Database Management Systems Lab (CO303)

Report: Night Canteen Order Management System

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Introduction

Presently students in hostels of NITK have to call the various night canteens that are present and place their order. But this method poses a lot of problems, some of which are:

- ❏ The students have to call the night canteen which costs money.
- ❏ Lack of proper menu for the students to order from.
- ❏ Students are kept in the dark about the status of the order.
- ❏ Problems due to lots of students calling the night canteen at the same time.
- ❏ Loss of orders due to poor management in the night canteen.
- ❏ If the student goes to the Night Canteen to eat he will have to wait for quite a bit of time for the food to be prepared.

We hope to remove all these problems by creating a online platform where the students can place their orders. This document defines all the requirements of the NC management system.

The idea of the project is to build a web application that would make the process of ordering food from night canteen seamless. This application would have everything from the ratings and reviews of food items available to the status of your orders. The students will have to login using their credentials and then they have to choose the food items they want to order from the displayed menu and the order will be created. The user will then have a choice whether to have the food delivered to their hostel blocks or go to Night Canteen and eat.

Features

Student Features

- ❏ This project is for all the Night Canteens in the campus.
- ❏ The online platform will provide the list of different Night Canteens along with the along with the various available food items.
- ❏ The customer has to login to open the web app. If the customer does not have an account he/she can register by inputting the required details.
- ❏ A customer can select any item from any canteen and add them to his/her cart and then place the order.
- ❏ The customer can view his/her past orders in the order history tab.
- ❏ The customer will also be able to see the status of his/her orders.
- ❏ The customer has an option to rate the food items.
- ❏ The customer will have a choice of either having the order delivered to their respective hostel blocks or go to the Night Canteen and have their food.

Canteen Manager Features

- ❏ The Canteen Manager can login to the Night Canteen he/she manages.
- ❏ He/She can view the list of food items along with its details provided by the Night Canteen.
- ❏ He/She will be able to add/delete new food items.
- ❏ He/She will also have an option to modify the details of the existing food items.
- ❏ The Manager will also be able to view all the orders that are placed by the customers.
- ❏ The Manager can either accept/reject the orders placed and assign delivery boys to each of the orders.
- ❏ The manager can also add/delete delivery boys' information of the Night Canteen.

Requirement Analysis

Student Requirements

- ❏ Each student would require his own credentials (valid email ID and password) in order to login and place an order.
- ❏ The password has to stored in the database in hashed format for ensuring the protection of the data.
- ❏ If the student does not have an account he will have to create an account by entering the required details (Name, Phone Number, Email ID, password and Address).
- ❏ The the list of night canteens available should be displayed to the user once he/she has logged in.
- ❏ The user can choose any of the night canteens and its menu should be displayed along with the price, expected delivery time and it's rating.
- ❏ The user also has a option to search for the required food item using the keywords of the food.
- ❏ The user should also be able to search for the food items based on the category of the food item.
- ❏ Once the user clicks on a food item in the menu he/she should be able to view the ratings and reviews made by other users.
- ❏ The user should then be able to choose the quantity of the food item he/she wishes to order and the food item will be added to the cart.
- ❏ The user should be able to view the cart and be able to modify the quantity of the food items.
- ❏ Once the user has chosen all the food items he/she wishes to order, the user should be able to place the order by clicking the place order button.
    - While placing the order the user should have an option as to whether he/she wants the food to be delivered to their hostels or he/she wants to eat at the night canteen itself.

- The user should also be able to rate and write reviews for the items he/she has ordered.
- Once the order has been placed the user has to notified about the status of the food(ready or not).
- If the user has chosen the option of the food being delivered to the hostel the user should be notified of the name of the delivery person.
- If the user had chosen the option of having the food at the night canteen itself, he should be notified at least 10 minutes before the food is ready.

❏ The user should also be able to able to view his/her order history.

NIght Canteen Manager's Requirements

❏ Each manager would require his own credentials in order to login and place an order.

❏ The managers of the night canteen have to contact the admin of the application to be given an id for future use in the system.

❏ The Canteen Managers should be able to add food items (Name, Price, Category, Image)

❏ They should also be able to edit the existing food items and also delete the food items.

❏ The Manager should be able to view the placed orders of all the customers along with all the details (Order ID, Name, Food Items orders and its quantity, total bill amount, address of the customer).

❏ The Canteen Manager should be able accept/reject the orders placed by the customers.

❏ The Manager should also be able to add new delivery boy information or delete the existing delivery boys.

- ❏ Managers should also be able to assign delivery boys to deliver the prepared orders.
- ❏ The Canteen Manager should also be able to update the status of the orders (Waiting Confirmation to being prepared, and being prepared to prepared).

Database Requirements

The online platform uses a database to store the details of the users, the menu of the Night Canteens, the details of the orders placed, details of the canteen manager and many more details. The database consists of several tables. The list of tables are:

1. Student Table having the following attributes:
    a. SID: The ID assigned to the customer to uniquely identify the customer in the database.
    b. Name: A composite attribute which consists of the first_name, middle_name and last_name.
    c. Address: A composite attribute which consists of Block number, Floor, Room Number.
    d. Phone Number: It stored the phone number of the user which is also unique to all of the students.
    e. Email Id: The email account the student will be using to login to the online platform.
    f. Password: The password entered by the student which will be stored in hashed format in the database for the protection of the student's account.

2. Night Canteen Table having the following attributes:
    a. Night Canteen Name: The name of the Night Canteen. This is an unique attribute.
    b. Night Canteen ID: A primary key used to uniquely identify all the night canteens.
    c. Manager: The name of the night canteen employee responsible for managing the night canteen.
    d. Phone Number: A multivalued attribute which stores the list of phone number the can be used to contact the night canteen.
    e. Location: The address of the night canteen.
    f. Timing: A composite attribute which stores the start and end timings of the night canteen which indicates the duration when the Canteen remains open.

3. Food Item table having the following attributes:
    a. Name: The name of the food item.
    b. Food ID: A primary key used to uniquely identify all the food items in the database.
    c. Availability: A boolean value to indicate if the food item is currently available or not.
    d. Price
    e. Canteen ID: Stores the ID of the Night canteen where the food item is available. This attribute references the Canteen Manager ID from the canteen manager table.
    f. Rating: The rating of the food item which is calculated by averaging over all the ratings submitted by the students.

g. Reviews: A composite attribute consisting of the User_ID, the comment and the rating given by the user.
h. Preparation Time: The time that is required to prepare the food item in minutes.
i. Image of the food item: It stored the path of the image of the food item on the server side.

4. Order table having the following attributes:
    a. Bill ID/Order ID: A primary key used to uniquely identify all the orders in the database.
    b. User_ID: The ID of the user who placed the order.
    c. Date: The date when the order was placed.
    d. Items: A composite multivalued attribute which stores the list of all the food items along with their quantities and price.
    e. Total Amount: The bill amount which is calculated by summing up all the prices of the individual items in the order.
    f. Status: A enum type to indicate whether the order is being prepared, awaiting confirmation or has been prepared.

5. Canteen Manager Table having the following attributes:
    a. Name
    b. NC_ID: The ID of the Night Canteen he/she manages. This is foreign key to the NC ID of the Night Canteen table so as to identify the NC the Manager manages.
    c. Login Credentials: A composite attribute which stores the user_name and password used by the managers to login.This include the username and the password which will be provided by the administrator of the system.

6. Delivery Boy Table having the following attributes:
    a. NC_ID: The ID of the Night Canteen he/she works for.
    b. Vehicle Registration Number: The registration number of the vehicle he/she uses.

7. User Cart Table is a temporary table which stored the details of the order to be placed by the customer having the following attributes (This table will be created when the user logs in and will be reset when the user places the order and deleted when the user logs out.):
    a. SID: The ID of the student who is placing the order, which is an foreign key which references the Student ID of the Student table which will be used to find out the destination address.
    b. FoodID: The ID of the food ID that the customer wishes to buy. It is an foreign key to the Food item ID in the Food Item Table.
    c. Price: The rate of the item to be ordered.
    d. Quantity: The number of food items of each type the user wishes to order.

Website Requirements

Student Side:

1. Login Screen: The web app should display a form where the users can enter the credentials and pass the input to the backend.
2. Registration Screen: The web app should also provide a form where the users can input their information to create a new account.
3. Night Canteen Details Screen: After successful login, the user should be redirected to a screen displaying the list of different Night Canteens.

4. Night Canteen Food Items Scree: Once the user selects the Night Canteen, the food items served in the selected Night Canteen should be displayed.The screen should also have a search bar where the user can search for the required food item using the keywords of the food. Once the user has added all the required food items to the cart there should be an option to checkout and place the order.
5. Food Item details Screen: If the user select a food item he will be shown the details of the food item:
    - The price of the food item.
    - An image of the food item.
    - The ratings of the food items.
    - A option to rate the food-item.
    - An option to add to cart.
6. Order History Screen: The user can also view his/her profile which shows the order history of the user as well as the status of the current order.

Manager Side

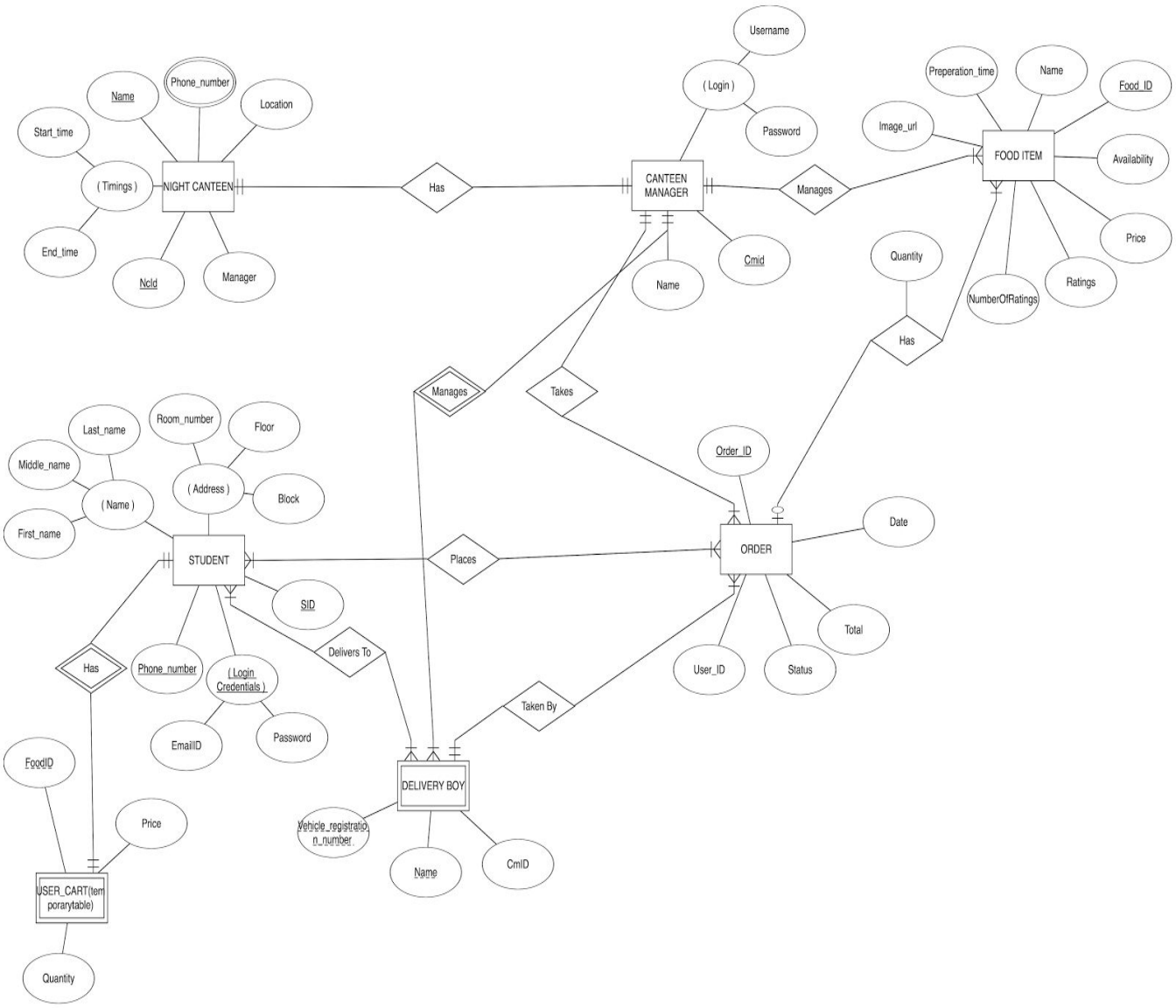
1. Login Screen: The web app should display a form where the users can enter the credentials and pass the input to the backend.
2. Admin Dashboard: After successful login, the Canteen manager should be redirected to a screen the following options:
    - Add a food-item from the menu: This tab should display a form where the Manager can enter the details of the food item to be added.
    - Remove/Modify an existing food-item: This tab should display the list of existing food items and provide buttons to edit and remove food items.
    - View the list of all the orders placed: This tab should display all the pending orders.

- Manage the delivery staff: This tab should allow the manager to add/remove delivery boys.

Design

ER Diagram:

The Entity-Relationship Diagram of the NIght Canteen Management System is given below:



Legend

-  : Participation of 1 (numbers used in ratios 1:1, 1:N , N:1 etc)
- : Participation of N
- : Total Participation
-  : Partial Participation

Relation Schema:

Normalisation Steps:

1. **The first Normal Form obtained by applying the steps to convert the ER Diagram to Relational Schema:**

Night Canteen

NcID Name Location Start_time End_time CmID(FK)

Phone Number

NcID(FK) Phone_number

Canteen Manager

CmID Name Username Password

Food Item

FoodID Name Price Availability ImageURL Ratings Num_ratings PreparationTime CmID(FK)

Orders

OrderID ODate Total UserID Status CmID(FK)

Items

OrderID(FK) FoodID Quantity

Student

SID FirstName LastName PhoneNumber EmailID Password RoomNo Floor BlockName

Student-Order

SID(FK) OrderID(FK)

Delivery Boy

CmID(FK) Name RegNo NcID(FK) SID(FK)

User Cart

SID(FK) FoodID(FK) Price Quantity

2. The table Delivery Boy has a partial dependency, so it has to split into two table for the second normal form. It is also in 3rd NF (and BCNF) as there are no transitive relations and the relations do not have multiple overlapping candidate keys.

We split the Delivery boy into two tables in order to remove partial dependency of RegNo -> Name. The resulting relation schema of the table is as follows:

Night Canteen

NcID Name Location Start_time End_time CmID(FK)

Phone Number

NcID(FK) Phone_number

Canteen Manager

CmID Name Username Password

Food Item

FoodID Name Price Availability ImageURL Ratings Num_ratings PreparationTime CmID(FK)

Orders

OrderID ODate Total UserID Status CmID(FK)

Items

OrderID(FK) FoodID Quantity

Student

SID FirstName LastName PhoneNumber EmailID Password RoomNo Floor BlockName

Student-Order

SID(FK) OrderID(FK)

Delivery Boy

RegNo Name

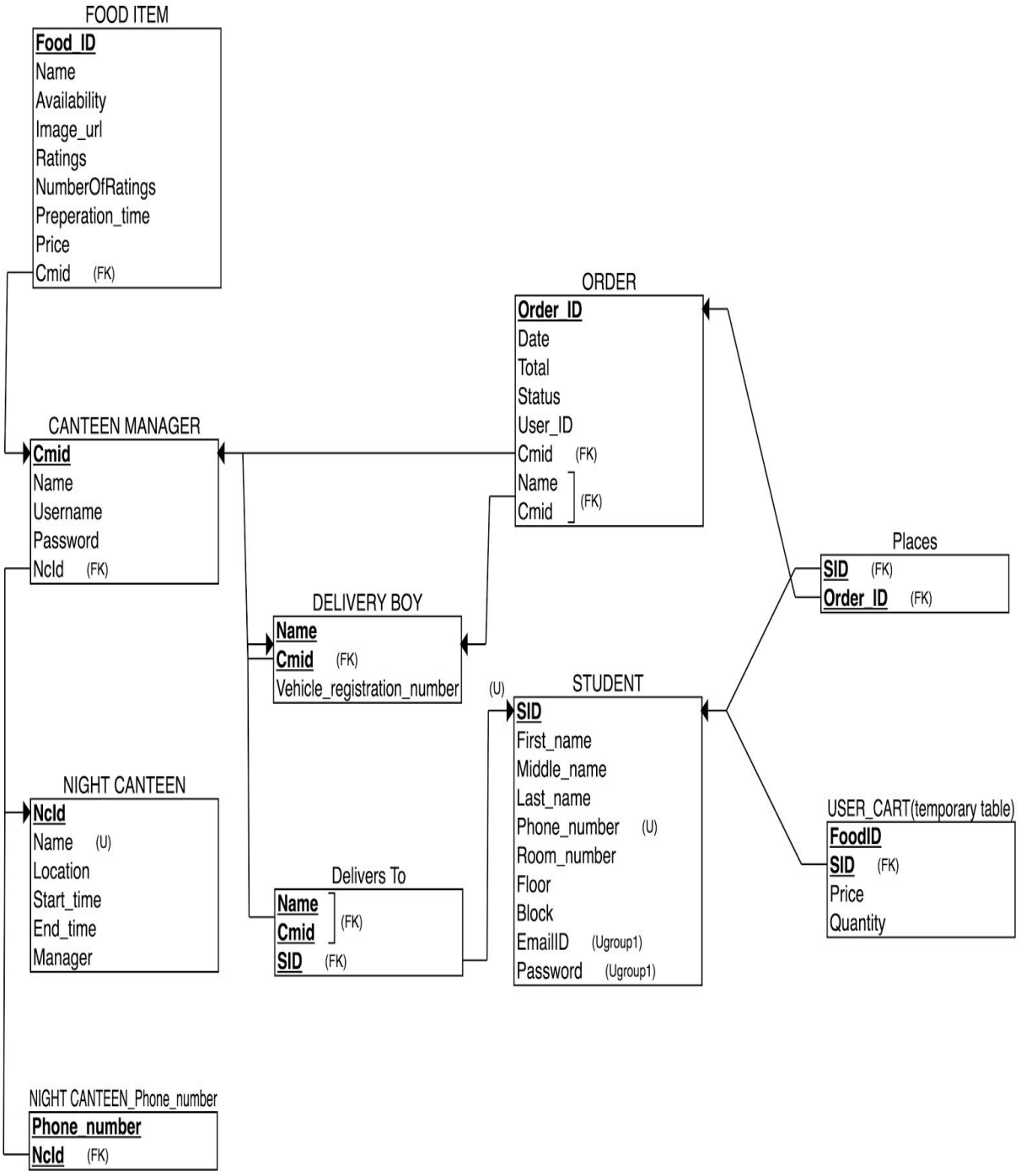
Delivery Boy-Order details

CmID(FK) RegNo(FK) SID(FK)

User Cart

SID(FK) FoodID(FK) Price Quantity

The **schema** of the Night Canteen Management System is given below:



Implementation

The backend of the web app was developed using the Python and the Flask Package. Here Flask was used to route the web pages based on the URL given. Also the python script was linked to the MySQL database using the Flask API.

The database used to store and retrieve the data was MySQL. The MySQL database was connected to Python script using the MySQL module of flaskext. The tables were created in the python script so there was no need for separate mysql database setup. We also created many procedures for add/deleting modifying elements from the table which were called using the callproc function of Flask. We also used lot of correlated nested queries to retrieve specific information from the database which were invoked using the execute function of Flask.

The Front End Framework that was used for the webpages was HTML, CSS, and Javascript.

Conclusion and Future Work

The project was completed and tested by hosting the website on two different host and testing out the various functionalities of the customer as well as the Canteen manager. But, we were not able to complete a few functionalities due to the time constraint, which were:

- Adding review option for the customer.
- Allowing the customer to login using their already existing gmail or facebook accounts.

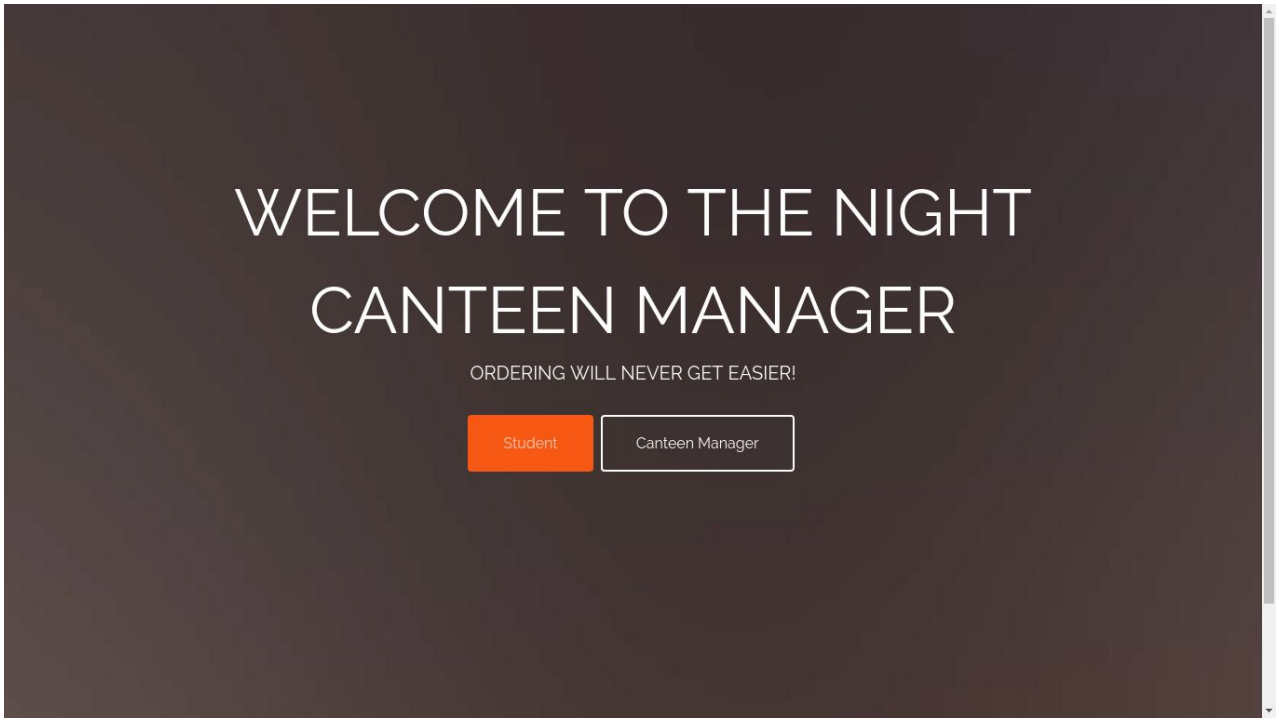
We could extend this project further by hosting the database on a online server so that the users of the system can use any internet connection for accessing the web application and not any specific network.

We had to learn a lot of new softwares to complete the project which include the Flask package of python which was used in the backed for routing the web pages, HTML and CSS for designing the forms and the webpages.

Screenshots

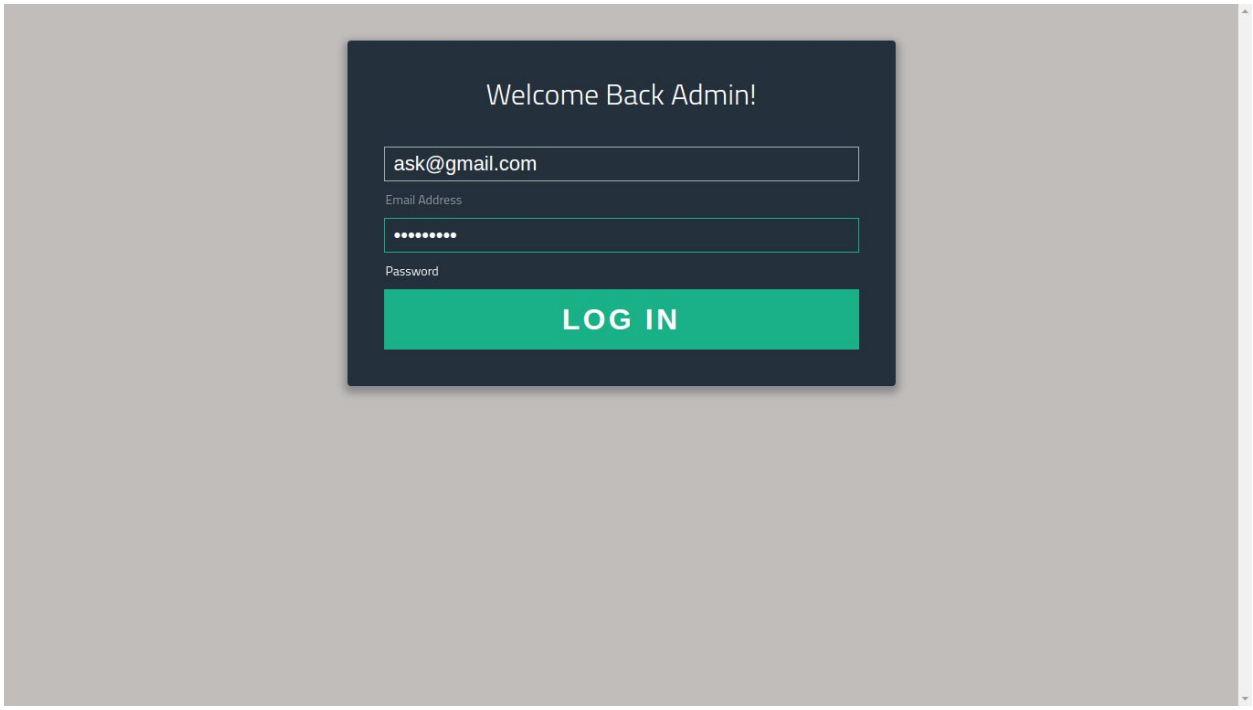
1) Homepage

This is the homepage of the web application. The users have to click on “Student” or “Canteen Manager” depending upon who they are.



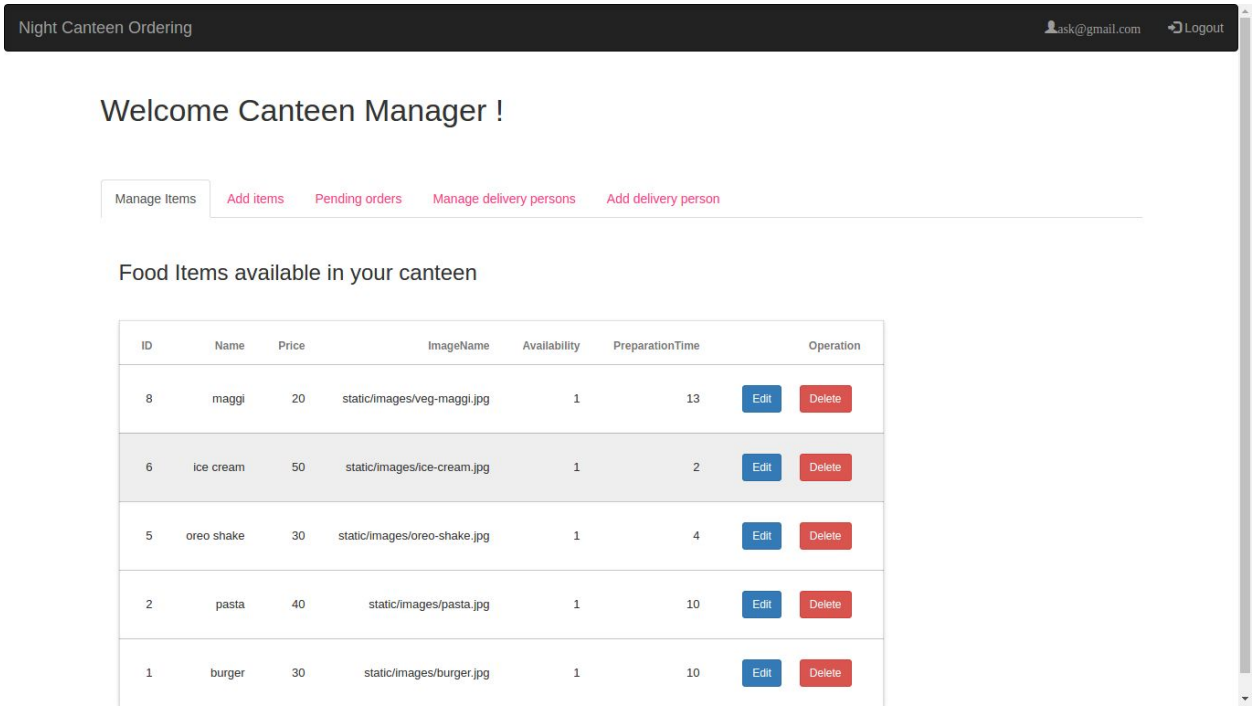
2) Login for Canteen Manager

For the four night canteens that are present logins have been created for them and will be given to the respective canteen managers who can use it to login here. The credentials given here are for 3rd Block night canteen.



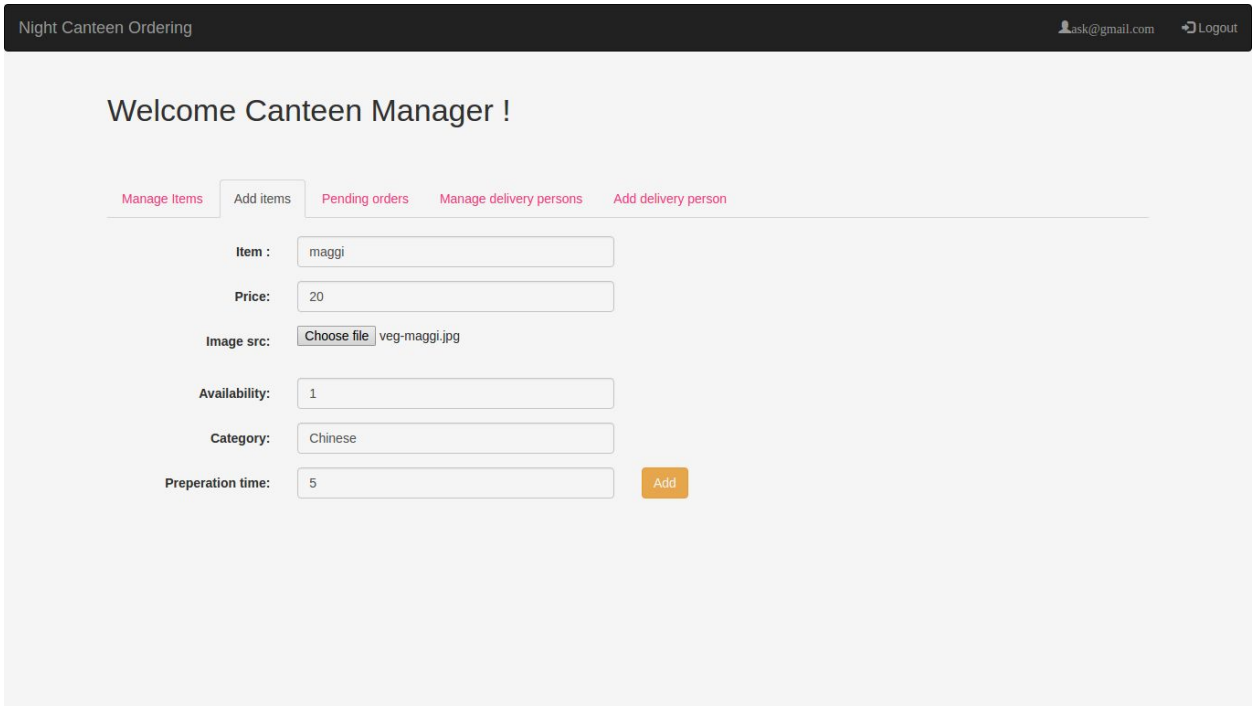
3) Admin Dashboard : Manage items

The various views for the admins are shown in the picture below.

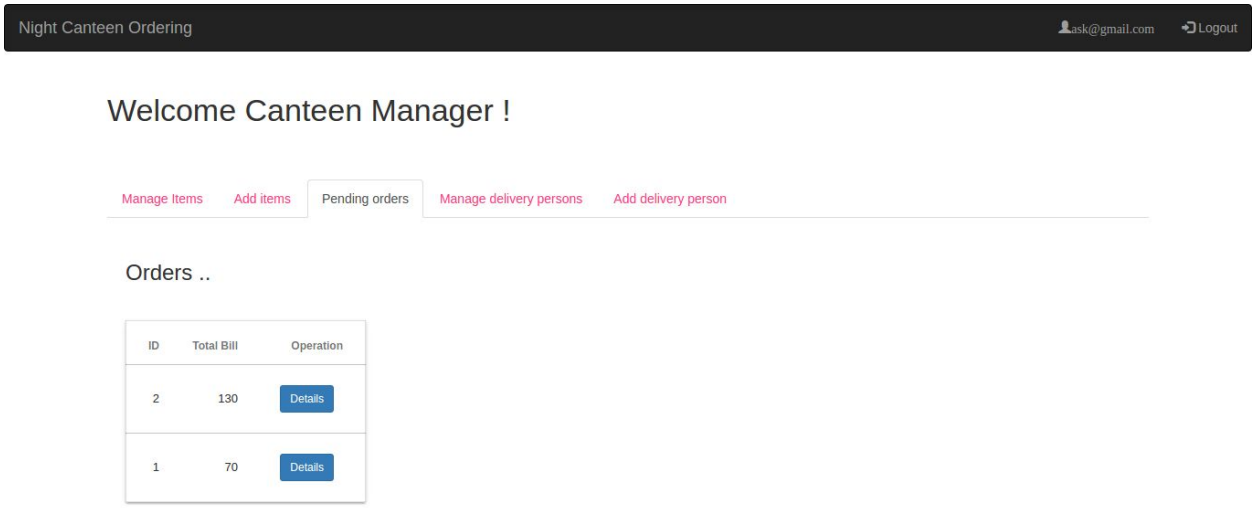


4) Admin dashboard : Add item

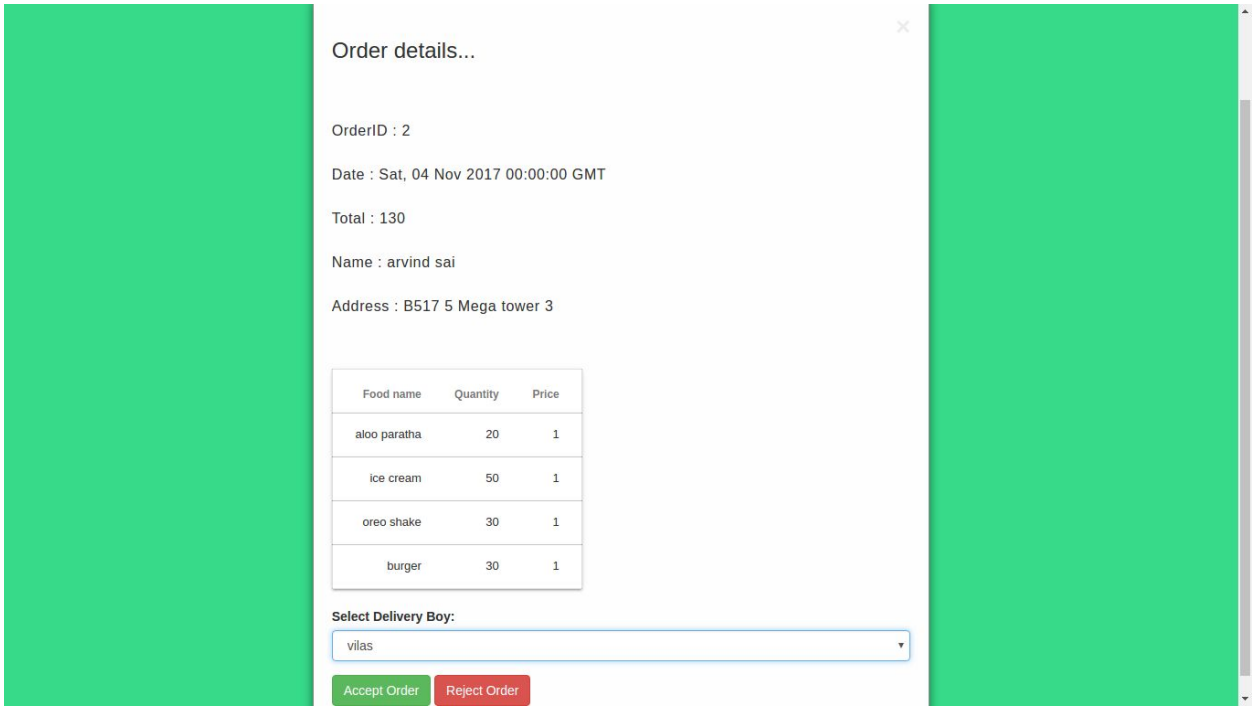
The admin can add items as shown below.



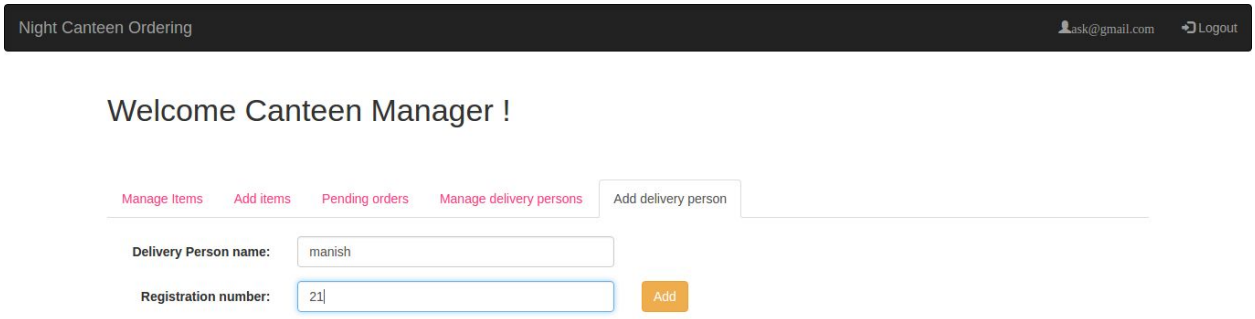
5) Admin View orders



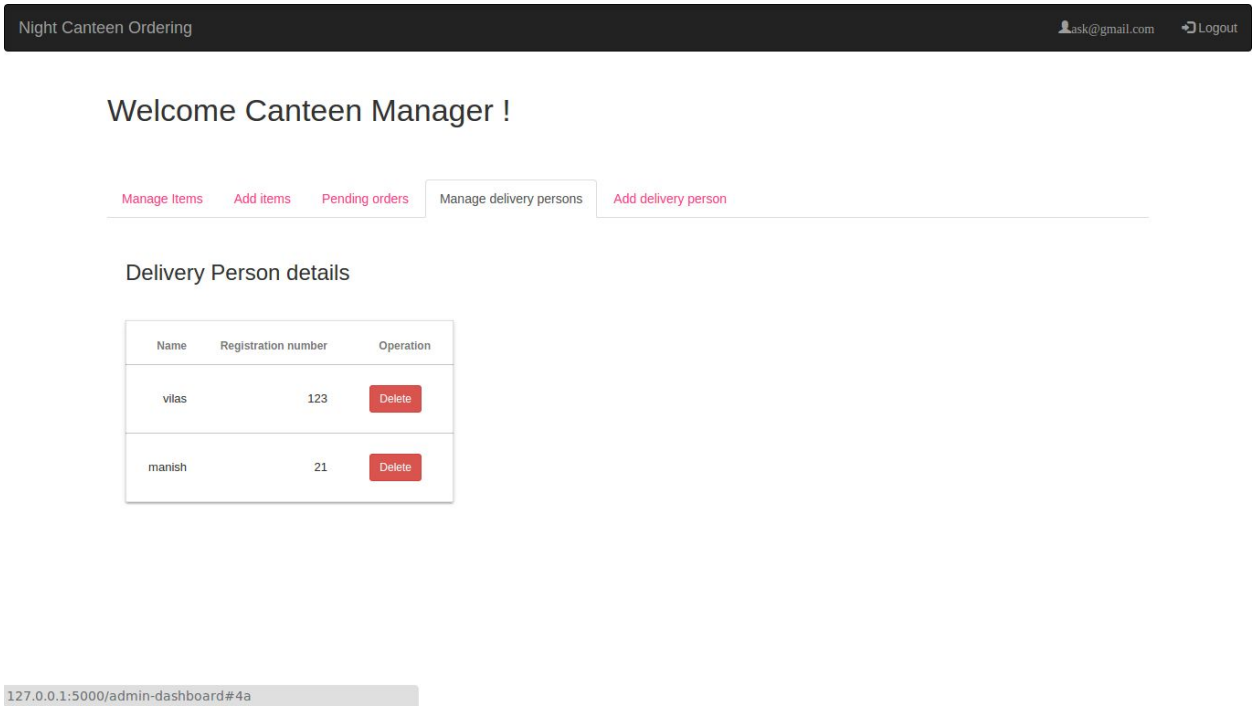
6) Admin View order details



7) Admin Add delivery Boy

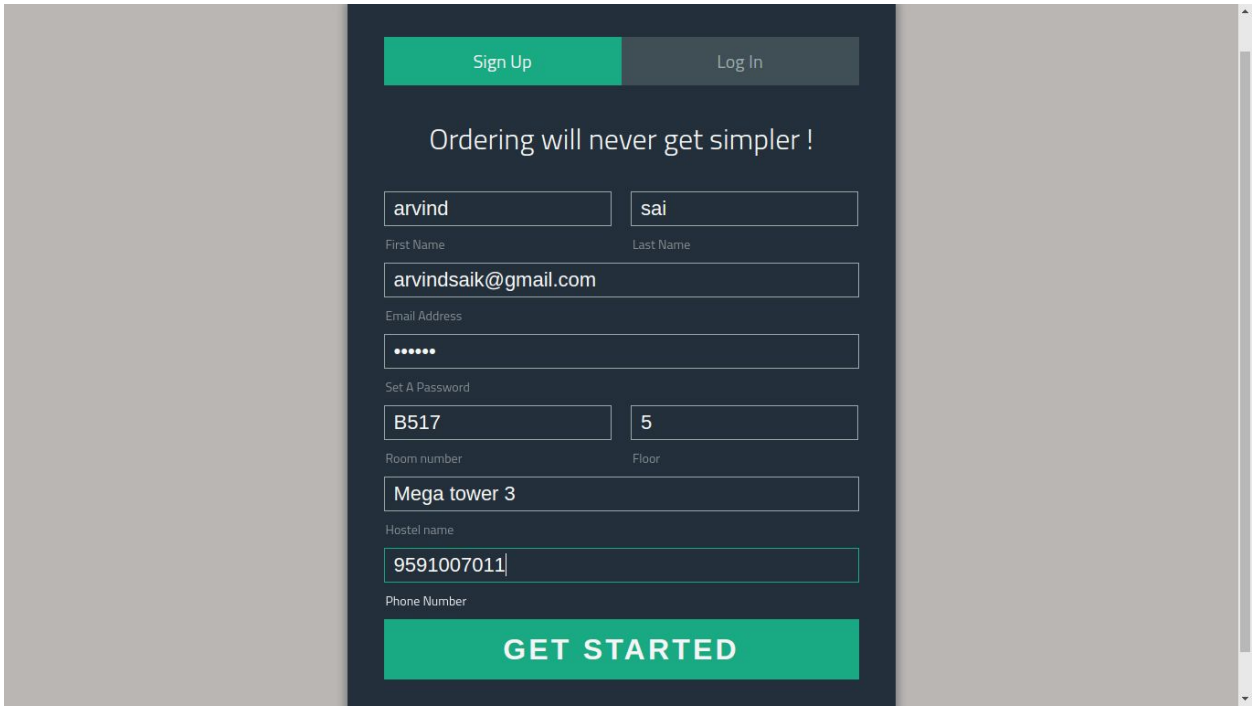


8) Admin Manage Delivery Boy



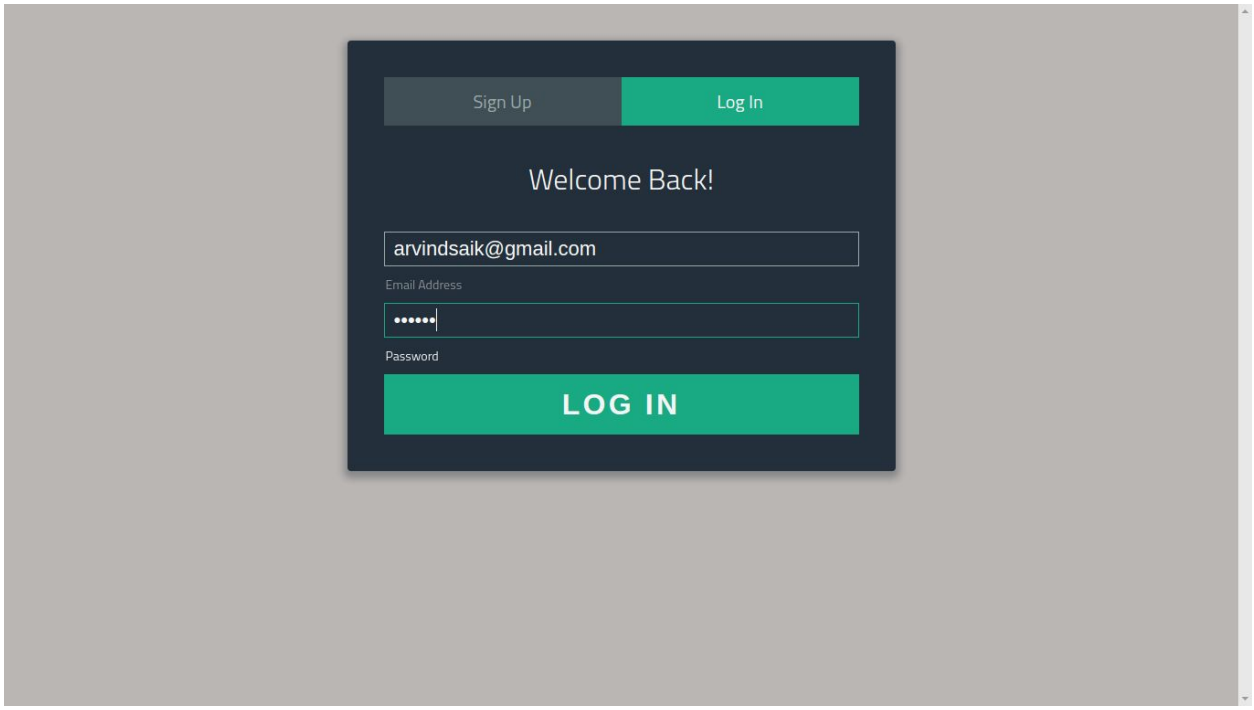
9) User Sign Up

User enters details to sign up.



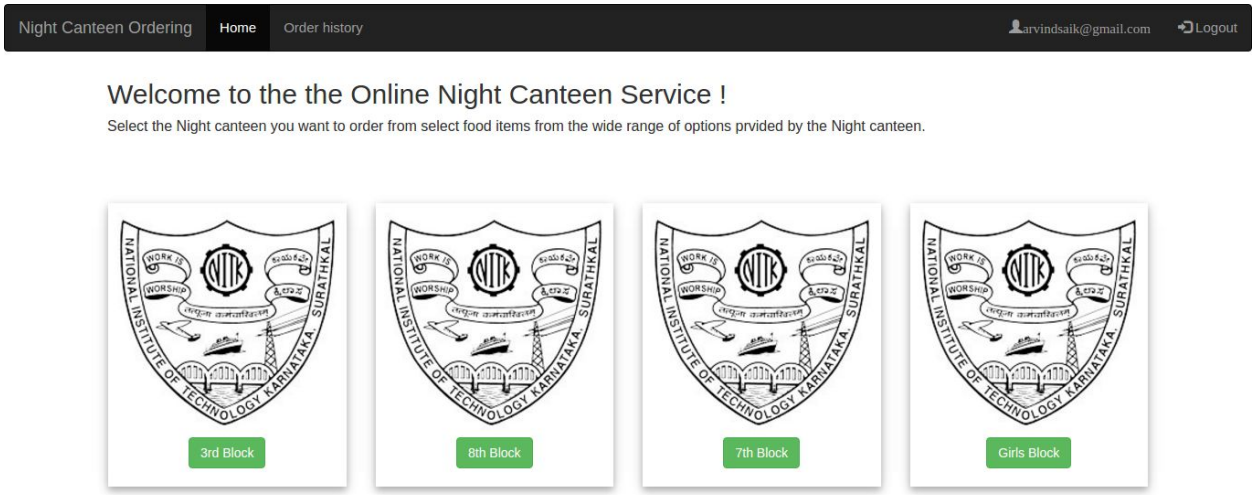
10) User Sign in

Sign in to the account with details given.



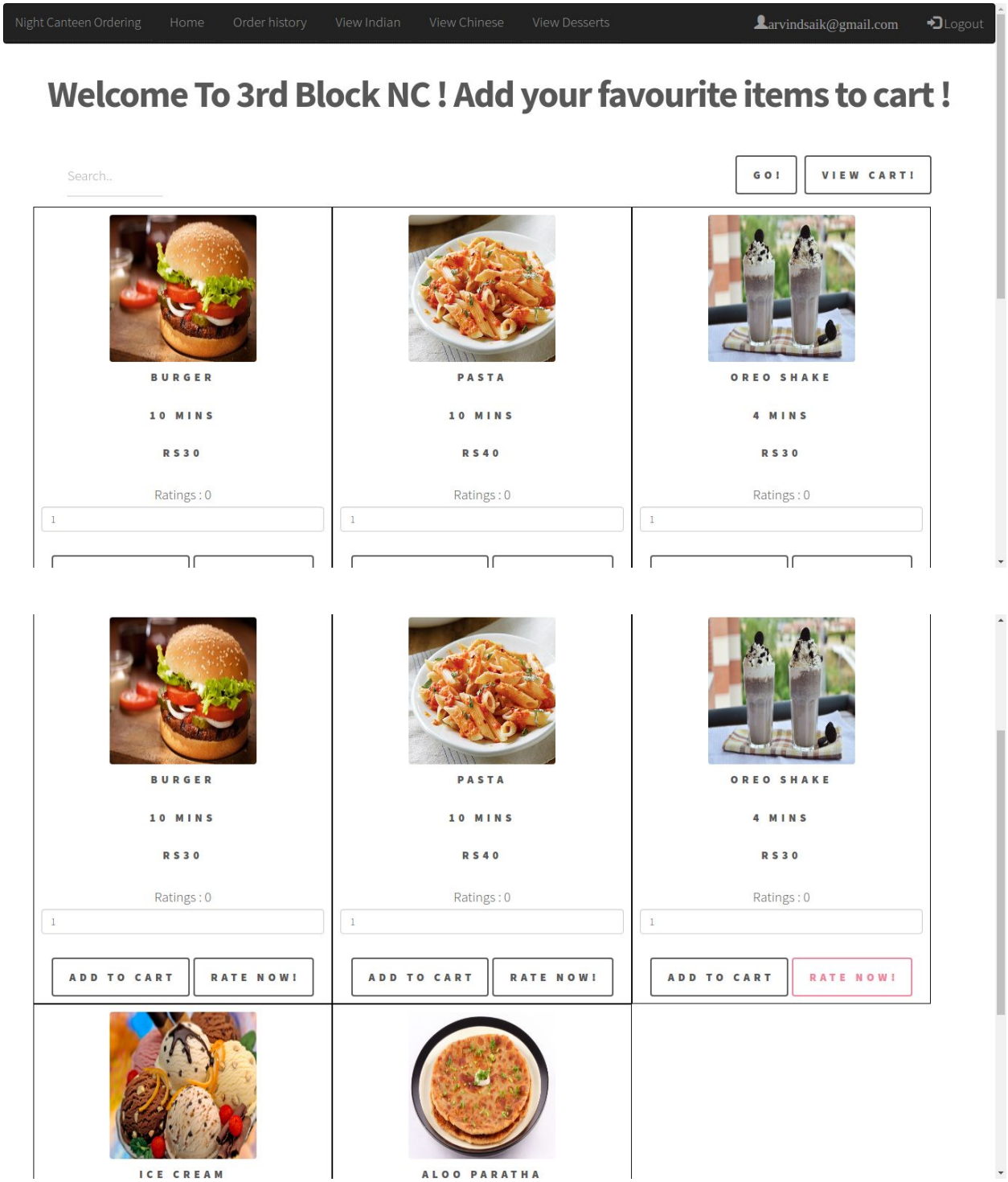
11) User homepage

Select the night canteen of choice.

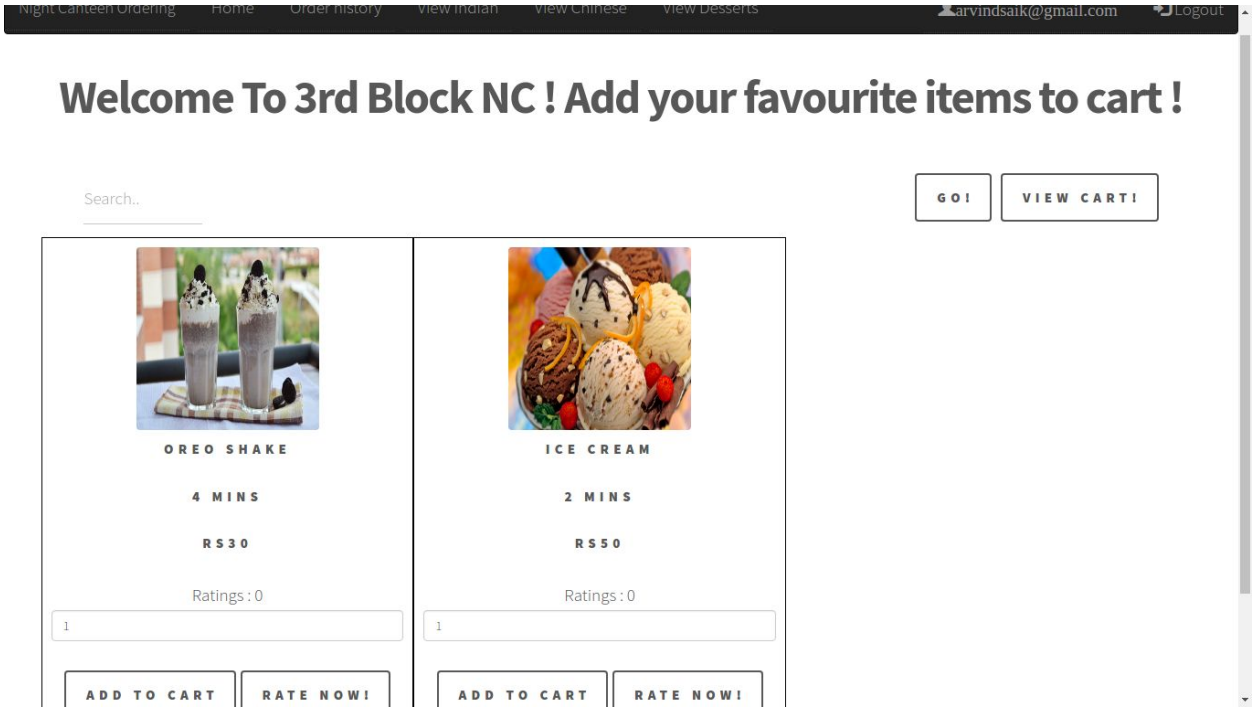


12) View items offered by a night canteen

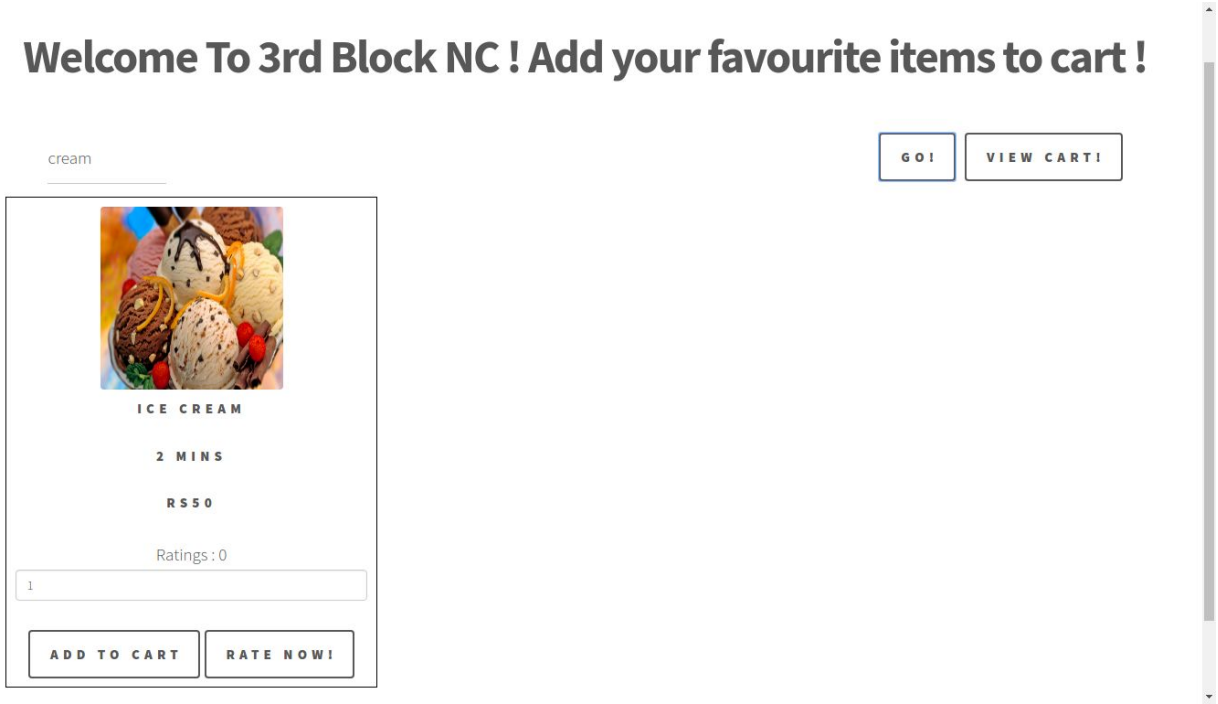
Add to cart/Rate from the wide variety of products available in the night canteen.



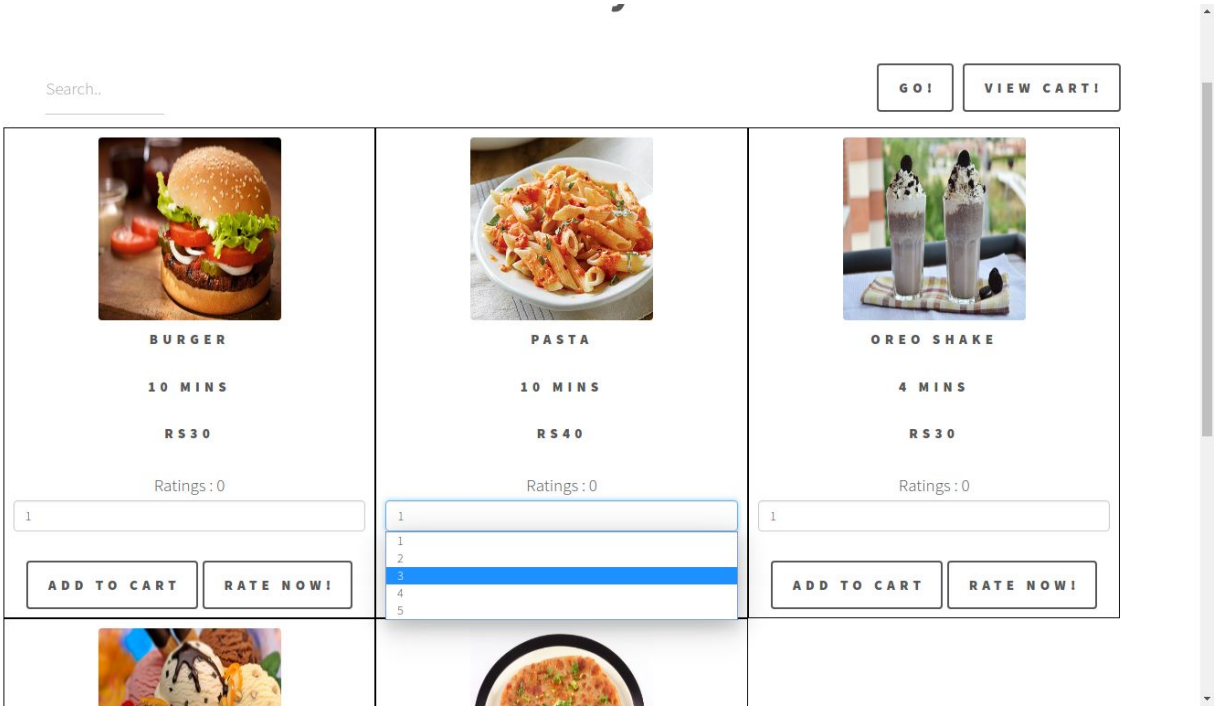
13) View by Category of food item by clicking on the menu in the top. (Desserts below)



14) View after searching

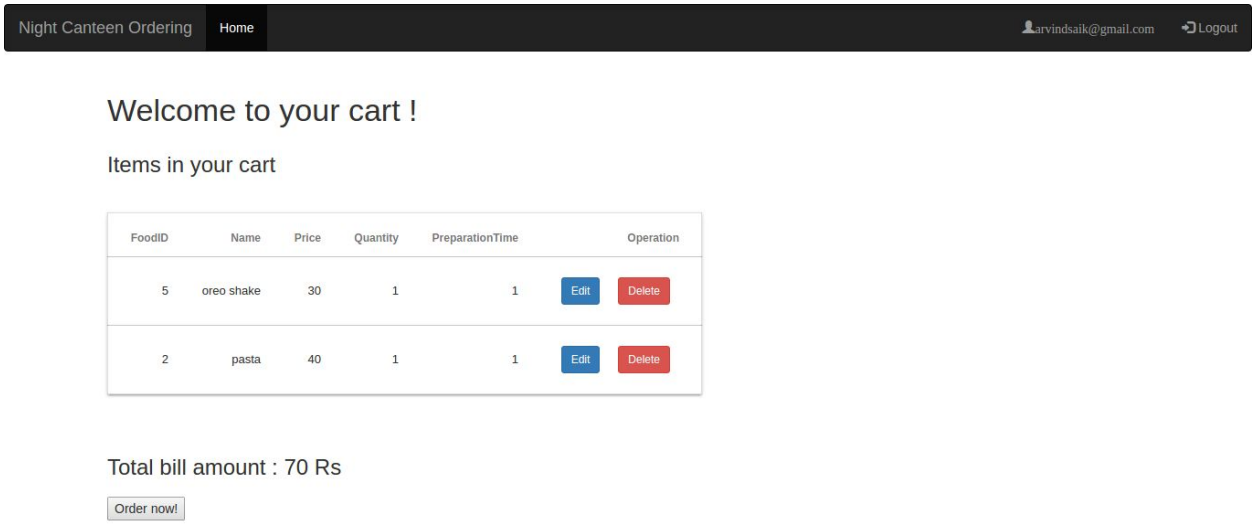


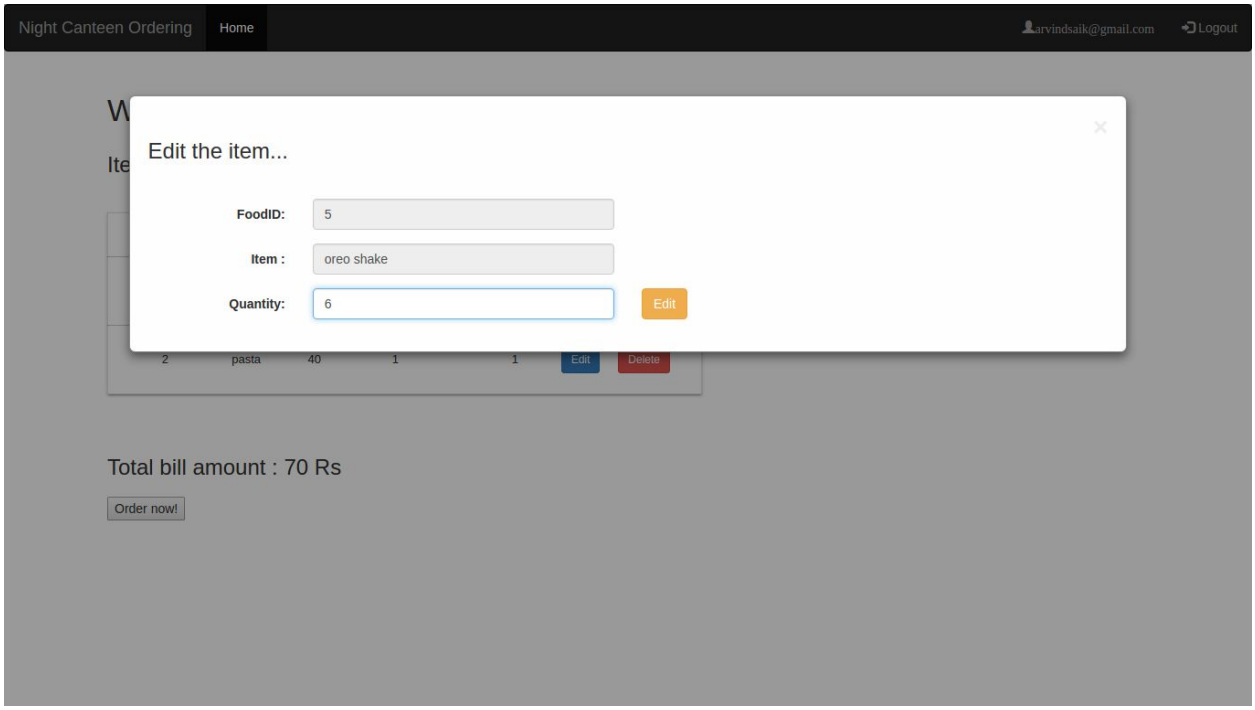
15) Rate item in the night canteen



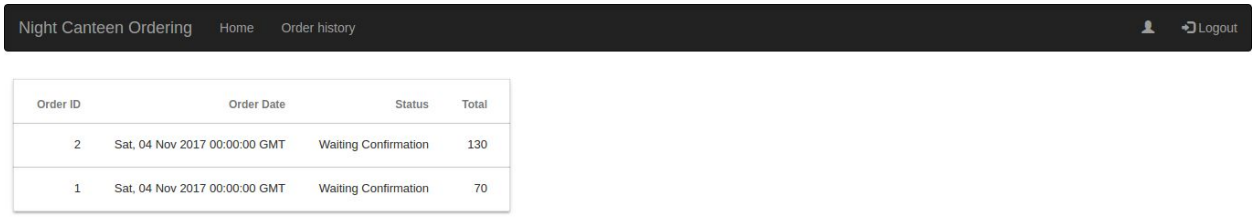
16) Student View Cart and place order

Users can delete and edit quantity of items here.





17) Order History of the user



18) Order History after acceptance of order