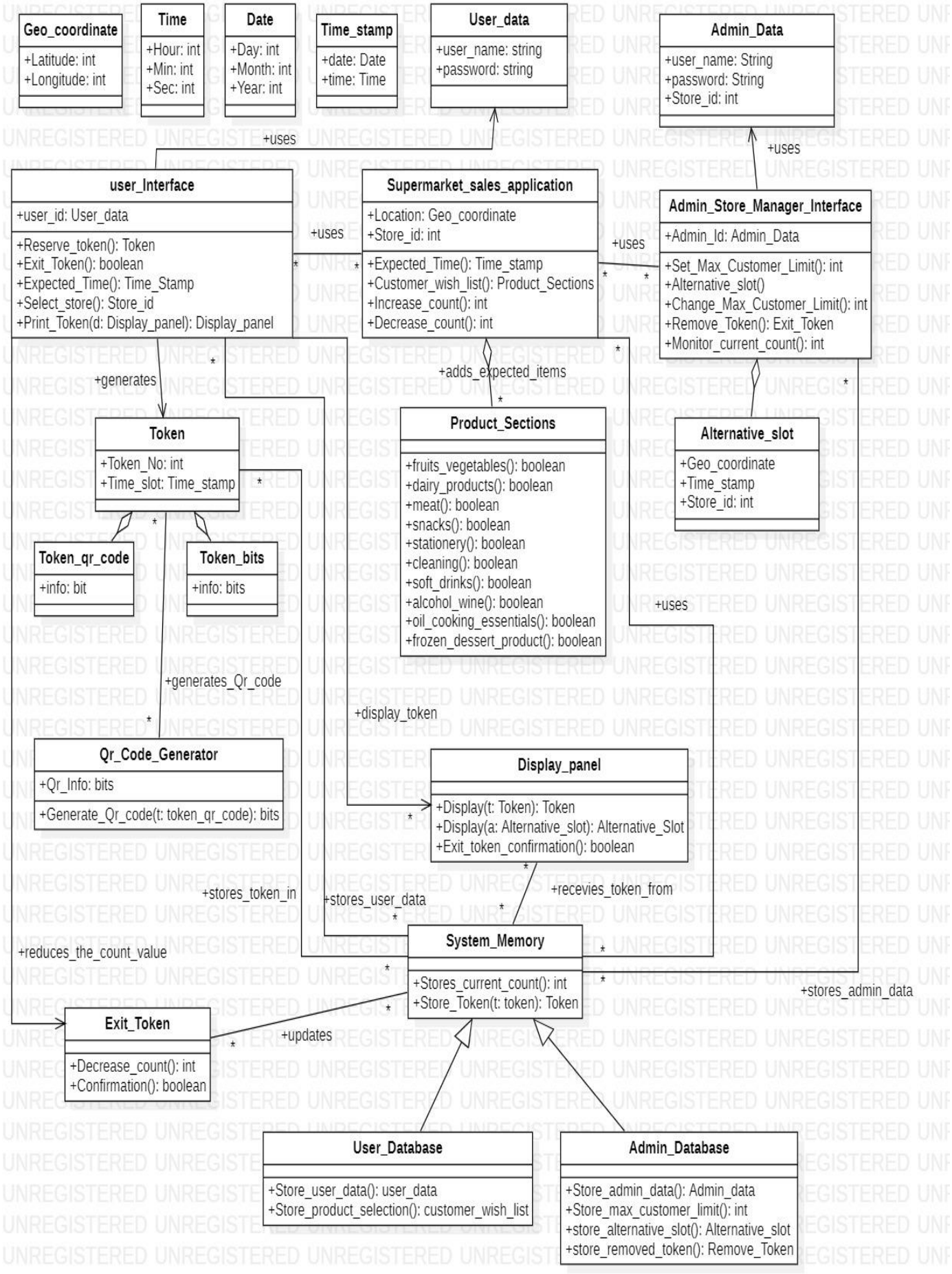
Clup UML diagram:



Components of class diagram:

- User
- User interface
- Supermarket sales application
  - Product sections
- Admin store manager interface
  - Alternative time slot
- Token
  - QR code generator
- System memory
  - User database
  - Admin database
- Display panel
- Exit token

Bullets representation:

- Main class
- Sub-class

User:

- In this application customer is a user. Who uses this application to form a virtual queue.

User interface:

- the user uses the user interface for doing specific operations. Such as (select store, enter expected time, enter customer product wish list, reserve token, print token).

Supermarket sales application:

- it has two attributes (store id, geometrical coordinates)
- four operations (customer wish list, expected time, increase count, decrease count).
- Counter helps to keep track of customer traffic inside the store.

Product selection:

- This class is the subclass for the supermarket sales application.
- It has operations that contain product sections, user can able to add expected items.

Admin store manager interface:

- Admin is the store manager, it contains admin id in the attributes.
- Admin can able to do the following operations.
- Can set the maximum customer limit allowable inside the store in a particular time slot.
- Can monitor the customer's count inside the store with the help of a counter.
- Can change the maximum customer limit, according to the influx of customers in the queue.
- Can allocate an alternative time slot if necessary.
- Can remove the token in the case of malfunctions, this operation will be discussed in the exit token.

Alternative time slot:

- It is the subclass to the admin store manager interface.
- It contains geometrical coordinates of the store, alternative time slot, store id.

Token:

- The token contains token no, a time slot in the attribute.
- It invokes QR code from QR code generator and stores it in system memory.

QR code generator:

- This class generates the QR code which is combined with the token number while printing the token.

System memory:

- System memory is the internal memory that is used by the system to store the data of the application.
- It stores (current count, token).
- It has two subclasses such as (user database, admin database).
- User database stores user data.
- Admin database stores admin data.

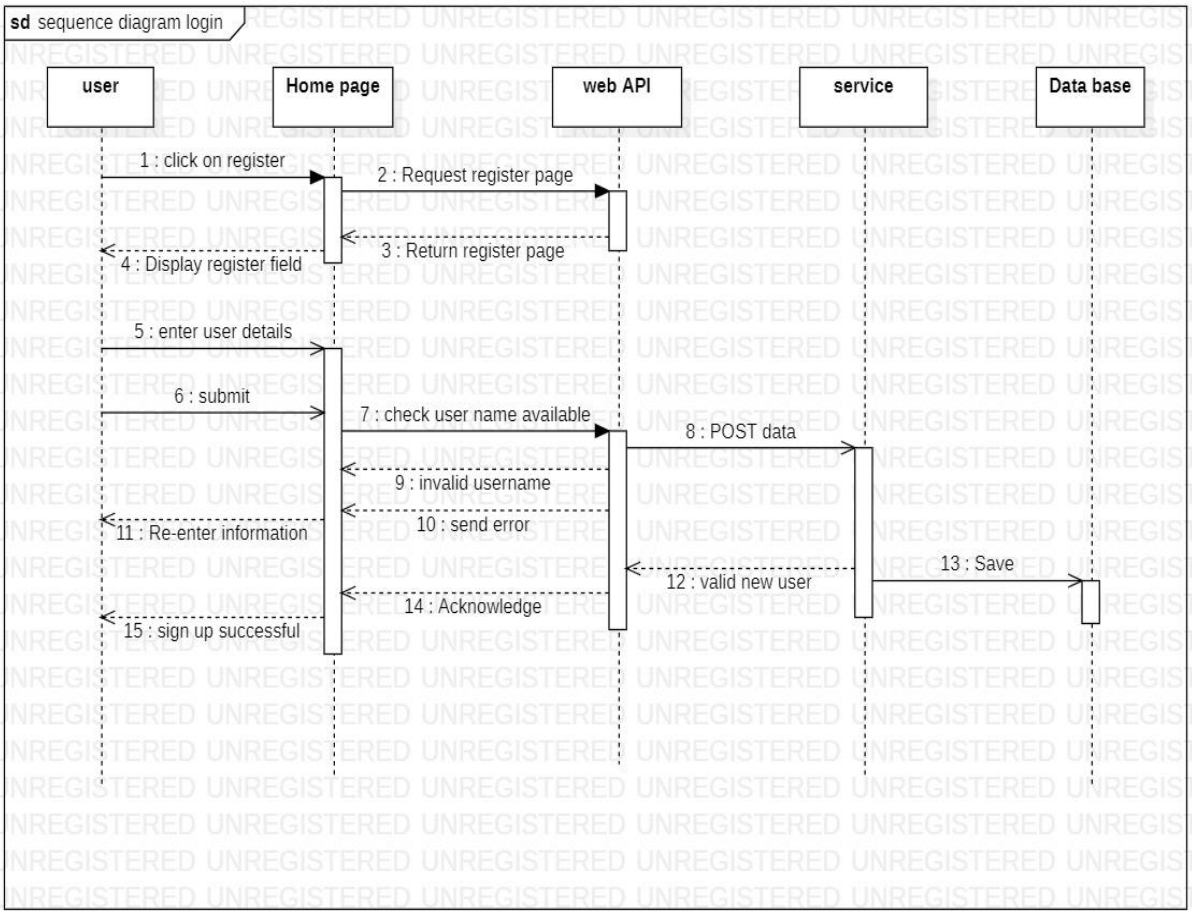
Display panel:

- The display panel performs three operations.
- It can print and display tokens regarding the request of the user interface.
- It can display the alternative available time slot to the user.
- It can display the confirmation message of an exit token.

Exit token:

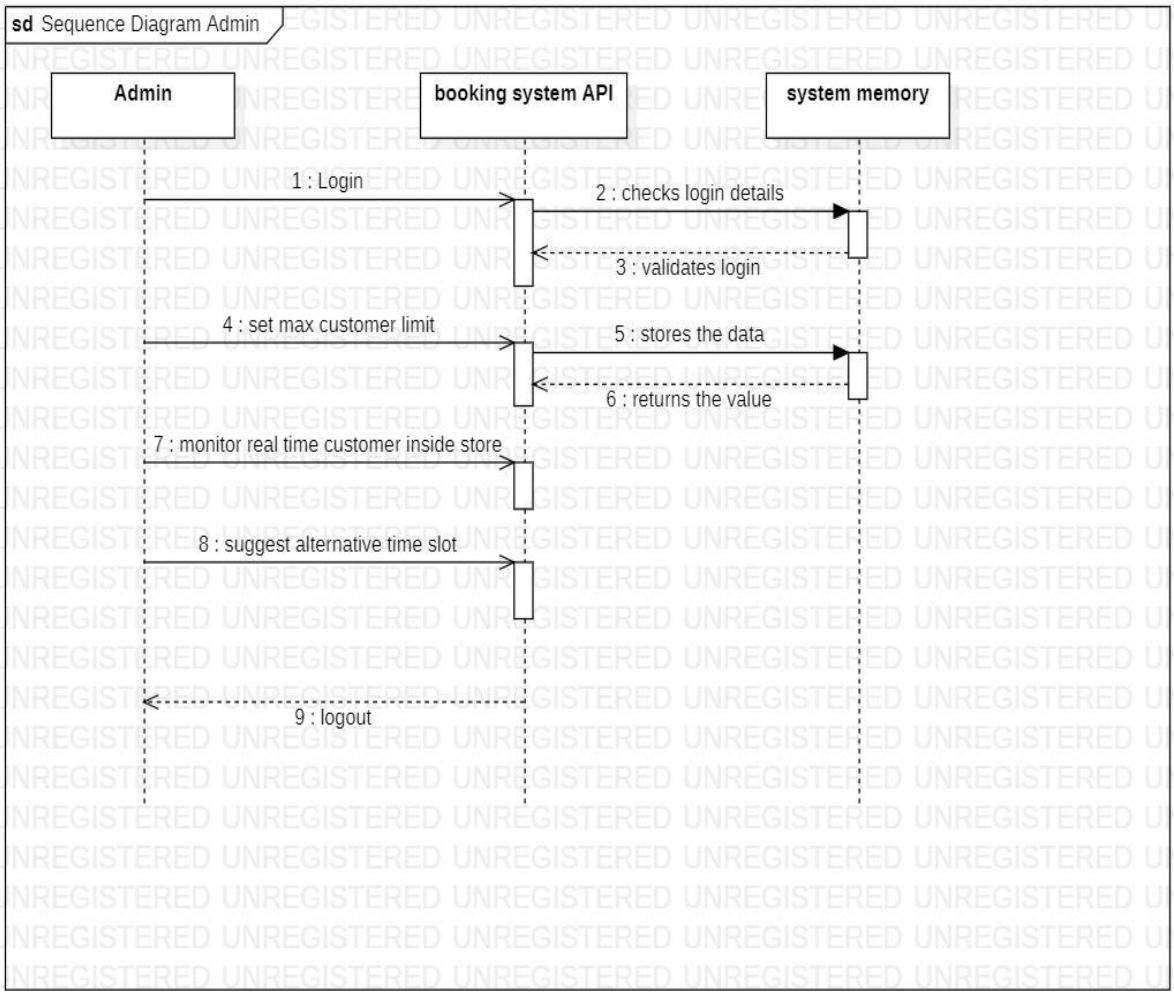
- This class is used to monitor the real-time customer present inside the supermarket.
- When the customer performs the exit token, the counter can allow the next customer inside the store.
- This sequence helps the admin to monitor the customer's maximum capacity inside the store.
- As a precaution we have included the confirmation message in the display, to prevent the accidental performance of exit token.
- If the customer forgets to perform the exit action, the admin will remove that particular token by performing the remove token action. This operation is included for safety purposes.

Sequence diagram login



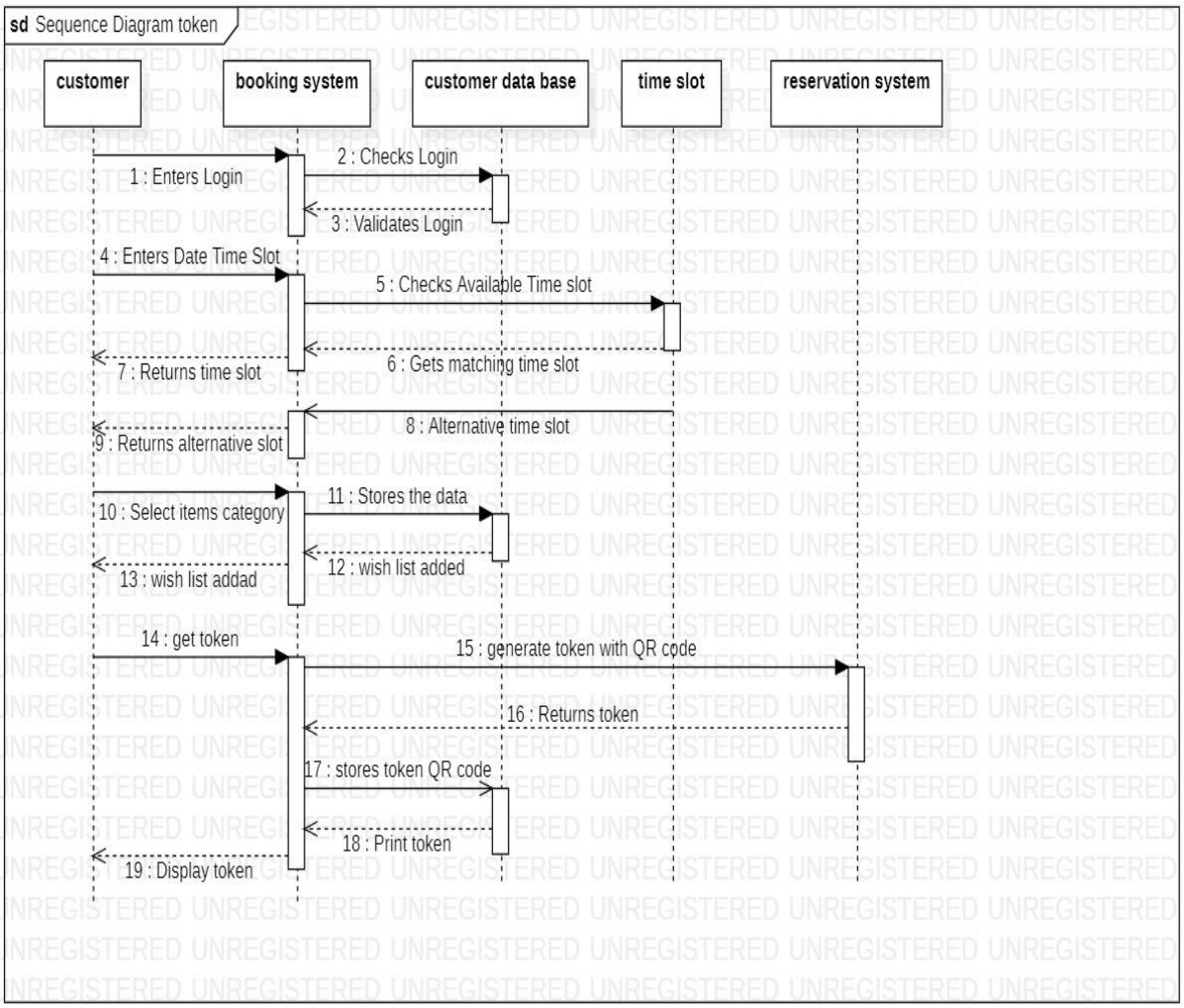
- User request for registration on the home page.
- The user enters their user details on the home page.
- Confirms their details by clicking the submit button.
- Username availability is checked in web API.
- If the user gets an available username, then the user posts that valid data in the service.
- Finally, the user saves their data by storing it in the database.
- If the user gets an invalid username, the web API sends an error message to the home page.
- Again, the user re-enters signup credentials.
- The end-user gets the signup successful message on their home page for their confirmation.

Sequence diagram admin:



- The store manager (admin) inserts the login credentials into the booking system application.
- The admin login credentials are validated through system memory.
- The admin can now add alternative timeslots.
- The admin can set the maximum customer limit into the application and send the entire store info (store id, store location, timeslots).

Sequence diagram for booking token:

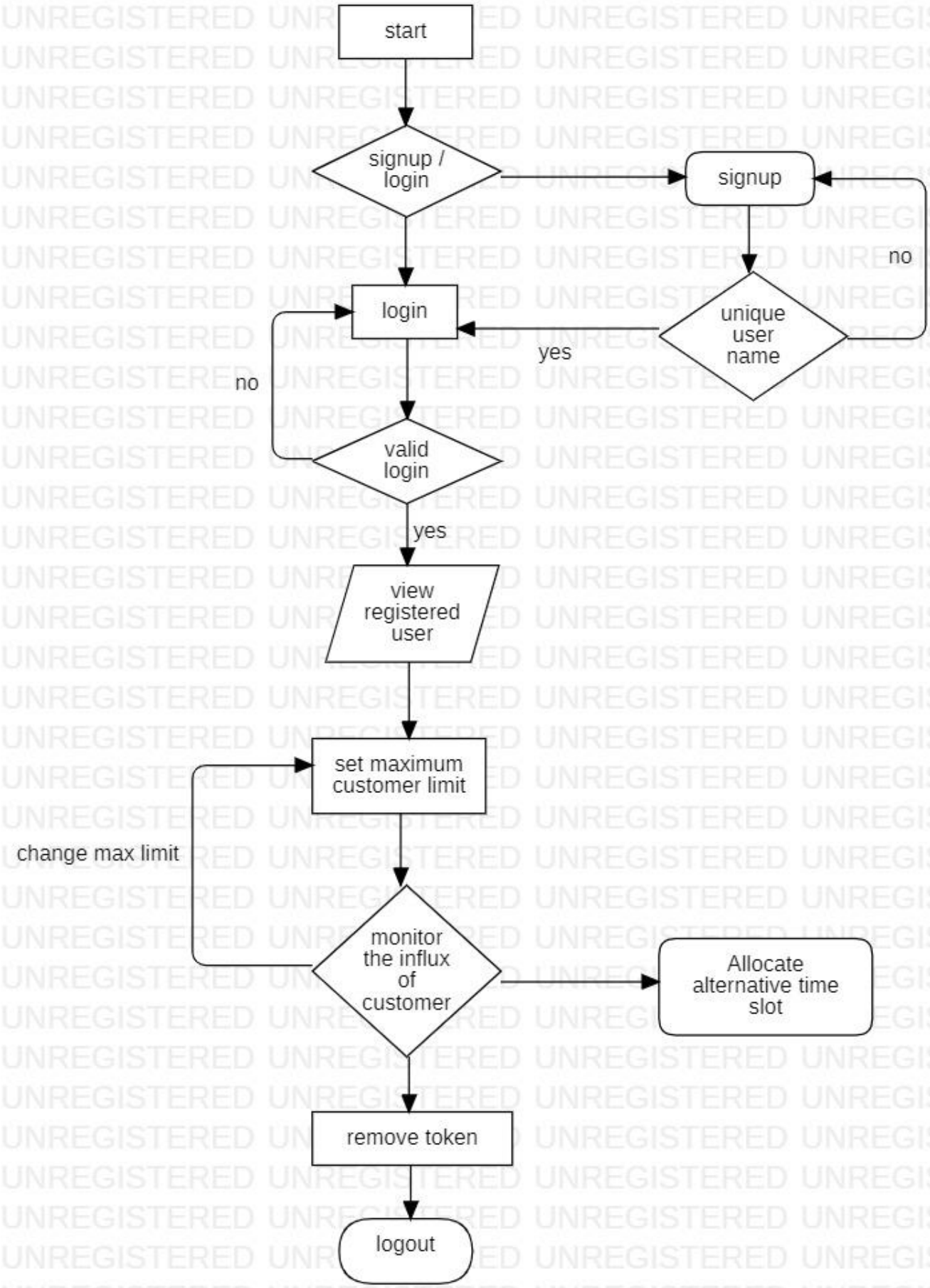


- User(customer) enters their login credentials in the booking system.
- The booking system validates the login credentials by referring them to the customer database.
- The user enters the expected time and date in the booking system.
- Users will get a matching time slot when there is a free time slot available for that particular time.
- Otherwise, the booking system returns the alternative time slot.
- The user selects the category of the expected item in the booking system.
- Booking system stores that data in the customer database.
- Finally, the user clicks the get token to generate the token.
- The booking system generates the token with a QR code and stores it in the customer database.
- Booking system prints the token and displays it to the user.

Flow Chart Diagram:

A flow chart is another important diagram to describe the dynamic aspects of the system. It is a flowchart to represent the flow from one activity to another activity. The activity can be described as an operation of the system. The control flow is drawn from one operation to another. There are two types of users in our application. One is a customer and another is an admin

Flow chart diagram admin:



Flow chart diagram customer: