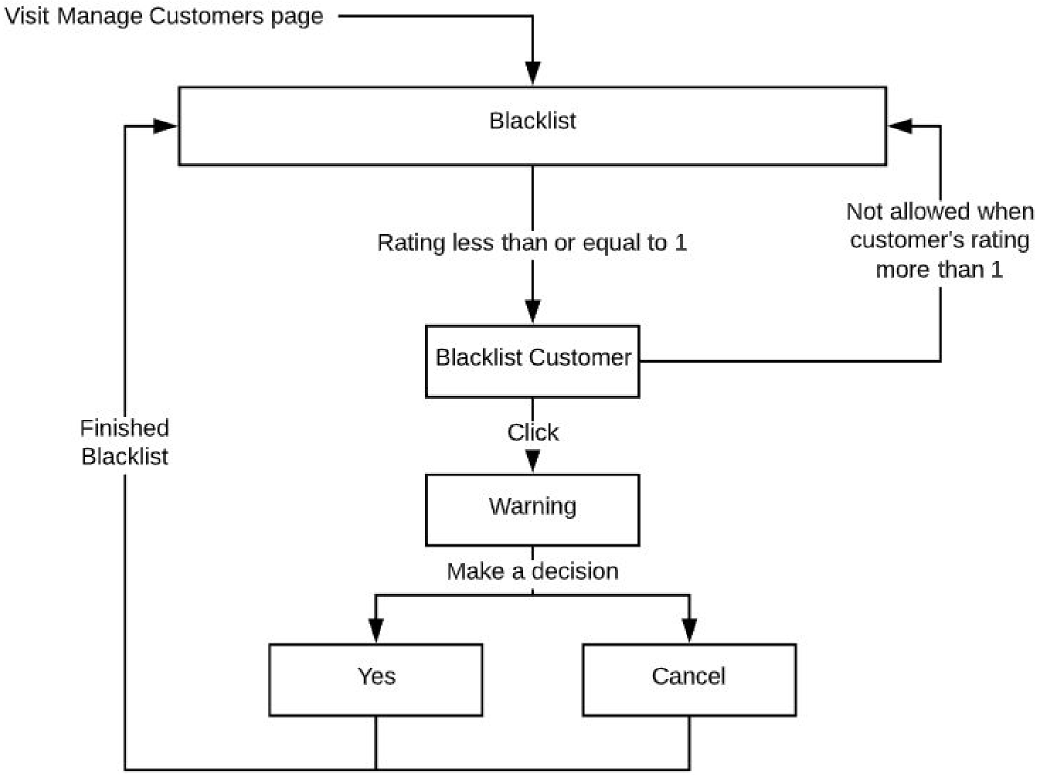

State Diagram For use case 7.
order approved
decide route
address is w/in delivery scope
address not w/in scope
generate error message
decide route using Djkjstra's


8
click set-menu button
set menu
add food
update price
rating < 2
save
update menu
remove food item

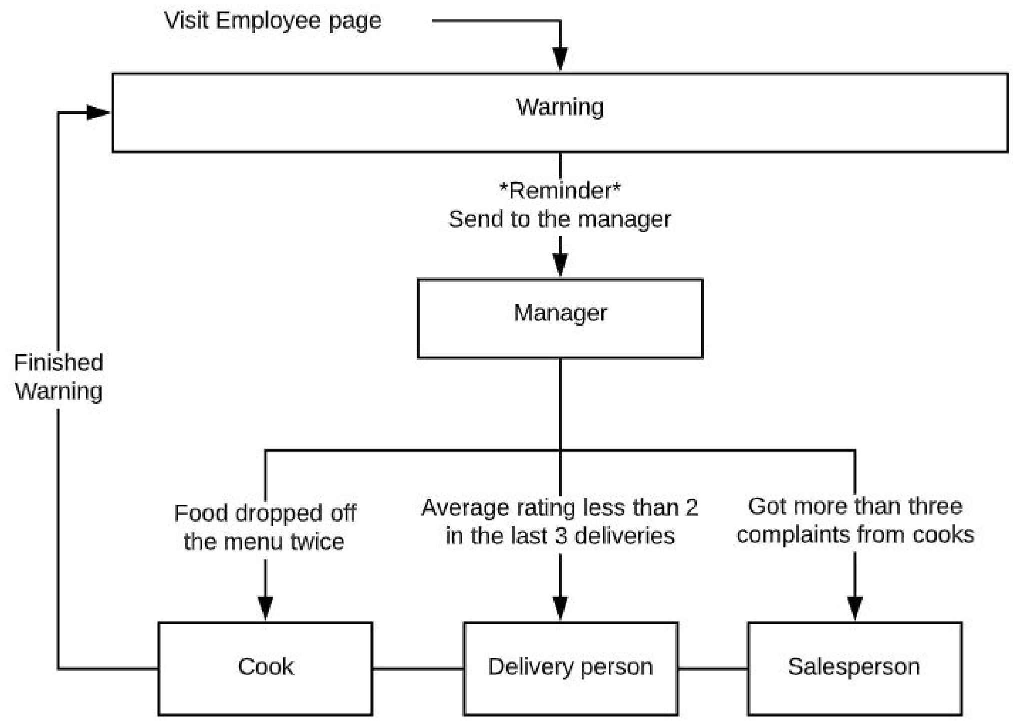
9. Buy Supply


Visit Supply page
Buy Supply
Click
Finished
Buy Supply
Start a new business with a new supplier
Discontinue a business with current supplier

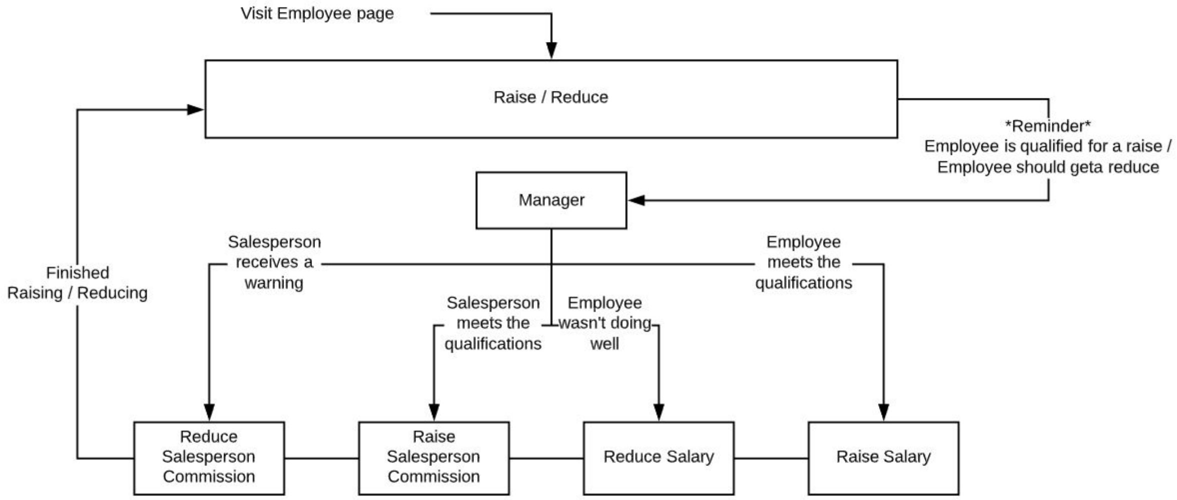
10. Add Blacklist


Visit Manage Customers page
Blacklist
Rating less than or equal to 1
Not allowed when customer's rating more than 1
Blacklist Customer
Click
Warning
Make a decision
Yes
Cancel
Finished Blacklist

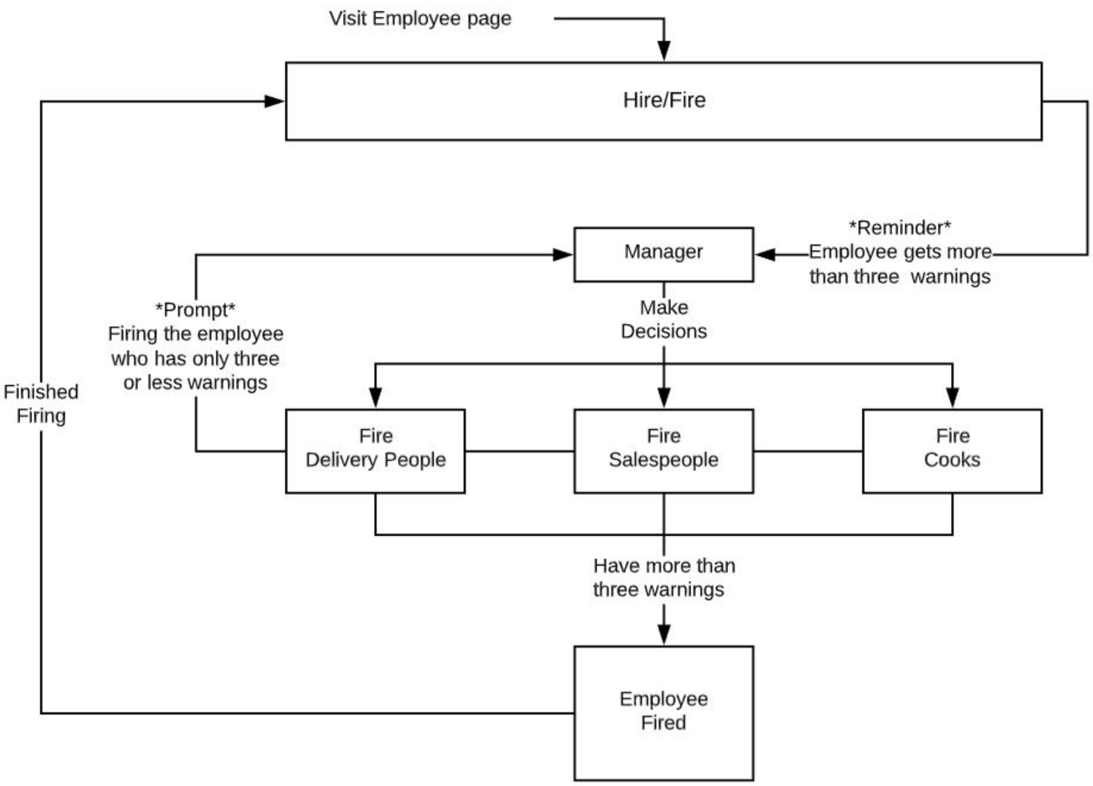
11. Give Warning



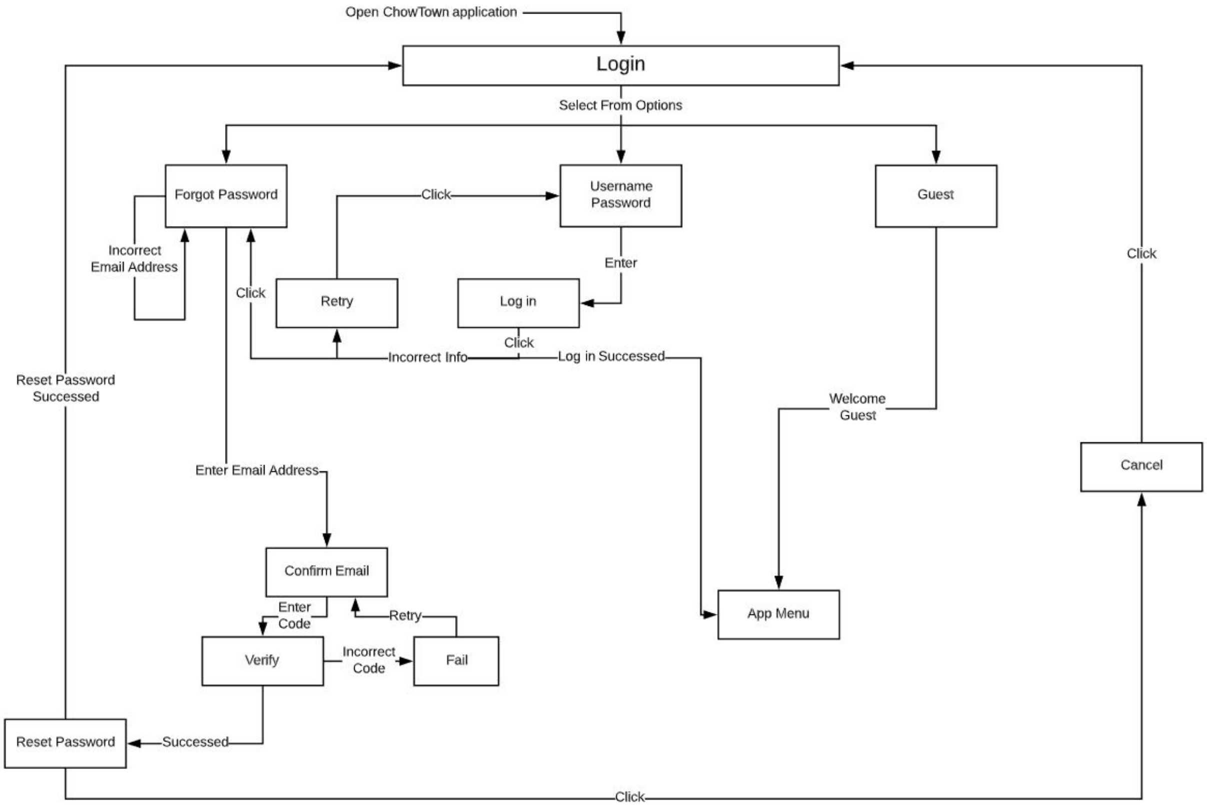
12. Give Raise/Reduce



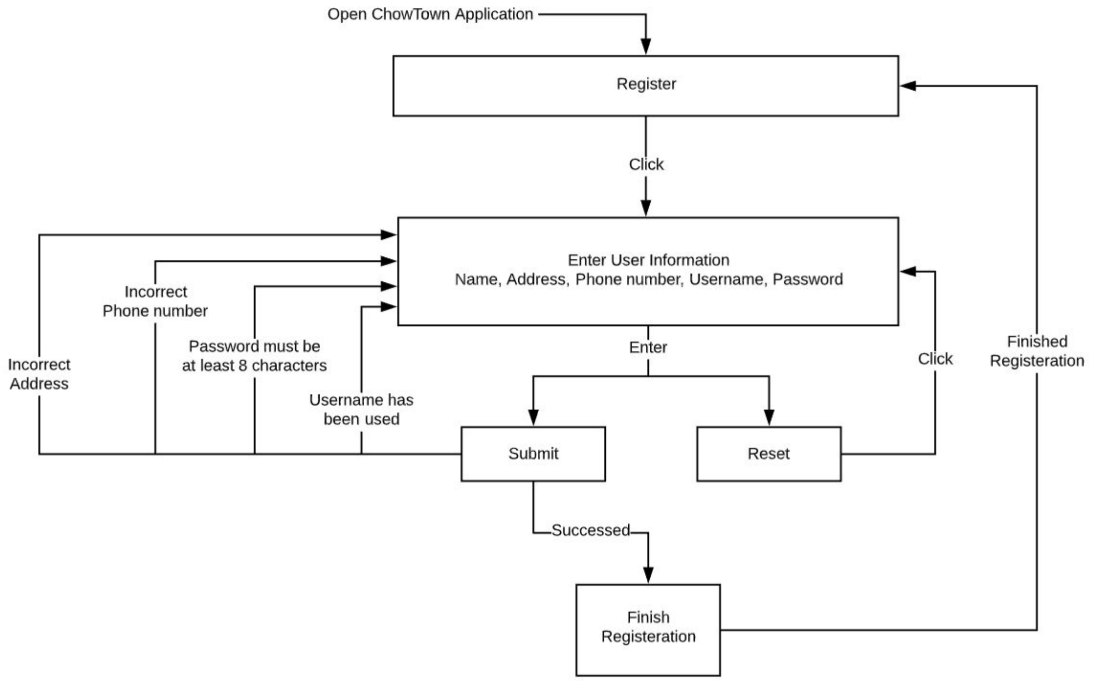
13. Hire/Fire


Visit Employee page
Hire/Fire
Reminder
Employee gets more than three warnings
Manager
Make Decisions
Prompt
Firing the employee who has only three or less warnings
Finished Firing
Fire Delivery People
Fire Salespeople
Fire Cooks
Have more than three warnings
Employee Fired

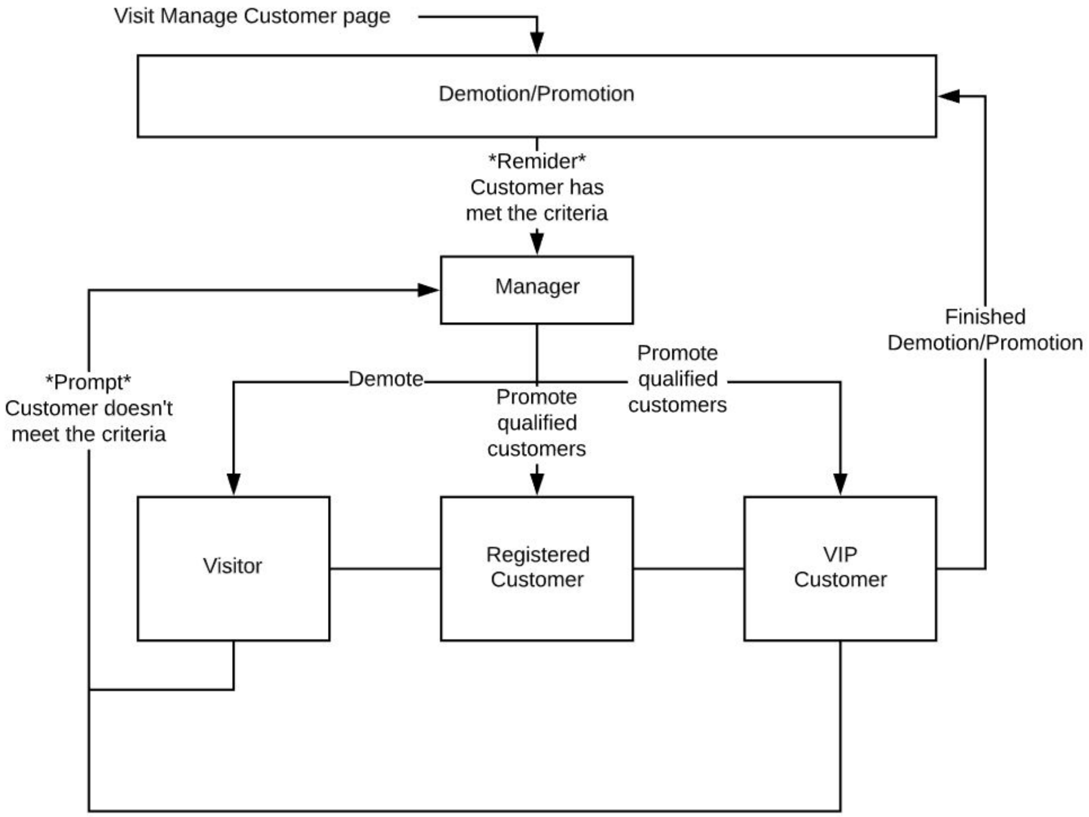
14. Login


Open ChowTown application
Login
Select From Options
Forgot Password
Incorrect
Email Address
Click
Username
Password
Click
Retry
Enter
Log in
Click
Incorrect Info
Log in Successed
Guest
Click
Welcome
Guest
Reset Password
Successed
Enter Email Address
Confirm Email
Enter
Code
Retry
Verify
Incorrect
Code
Fail
App Menu
Cancel
Reset Password
Successed
Click

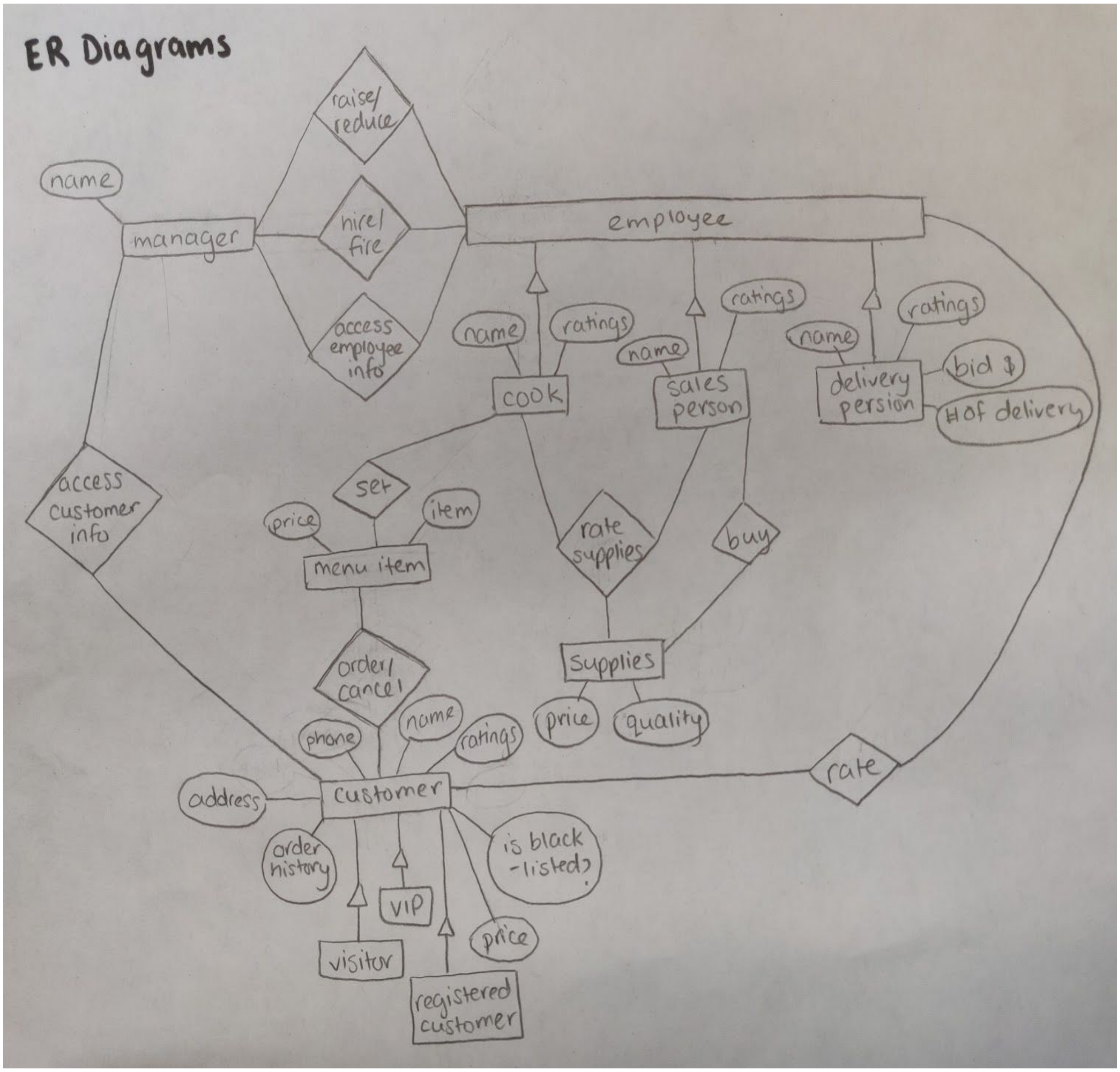
15. Register


Open ChowTown Application
Register
Click
Enter User Information
Name, Address, Phone number, Username, Password
Incorrect
Phone number
Password must be
at least 8 characters
Incorrect
Address
Username has
been used
Enter
Click
Finished
Registeration
Submit
Reset
Successed
Finish
Registeration

16. Demotion / Promotion of Users


Visit Manage Customer page
Demotion/Promotion
Remider Customer has met the criteria
Manager
Prompt Customer doesn't meet the criteria
Demote
Promote qualified customers
Promote qualified customers
Finished Demotion/Promotion
Visitor
Registered Customer
VIP Customer

3. E-R Diagram


ER Diagrams
raise/ reduce
name
manager
hire/ fire
employee
access employee info
name
ratings
cook
ratings
name
sales person
name
ratings
delivery persion
bid $
# of delivery
access customer info
set
price
item
menu item
rate supplies
buy
order/ cancel
supplies
price
quality
phone
name
ratings
address
customer
rate
order history
is black -listed?
visitor
VIP
price
registered customer

4. Pseudocode

1. Login function:

```
User input username; User input password;
Check username and password against customer database
If username and password matches a record in the database, go to restaurant choice screen
If username and password does not match any record in database, tell user that username and password does not exist
    //this can be because the username does not exist or
    //the username exists but the password is incorrect
```

2. Register function:

```
User inputs first and last name, address, phone number, username, and password
    If user does not completely fill out any of the fields, or does not input correctly, then the registration will not be complete and the user will be prompted to correctly and completely fill out the required information until complete
    If user registration is successful, user’s account is created, the user’s username, password, contact information, and blacklist status (which is false when user first registers), and customer type (Registered when user first registers) are recorded in customer database and user is redirected to restaurant choice screen
```

3. AllowOrder function:

```
Taking userID as an input, check the user’s status for the chosen restaurant
If the userID is null, meaning the user is a visitor, go to order screen
    //returns true;
If the user’s status is “blacklisted” deny access to order screen
    //returns false;
If the user’s status is !”blacklisted” go to order screen
    //returns true;
```

4. ShowRecommendations function:

```
Taking userID as an input, check the user’s order history
If the userID is null, meaning the user is a visitor, output top 3 most popular food choices by:
    Access all food items on the menu
    Iterate through the items and keep track of the top 3 items with the highest ratings
```

```
                Output the top 3 items
        Else output 3 food choices based on user's order history by:
                Access order history of the user
                Iterate through the items and keep track of the top 3 items with the
                highest ratings
                Output the top 3 items

5.  Order function:
        User inputs their chosen food items
        Order information is stored in order records of the restaurant

6.  CancelOrder function:
        Taking orderID, the current time as input
        Access all order records of the restaurant and get the order of the specific
        orderID
        If the current time - order's time < 10minutes OR current time - order's
        time > the order's delivery time
                Return true //the order can be canceled
        Return false //in every other case, the order cannot be canceled

7.  ProcessOrder function:
        Taking an order as an input
        Iterate through the items in the order and check if for each item, the
        supplies needed to make it are enough by:
                Access supplies in the restaurant
                For each item:
                        Check if the number of supplies - the number of supplied
                        needed for that item is >= 0
                        If <= 0, item cannot be made so return false
                        If >= 0, item can be made so update the number of
                        supplies
                Return true //when all items are made

8.  GiveDiscount function:
        Taking userID as input.
        If userID is !null //meaning the customer is not a visitor
                Check the user's status
                If the status is "registered" give 10% discount on user's order
                amount
                If the status is "VIP" give 10% discount on user's order amount
                AND display on screen additional food items the user can choose
                to order for free
```

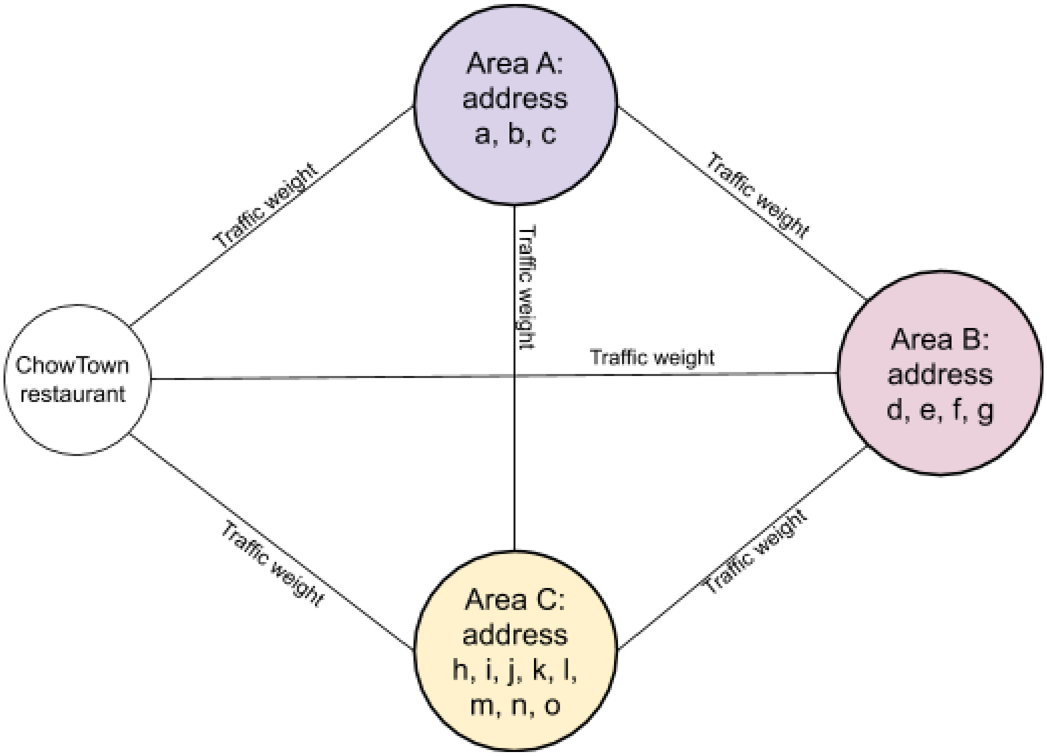
9. Bid function:

    Taking all bids from the delivery person and the corresponding delivery person's id as an input
    Iterate through the bids and keep track of the lowest bid
    Return the delivery peron's id of the lowest bid

10. FindRoute function:

    Taking the address of the customer's order
    Find the most optimal route based on traffic by using Dijkstra's algorithm:

    Context: We assume that our restaurant only delivers to a certain radius/extent within the city. We divide this delivery scope into three areas, each containing a set of addresses. Each area represents a "node" in the "graph" of our delivery zone in the city. Our restaurant is another node on the graph:



The weights on each path represent the traffic on that specific path, and this weight will vary from time to time to emulate changing traffic. We can now run dijkstra's algorithm on this graph.

Pseudocode:

```
String destination_address                //the user inputs this; user's address
If destination_address is not in A, B, or C   // if destination_address!= a...o
        Print to user "We do not deliver to your area/address"
        Do not deliver; cancel delivery order
```

```
if destination_address is in A
    Use Dijkstra’s to find the path with the least traffic between ChowTown and Area A
if destination_address is in B
    Use Dijkstra’s to find the path with the least traffic between ChowTown and Area B
if destination_address is in C
    Use Dijkstra’s to find the path with the least traffic between ChowTown and Area C
```

11. GiveRating function:

```
Taking the userID as an input
If userID is “registered” OR “VIP”
    Take user input for each food item and the delivery person’s rating
    Update the rating for the food item, cook, and delivery person on the corresponding database
    Make customer’s current order rating = true //noting that the customer has already rated the order
If userID is “delivery”
    If current customer’s current order rating = false
        Take user input for customer’s rating
        Update rating for customer on customer database
If userID is “cook”
    Take user input for salesperson’s rating
    Update rating for salesperson on employee database
```

12. SetMenu function:

```
Taking food information as input
Access all the food items in the restaurant
Iterate through all the food items:
    If the item’s average rating on recent orders < 2, delete off of menu and increase delete count by 1
    //average rating on recent orders: an attribute of the item that
    //keeps track of the average rating of the item on the last 3 orders
    //and is updated each time a customer rates the item
    //delete count: keeps track of the number of times a cook deleted
    //a menu item from the menu
```

13. BlacklistCustomer function:

```
If manager clicks on blacklist customer button
    Customer will get a blacklist status added to the customer database
```

```
14. DemoteCustomer function:
        If customer’s userID = null
             make demote button invisible
        If customer’s userID is “registered”
             change customer’s userID from “registered” to null
            in the customer database
        If customer’s userID = “VIP”
            change customer’s userID from “VIP” to “registered” in
            the customer database
```

```
15. PromoteCustomer function:
        If customer has userID of “VIP”
            make promote button invisible
        If customer has userID of “registered”
            change customer’s userID from “registered” to “VIP” in
            the customer database
        If customer userID = null
            Change customer’s userID to “registered” in the customer
            database
```

```
16. WarnEmployee function:
        If employee selected has userID of “delivery”
            Check the 3 most recent ratings from the delivery person and find
            the average of those ratings
            If the average calculated < 2,
                then add 1 to the delivery person’s warning count in the
                employee database
        If employee selected has userID of “cook”
            If the delete count attributed to the cook >= 2
            //delete count counts the number of times a cook deleted a menu
            //item from the menu
                then add 1 to the cook’s warning count in the employee
                database
        If employee selected has userID of “salesperson”
            If the complaint count attributed to the salesperson > 3
                Then add 1 to the salesperson’s warning count in the
                employee database
        //warning count of each employee is initially set to 0
```

```
17. Fire function:
        Take userID as an input
        If ID is “delivery” OR “cook” OR “salesperson”
        If the warning count of the employee > 3, then delete the employee off of employee database
```

18. Hire function:

```
Access the employee database
numberOfDeliveryperson = 0;
numberOfCook = 0;
numberOfSalesPerson = 0;
Iterate through the employee database
    For each employee get the ID
        If numberOfDeliveryPerson  >= 2 AND numberOfCook >= 2 AND numberOfSalesPerson >= 2
            Return null //meaning hiring of employee is not needed
        If userID is “delivery”, increment numberOfDeliveryPerson
        If userID is “cook”, increment numberOfCook
        If userID is “salesperson”, increment numberOfSalesPerson
    Return numberOfDeliveryPerson, numberOfCook, numberOfSalesPerson //meaning hiring of employee is required
```

19. UpdateSalary function:

```
Take userID as an input
If userID is “cook” OR “delivery” OR “salesperson”
    Access employee database
    For each employee
        If the average rating is > 4.3, increase current salary by 2
        If the average rating is < 3  but > 2 decrease the current salary by 2
```

20. UpdateCommission function:

```
Take userID as an input
If userID is “salesperson”
    Access employee database
    Iterate through the employee database
        For each employee if it is a “salesperson”
            If straightFive is true increase the salesperson’s current commission by 10% and make straightFive to false
            If complainedThree is true decrease the salesperson’s current commission by 10% and make complainedThree to false
```

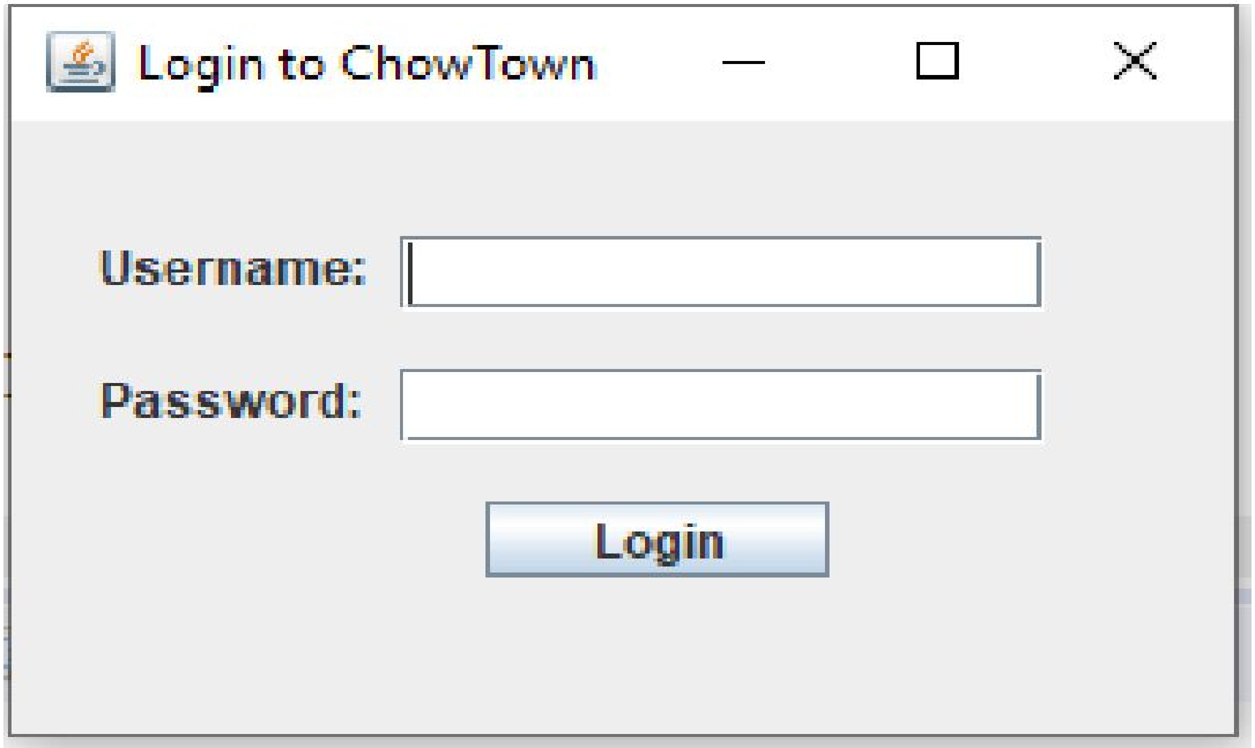
```
                //straightFive: an attribute of each salesperson
                where it is initially false but is true when he/she
                gets 3 straight rating of 5’s and is checked/updated
                each time a cook rates the supply
                //complainedThree: an attribute of each
                salesperson where it is initially false but is true
                when he/she gets a complaint 3 times and is
                checked/updated each time a cook rates the supply
```

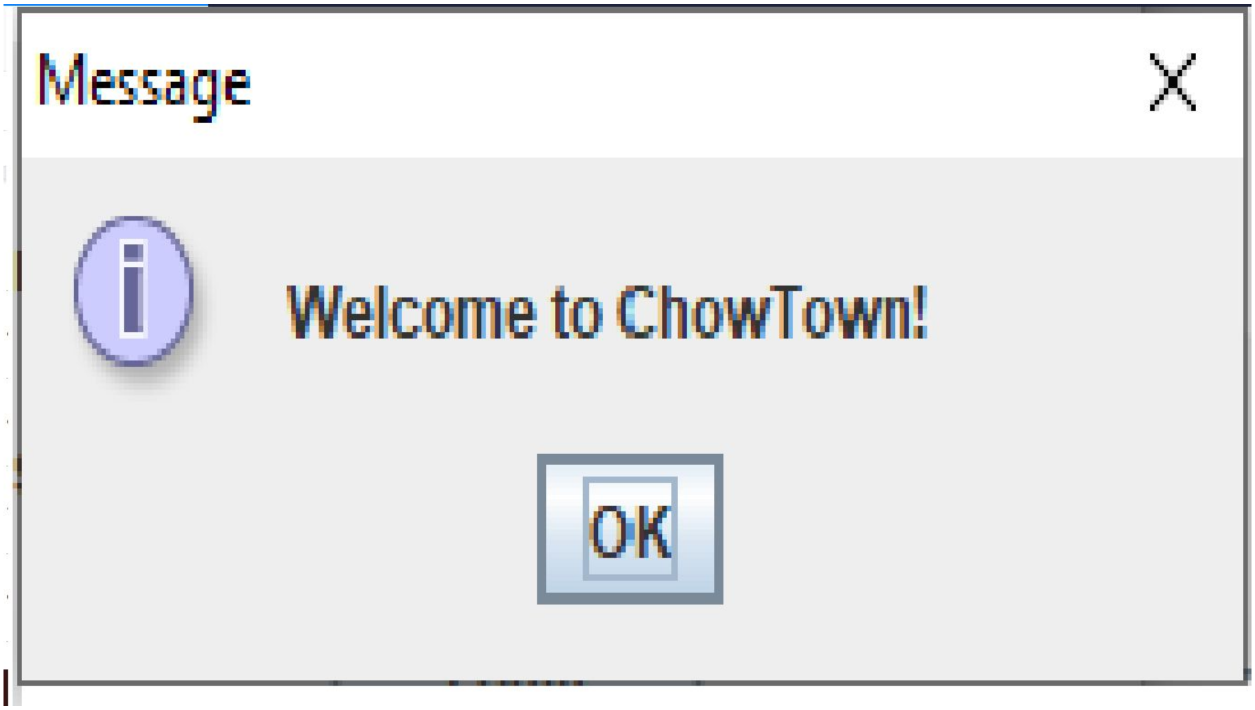
```
21. BuySupplies function:
    Takes userID and as an input
    If userID is “salesperson”
        Access supplies database for the restaurant
        Display each supply and the current quantity of the supply
        Display a button to submit the supply order
        Get user input for each item that decides how much to buy
        When the button is clicked:
            For each supply increase the current quantity by the
            corresponding user input
```

5. System Screens

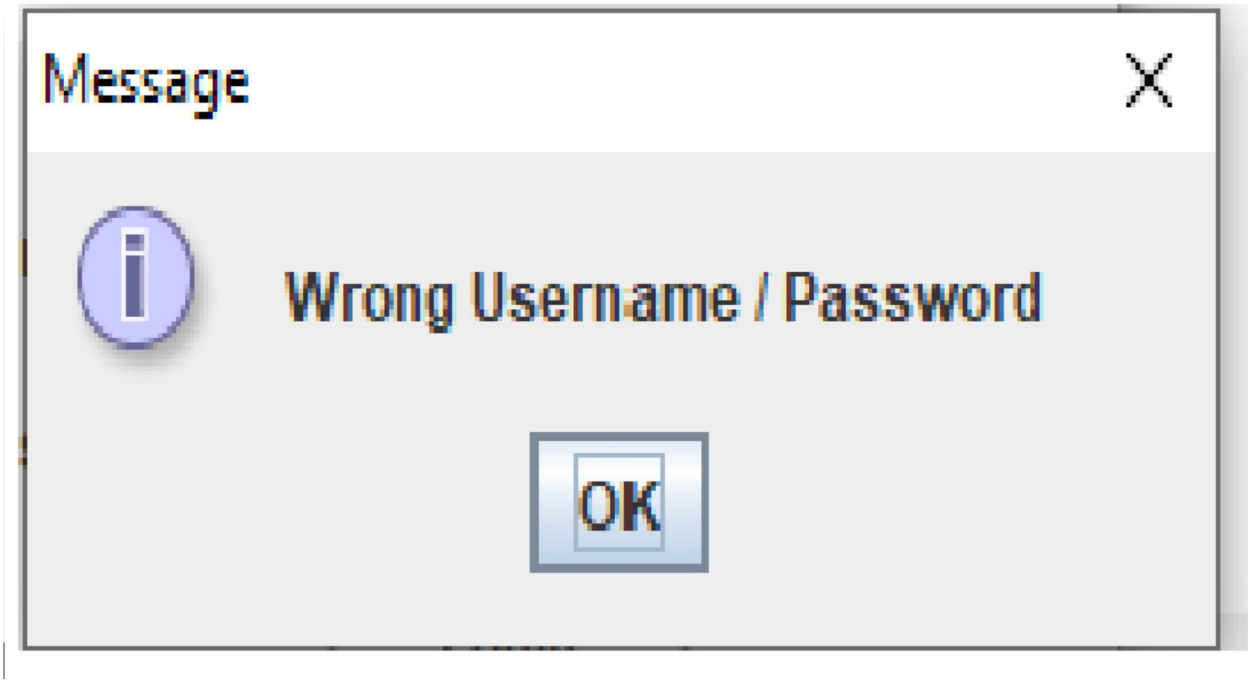
Prototype of login functionality can be found below:
https://github.com/mkhan14/322-Project

Login:



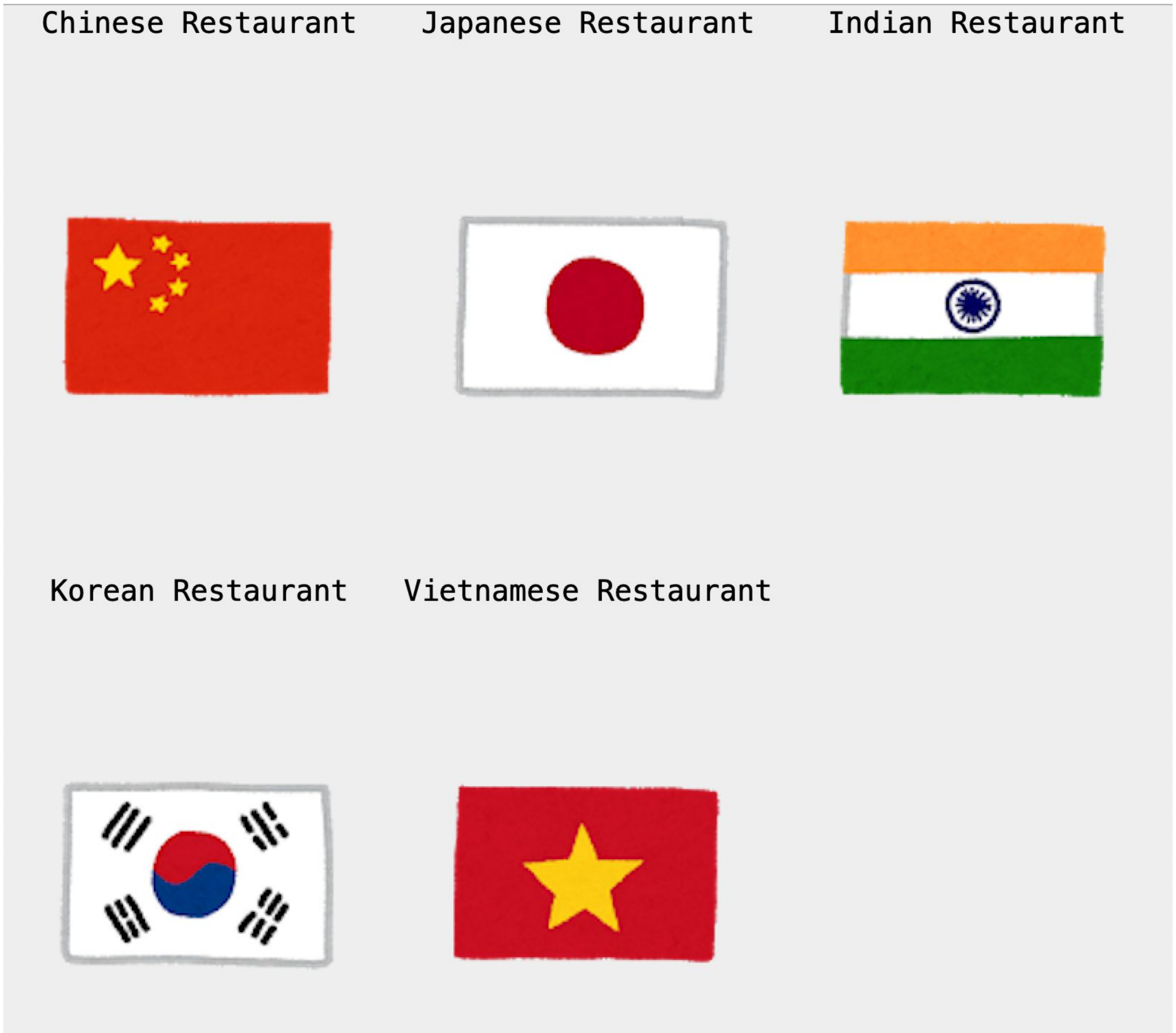


Welcome to ChowTown!

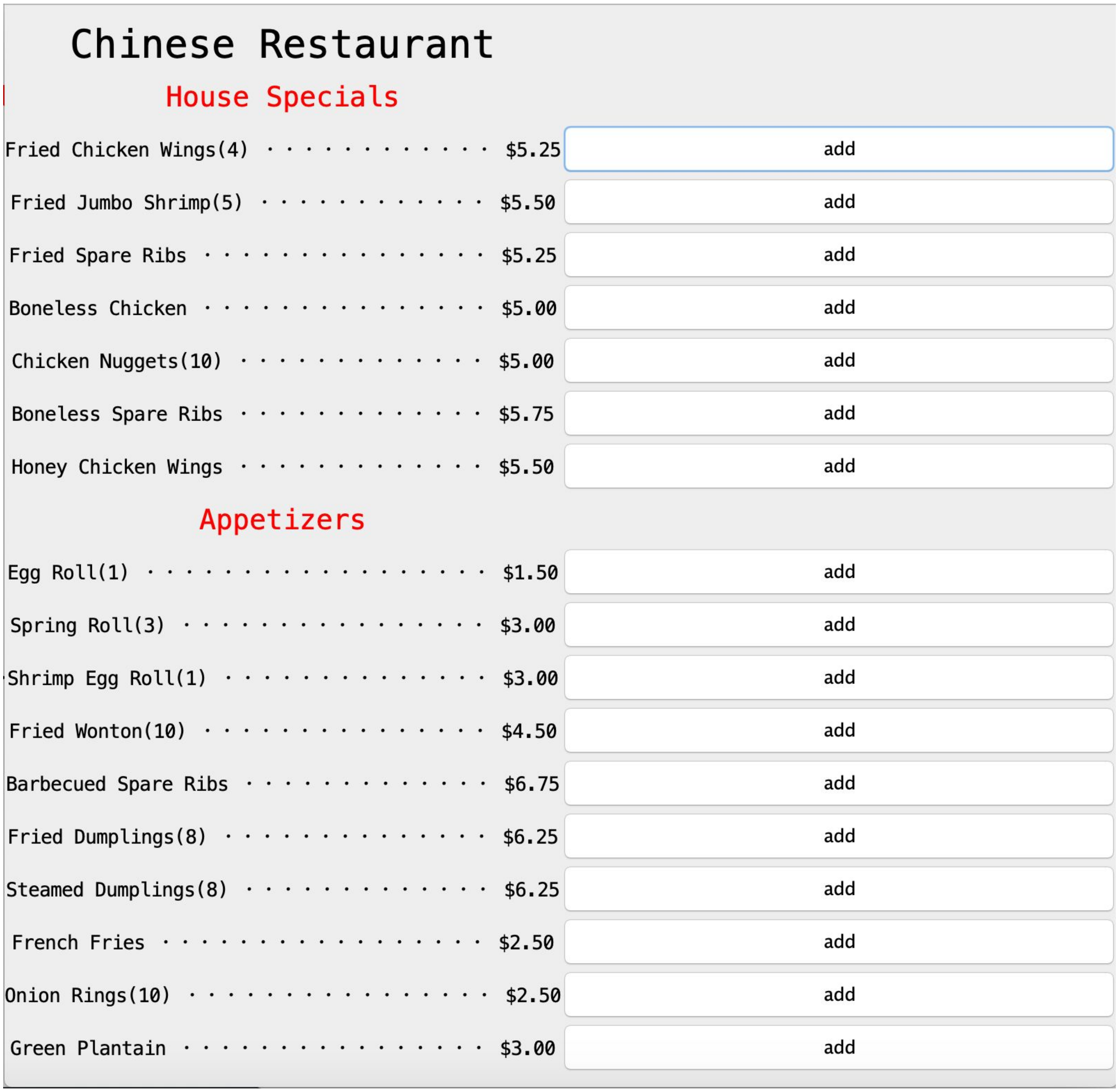


Wrong Username / Password

Restaurant Page: user can choose a restaurant



Menu Page: users can add a food item to their cart



Chinese Restaurant

House Specials

Fried Chicken Wings(4)	$5.25	add
Fried Jumbo Shrimp(5)	$5.50	add
Fried Spare Ribs	$5.25	add
Boneless Chicken	$5.00	add
Chicken Nuggets(10)	$5.00	add
Boneless Spare Ribs	$5.75	add
Honey Chicken Wings	$5.50	add

Appetizers

Egg Roll(1)	$1.50	add
Spring Roll(3)	$3.00	add
Shrimp Egg Roll(1)	$3.00	add
Fried Wonton(10)	$4.50	add
Barbecued Spare Ribs	$6.75	add
Fried Dumplings(8)	$6.25	add
Steamed Dumplings(8)	$6.25	add
French Fries	$2.50	add
Onion Rings(10)	$2.50	add
Green Plantain	$3.00	add

6. Group Meetings

Group Meetup	Date	Minutes
1	11/23/19	-talked about major details and logistics of the program -set goals to divide up and complete diagrams by next meetup date
2	11/25/19	-checked and completed diagrams -took care of the github -completed some pseudocode
3	11/26/19	-finished pseudocode -finished the GUI requirements