RECOMMENDATION SYSTEM FOR RESTAURANT PLATFORM

Acknowledgement:

First and foremost, we want to thank our prof.Helal Ahmed, for his unwavering support, excellent guidance, and encouragement throughout our graduation process. Since the start of our project, he has put in a lot of time and work. Over the years, for their support, patience.

Finally, thanks for our faculty for providing the suitable environment that led us to represent the best image that computer science graduates of Helwan University are supposed to represent

Abstract:

Our system is an online food ordering service in Egypt. We offer the quickest, easiest, most reliable food ordering experience. Our website helps customers find restaurants in their area, filter by cuisine, browse menus, and place their orders. Customers can enjoy our service through our website and it will help millions of Egyptians order their food in 30 seconds or less. Our customers will enjoy exclusive offers from thousands of restaurants in more than 25 cities in Egypt.

Chapter 1: Introduction

Overview:

The world is now turning to technology and facilitating communication through the use of the Internet. Therefore, we developed this site to help customers choose and order food from their favorite restaurants, in addition to recommending restaurants or meals similar to their interests based on their previous search. This helps groups to choose from different restaurants at the same time.

On the other hand, the site helps restaurants to reduce crowding in the halls, especially in light of the epidemics spread in the recent period.

-By using the recommendation system, the site facilitates the selection of restaurants for the customer

The Recommendation system is the unavoidable thing for whatever we buy or go to the new place. Restaurants also need recommendation systems in terms of attracting more customers in the management side and tasting favorite, famous food in the restaurant in customers side. In reality finding the favorite food and famous food especially in new area is a challenging task.

In this paper, we present the recommendation system for restaurants based on food rating distribution, service rating distribution by calculating the matrix density. With addition to that we build the popularity based recommender model for recommending restaurants to the customers. Ranking scheme can be employed based on scores. The output of the model may be recommending most popular restaurants and most popular food items served by the appropriate restaurant

Objectives:

- The site displays popular restaurants near the user based on his current location.
- The user creates an account on the site.
- The site stores user data in database.
- The site displays results based on the user's preferred sections.
- The site displays results based on the user's search.
- The site displays results based on the user's geographical location.
- Restaurant owners can add a profile for their restaurants on the site.
- The user can add his favorite restaurants to his favourites.
- The user can browse the restaurants he wants and see what the restaurant offers and its menu.
- Restaurant owners and users can edit their profiles adding or deleting or updating information related to them.
- Restaurant owners and users can also delete their profiles.
- Admin can manage the site.

Purpose:

- Helping restaurant owners reduce pressure on restaurant halls.
- Increasing the restaurant's profits due to the increase in customers.
- Facilitate customer communication with restaurants.
- Enables customers to browse the app and place orders for the food they select from the specific restaurants.
- Saving customers time and effort.
- Provide a clear sales channel for restaurants.
- Facilitate the buying and selling process.
- Enable Restaurants to receive reviews and rating.

Scope:

Recommendation system for restaurant platform is a web application that is used by customers or restaurant owners to help them get what they need.

Customer can request his order through that application and browsing his favorite restaurants from anywhere he wants.

Restaurant owners can display their menu and the services they provide to customers so that they can increase their profits, deal with more customers than usual, and expand the scope of their dealings; As they will not only deal with customers who go to the restaurant headquarters, but will expand their scope to customers who want to make an order from the restaurant without going to the place.

It also help restaurants to know the opinions of customers about their service and what they offer

Constraints:

Technical Constraints:

It took us a great effort to see the appropriate technology for our application so that it is built correctly and appropriately, and made us try several options available within web technologies, and they were all tested until the appropriate and best for this application was settled, and we changed the structure of the application from a technical point of view, that is why it took a lot of time to reach the current point.

General Constraints:

Time: The time factor was very important to us until we finish the application as we wanted, so if we have more time, the application will certainly be terminated in a more comprehensive and complete way than the one that has been completed.

Scope: The scope was not clear enough at first to complete the tasks.

Data: collecting raw data for simulation was not easy to access.

Chapter 2: Project Planning and Analysis

2.1 Project planning:

2.1.1 Feasibility Study:

Technical feasibility:

Technical feasibility assesses the current resources (such as hardware and software) and technology, which are required to accomplish user requirements in the software with in the allocated time and budget. For this, the software development team ascertains whether the current resources and technology can be upgraded or added in the software to accomplish specified user requirements. Technical feasibility also performs the following tasks:

Analyzes the technical skills and capabilities of the software development team members.

Determines whether the relevant technology is stable and established.

Ascertains that the technology chosen for software development has a large number of users so that they can be consulted when problems arise or improvements are required.

Economic feasibility:

Economic Feasibility determines whether the required software is capable of generating financial gains for an organization. It involves the cost incurred on the software development team, estimated cost of hardware and software, cost of performing feasibility study and so on.

For this, it is essential to consider expenses made on purchases (such as hardware purchase) and activities required to carry out software development.

In addition, it is necessary to consider the benefits that can be achieved by developing the software.

Software is said to be economically feasible if it focuses on the issues listed below.

Cost incurred on software development to produce long-term gains for an organization.

Cost required to conduct full software investigation (such as requirements elicitation and requirements analysis).

Cost of hardware, software, development team and training.

Operational feasibility:

Operational feasibility assesses the extent to which the required software performs a series of steps to solve business problem and user requirements. This feasibility is dependent in human resources (software development team) and involves visualizing whether the software will operate after it is developed and be operative once it is installed.

Operational feasibility also performs the following tasks:

Determines whether the problems anticipated in user requirements are of high priority.

Determines whether the solution suggested by the software development team is acceptable.

Analyzes whether users will adapt to a new software.

Determines whether the organization is satisfied by the alternative solutions proposed by the software development team.

2.1.2 Estimated Cost:

Estimated cost is the projection of the amount of costs that will be incurred to build a product or construct something. This amount is derived as part of the capital budgeting process for an internal project, or as part of a sales bid when attempting to sell to a customer.

The party issuing the estimated cost may be held to the amount of the projection under the terms of a fixed price contract.

The expected costs of this project are divided into several parts, such as the costs of those who design the plans, the costs of those who design the application interface, and also the costs of those who develop and build the project.

2.1.3 Gantt Chart:

A Gantt chart is a commonly used graphical depiction of a project schedule. It's a type of bar chart showing the start and finish dates of a project's elements such as resources, planning and dependencies.

During our journey until we build the application, we divided the application building process into several stages and at different time periods, and certain tasks were divided in each period of them until we built the application in an easy and smooth manner.

Therefore, the following Gantt chart shows what was done during the construction and planning period of the project until it reached a point The end where it shows the length of time between all those tasks or even the delay of part of the tasks during any period.

2.2 Analysis and Limitation:

The main limitations of the application is that the order may take a lot of time to be delivered to the user as a result of poor communication on the Internet, traffic jams, bad weather.

Food may get cold due to the long ordering distances or bad traffic, user food may also be cold once it is finally delivered to his home.

He / She need to reheat it or eat it cold. The quality of the food served is often worse than eating at a restaurant.

2.3 Need for the new system:

This application is a direct competition to some of the famous applications, for example TALABAT

This system does the same as the new system, but it does not combine all the features of this application. TALABAT combine all what a user want to order online as food, drugs, House supplies but this system limited to food from restaurants. It has a dashboard for the owners of the restaurants to manage their pages in the application. The new system also take a percent from each restaurant the user make an order from. The new system is better and easier than TALABAT through web site.

2.4 Analysis for the new system:

2.4.1 User Requirements:

a. User as a customer:

The online ordering system must be quick and easy to navigate in addition to providing useful features for browsing, selecting and purchasing products. Required Customer interface features:

- Navigation.
- Create customer account.
- Manage customer account.
- Browse meals details.
- Add items to cart.
- Manage items in cart (remove, add, or customize).
- Provide payment and delivery information.
- Place order.
- Receive order confirmation and receipt.
- Track package/delivery time for in store pick up.

a. User as a restaurant owner:

Required Restaurant Owner interface features:

- Create Owner account.
- Manage Owner account (edit, delete, add).
- Browse meals details.
- Manage meals details.

2.4.2 System Requirements:

The Recommendation System for Restaurant is a site works to do the work in the software environment easy by many features, these features meet the need of the customers and restaurant owners by making both of them make an account in the site and browse for what they want, customers for their orders they want to make from a specific restaurant or restaurants, owners for managing their pages in the site and shows what is offered by their restaurants.

2.4.3 Domain Requirements:

- The users must have an account in the site to be able to deal with the site.
- A big database must be used for that site.

2.4.4 Functional Requirements:

1) Customer requirements:

a. **Registration:** Customer should register to system to be able to login.

b. **Log In:** Customers can log in by entering user name and password and manage their work on website.

c. **Update information:** Customers can change any of their information any time.

d. **Search:** Customer can search for restaurants or items he/she want.

e. **View Restaurant:** Customer can view restaurant information like information about restaurant, reviews and offers also can view restaurant menu as a list of all types of food the restaurant is dealing with the available themes.

f. **Manage shopping cart:** Customer can select food items from menu, add the desired food items to the cart and remove item from the cart.

g. **Pay for order:** The customer pays for the items that he has chosen and placed in the shopping cart.

h. **View Order Status**: Customer can check the status of his/her placed order.

i. **Receive confirmation:** After the customer requests his order, he waits until he receives approval from the restaurant for his request and gets the confirmation against that order in the form of order no.

j. **Log out:** After customer finish using the site, he/she can log out from it.

2) Restaurant owner requirements:

a. **Registration:** Restaurant owners should register to system to be able to login.

b. **Log In:** Restaurant owners can log in by entering user name and password and manage their work on website.

c. **Update information:** Restaurant owners can change any of their information any time such as update menu, update restaurant information (location, new branches, and communication info.) and update offers.

d. **Manage food Menu:** Restaurant Owner can insert, update and delete the food items from the menu list.

e. **Manage recorded Orders (accept/reject):** Restaurant owner can accept or reject customers' orders.

f. **View Orders:** Restaurant owner can view the placed order and delivered orders.

2 **Log out:** After owner finish using the site, he/she can log out from it.

3) Admin requirements:

a. **Registration:** Admin should register to system to be able to login.

b. **Log In:** Admin can log in by entering user name and password and manage his/her work on website.

c. **Update information:** Admin can change any of his/her information any time.

d. **Manage users' profiles (customer/owner):** Admin can delete user's profile who violates system's constraints, and view user's profile.

e. **View orders:** Admin can view all orders happened between customer and restaurant owner.

f. **Log out:** After admin finish using the site, he/she can log out from it.

2.4.5 Non-Functional Requirements:

Availability: Our site available in any time to use and it always updated.

Performance: The Performance is very high to match with the features which it offered by the site.

Maintainability: The site can be able to adept with any changes occur.

Capacity: Unlimited user can concurrently use it.

Security: The site is very safe from any attacks and the only authorized users can gain access.

Usability: Our site is easy to use because it is like many applications with new features.

2.5 Advantages of the new system:

- Easy, fast and comfortable for the user: customers and restaurant owners.
- User Monitor his expenses incurred in real-time.
- The system can reach more customers.
- The customer has a lot of choices to choose from without going any place.
- Easy reorder for the customer.
- Increase the sales of restaurant owners.

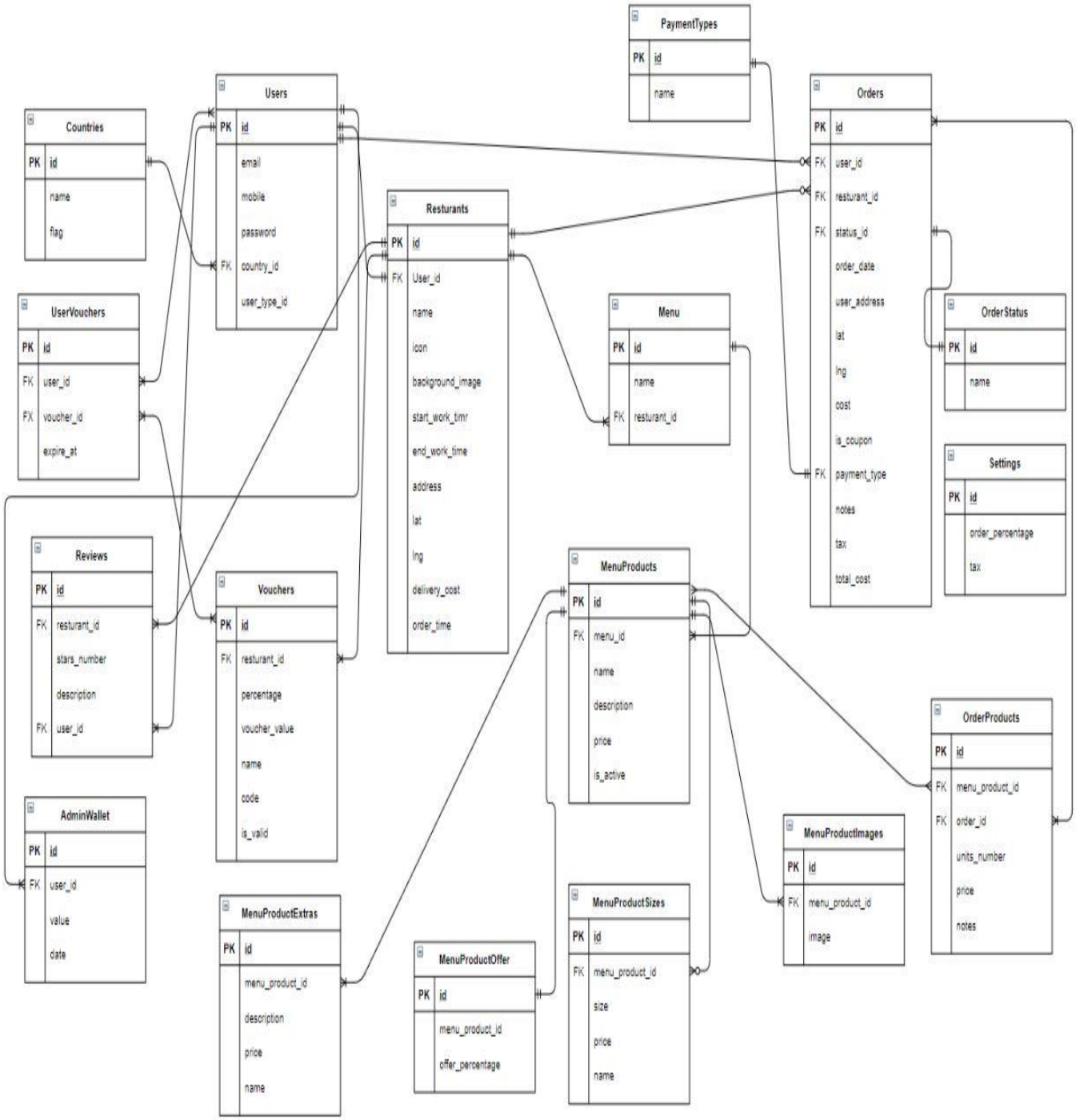
2.6 Risk and Risk Managements:

We expected to face some problems during the projects, so we list some of these problems (risks) and built a risk management plan to avoid any failure.

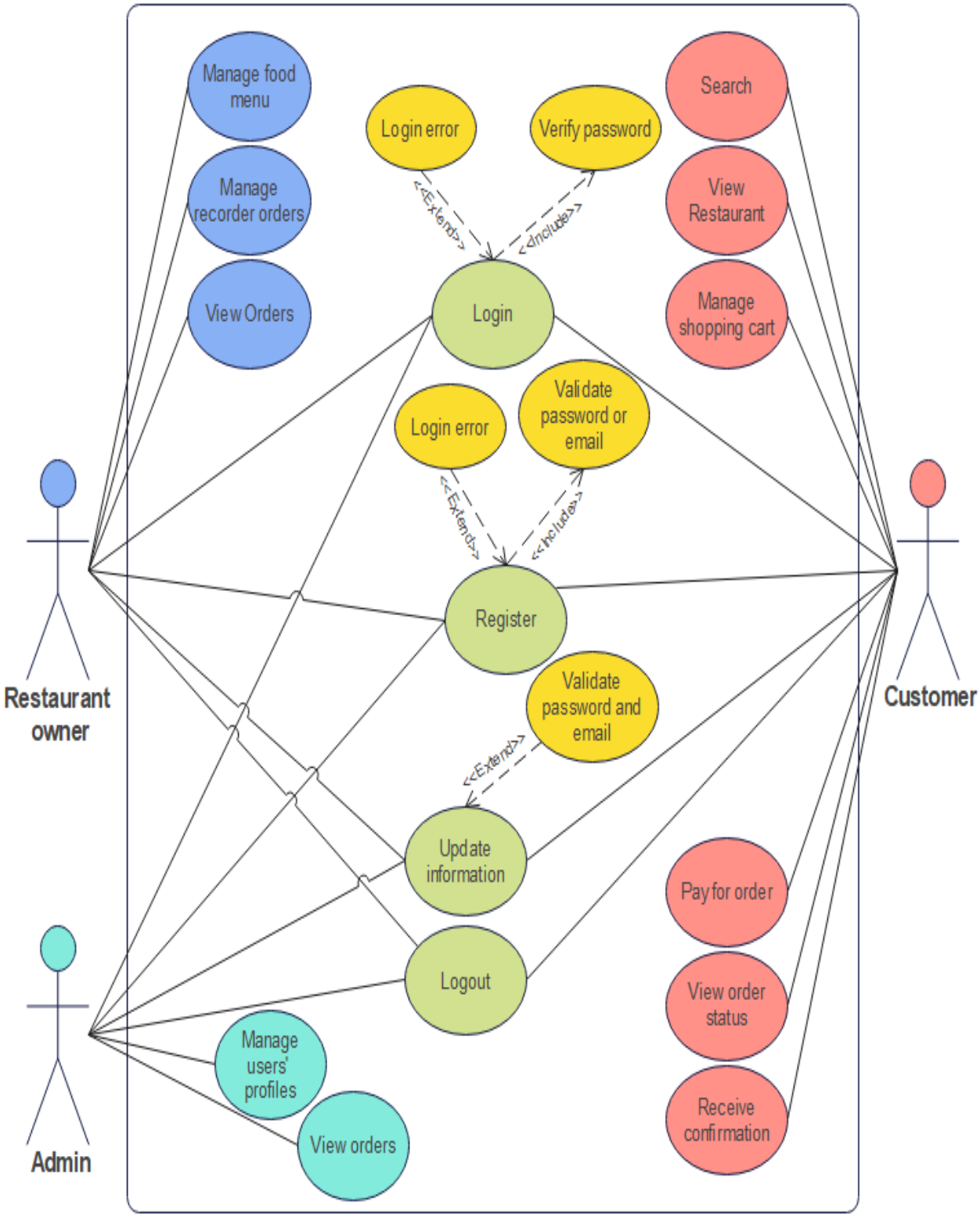
Some of these risks that we expected lack of time to learn new technologies and new features which takes many times.

Chapter 3: Software Design

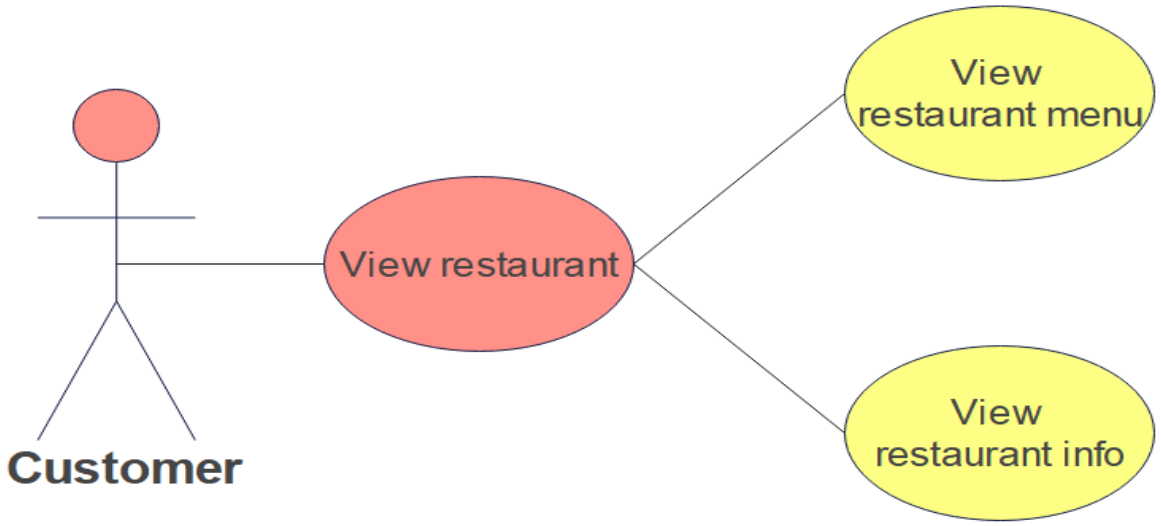
3.1 Design of database (ERD) Diagram:



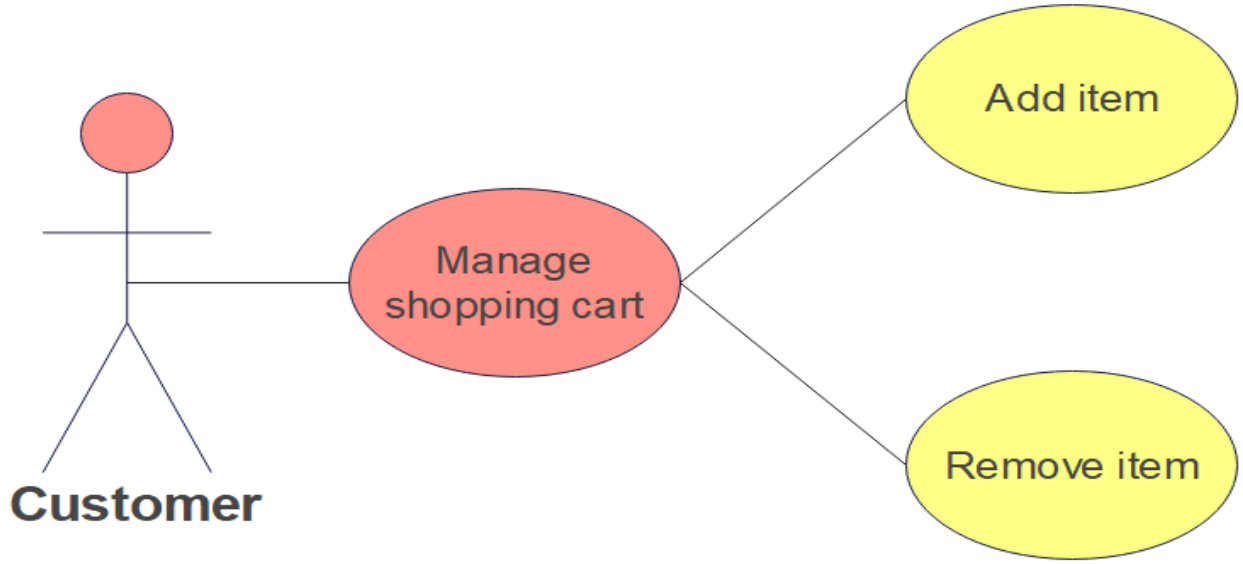
3.2 Use case diagram:



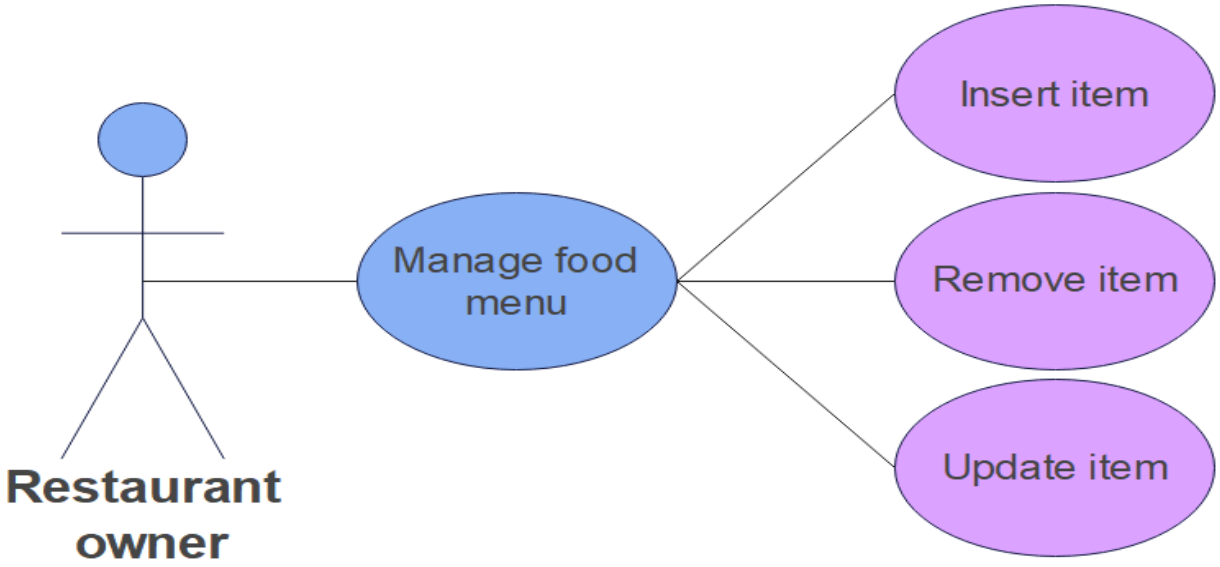
Customer view restaurant:



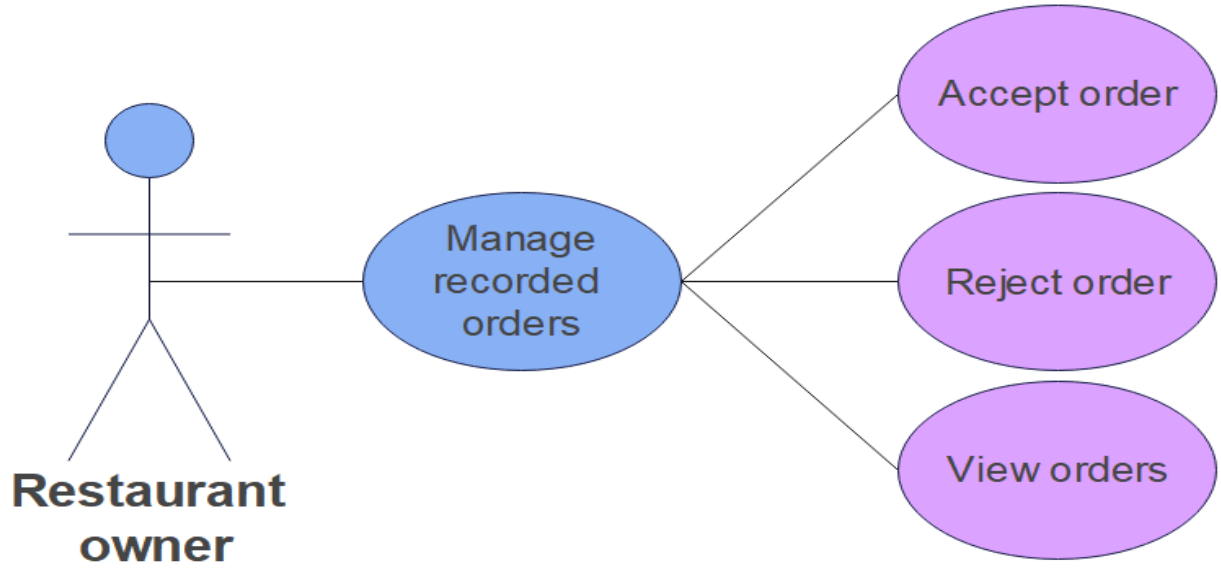
Customer manage shopping cart:



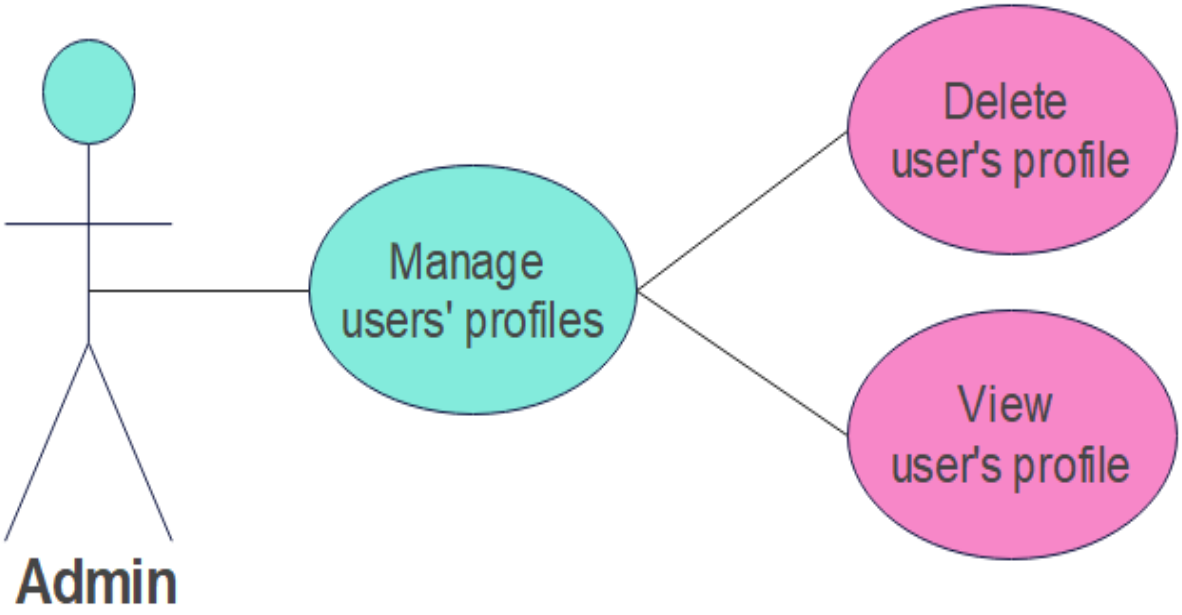
Restaurant owner manage food menu:



Restaurant owner manage recorded orders:



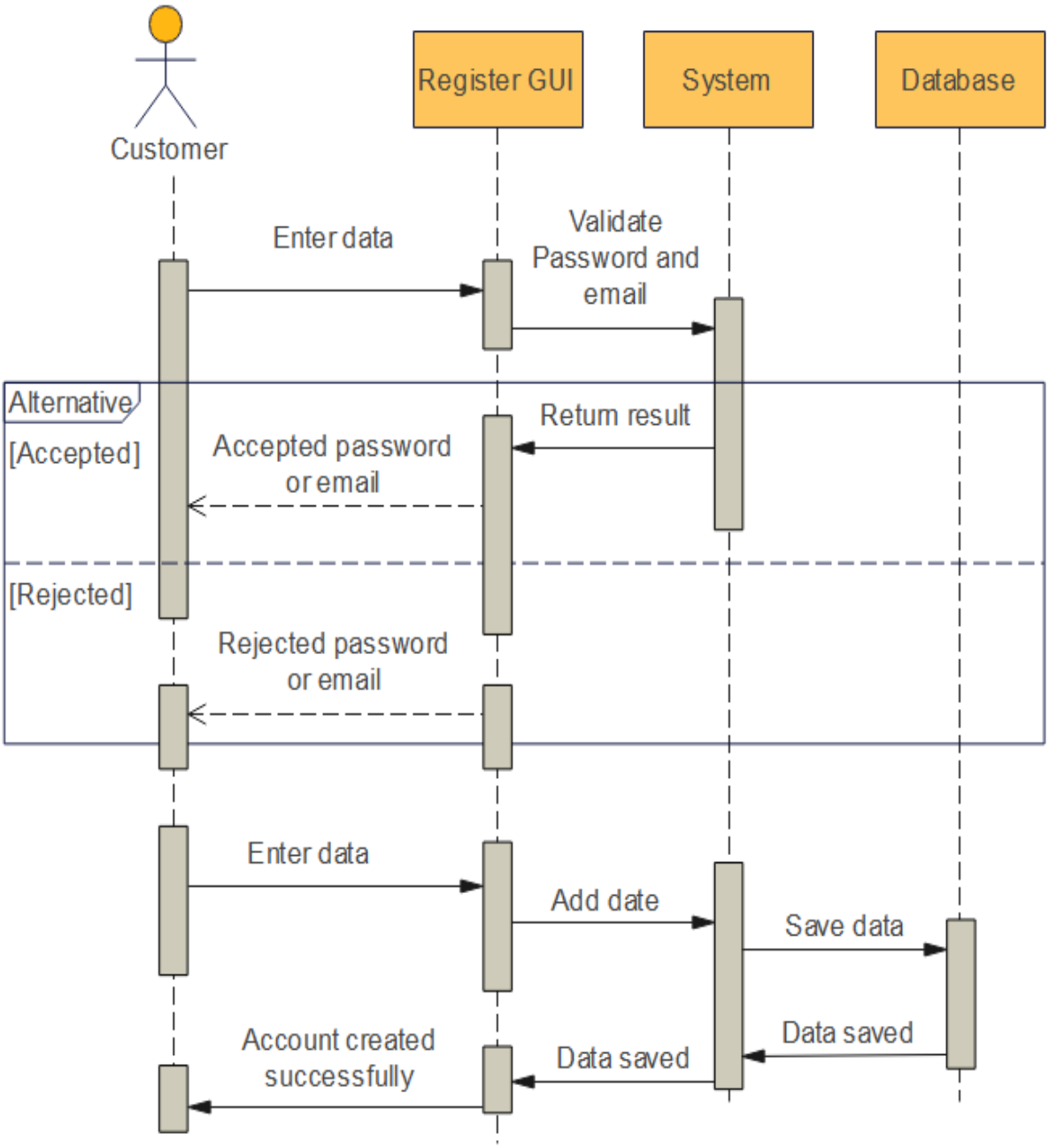
Admin manage users’ profiles:



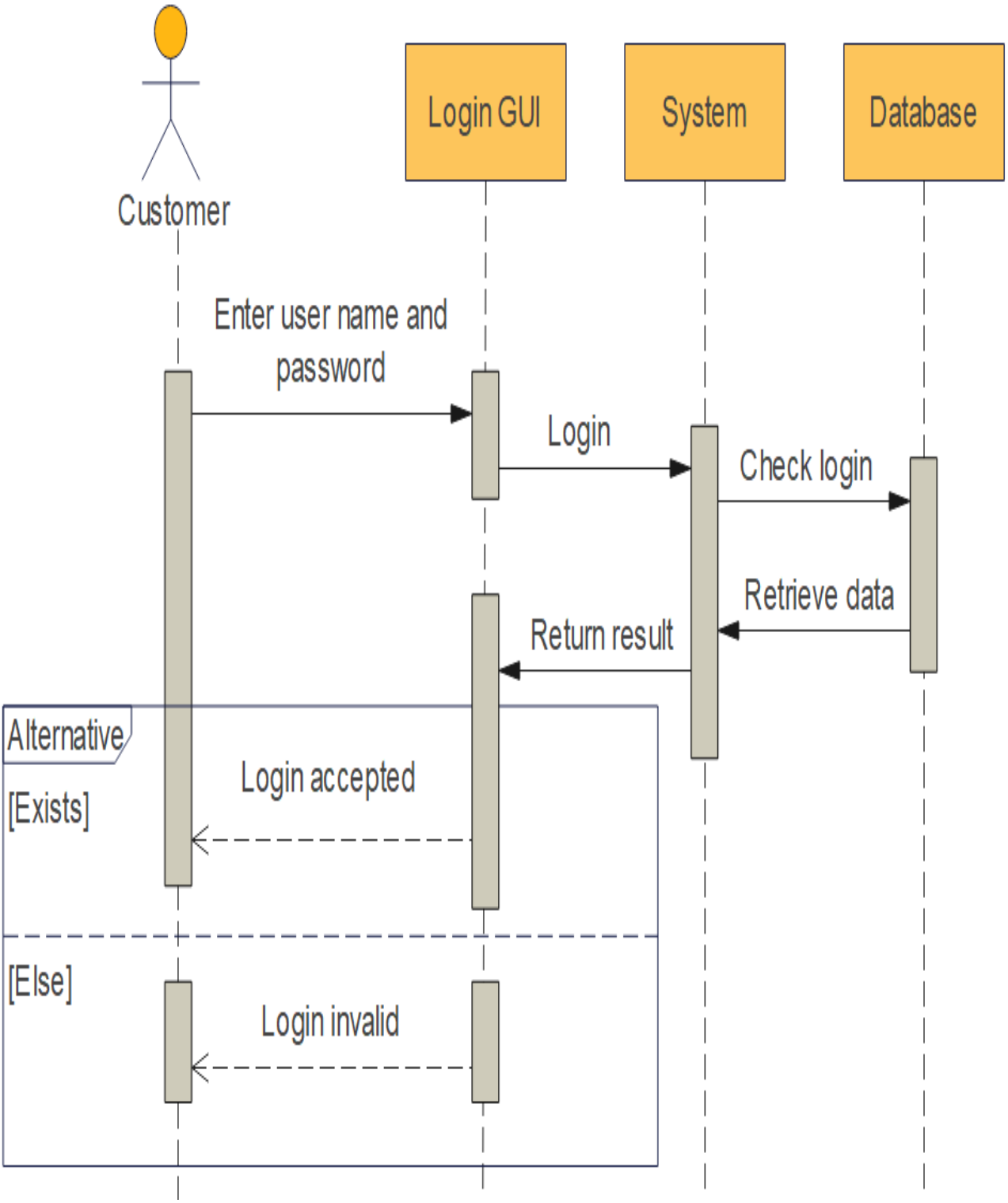
3.2 Sequence diagram:

3.2.1 Customer Sequence Diagram:

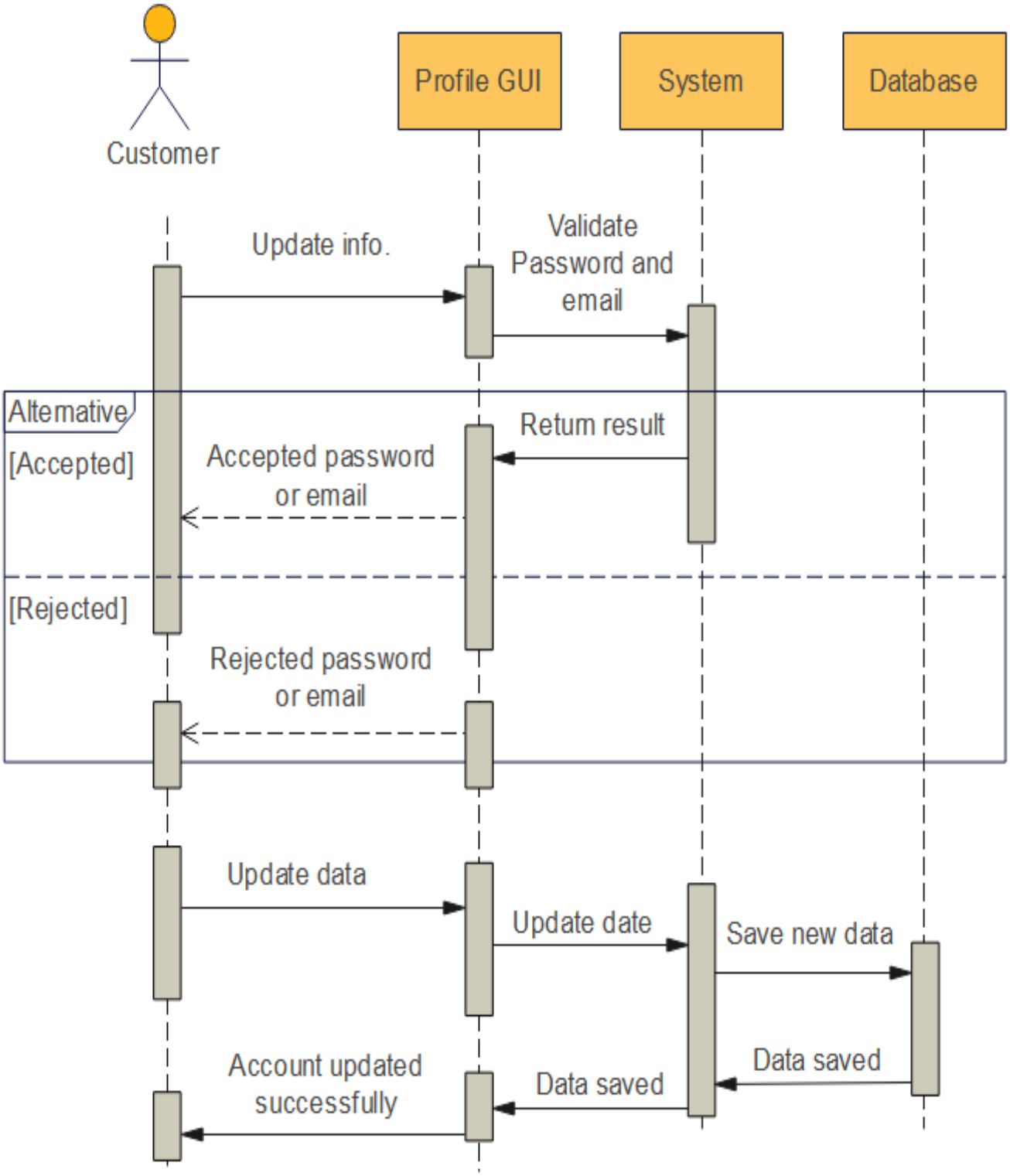
a) Register:



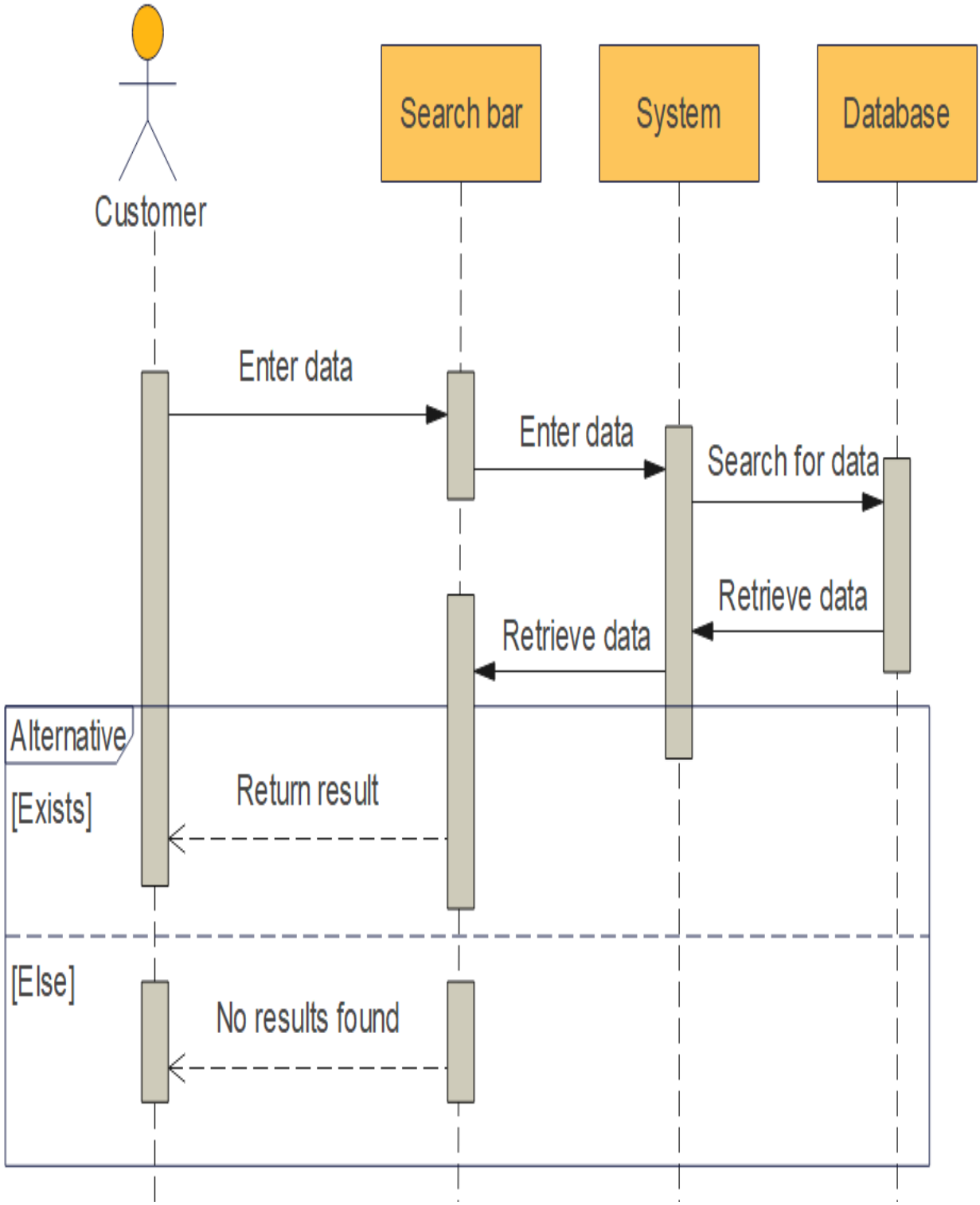
b) Log in:


Customer
Login GUI
System
Database
Enter user name and password
Login
Check login
Retrieve data
Return result
Alternative
[Exists]
Login accepted
[Else]
Login invalid

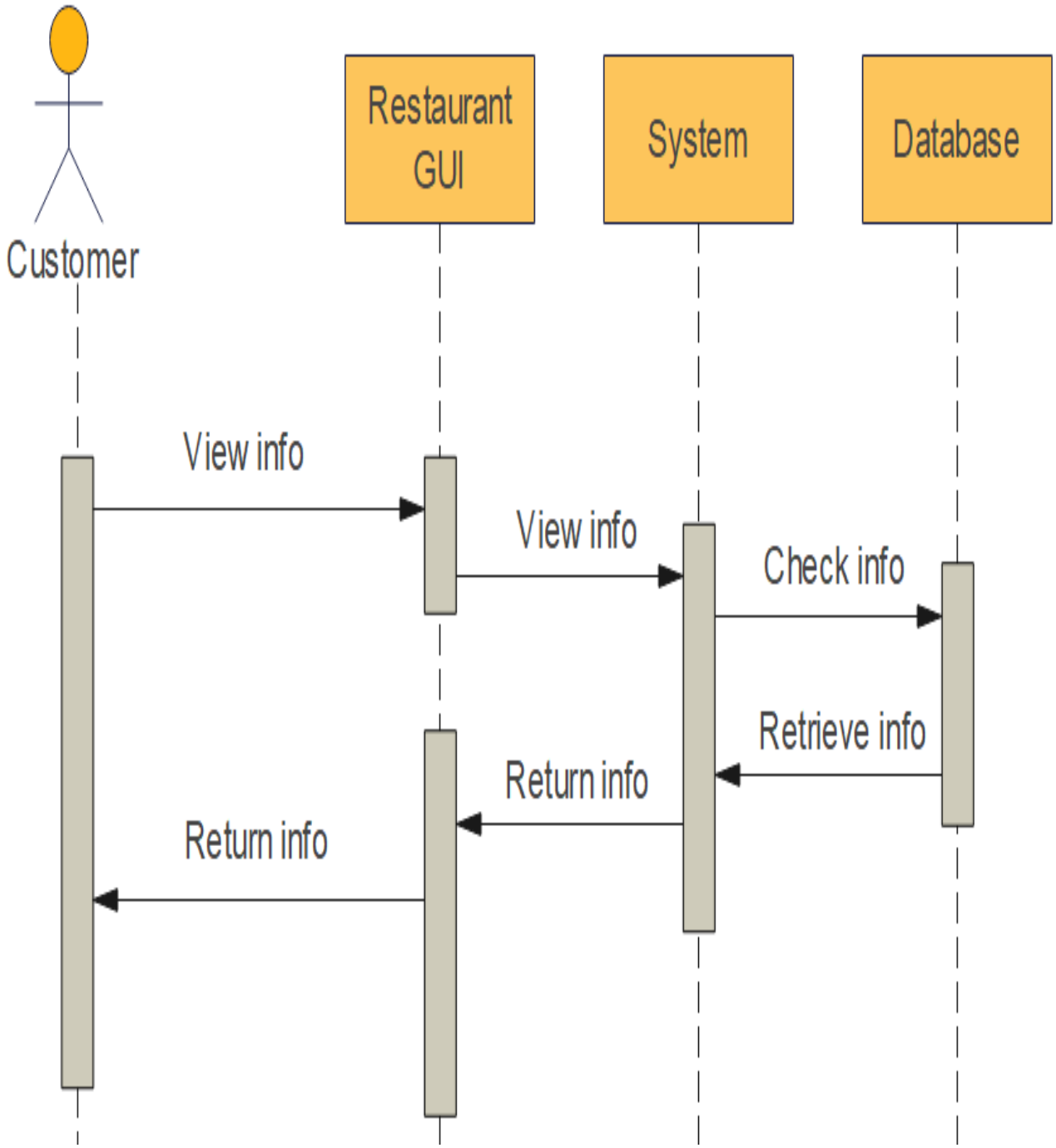
c) Update information:



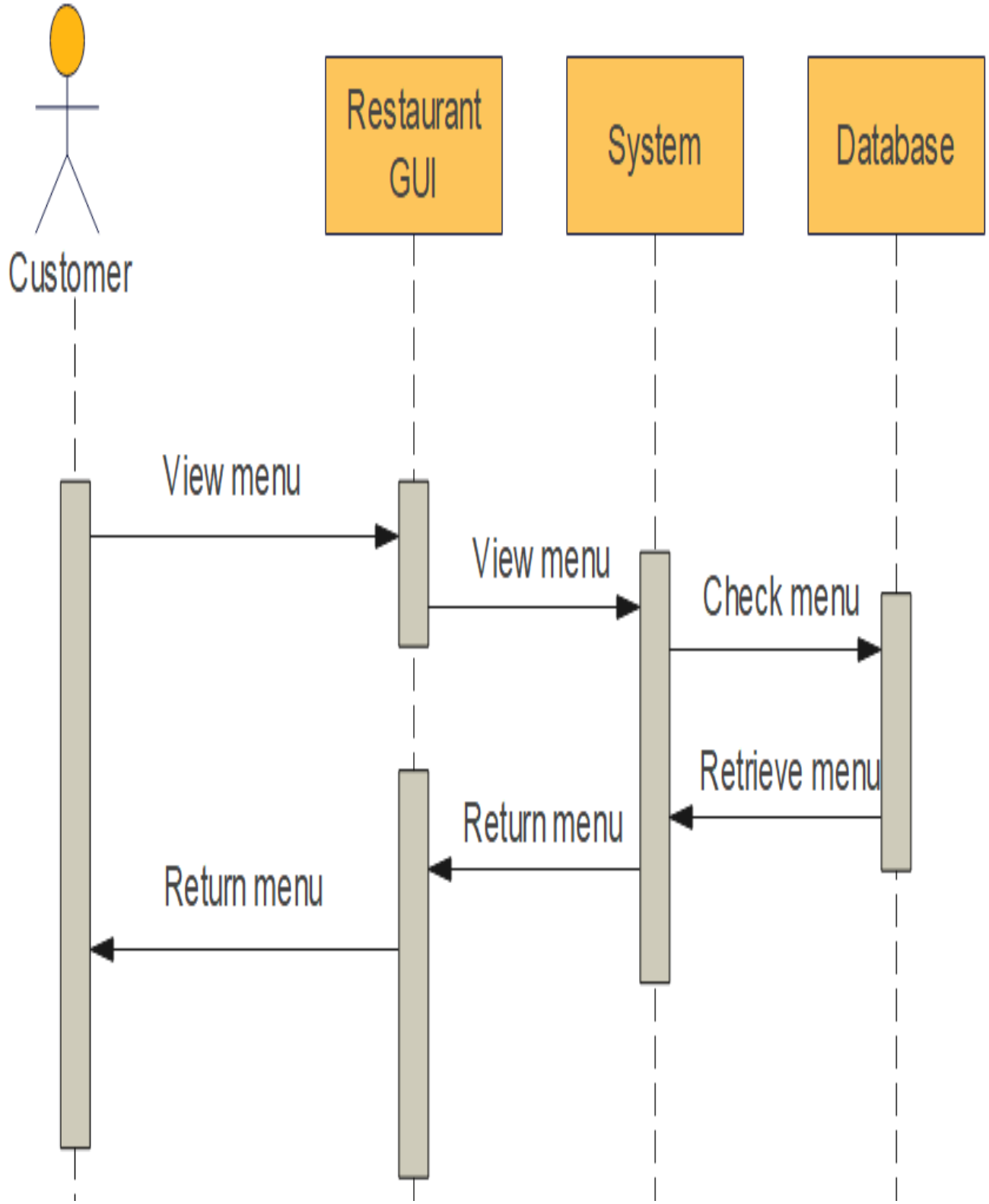
d) Search:


Customer
Search bar
System
Database
Enter data
Enter data
Search for data
Retrieve data
Retrieve data
Alternative
[Exists]
Return result
[Else]
No results found

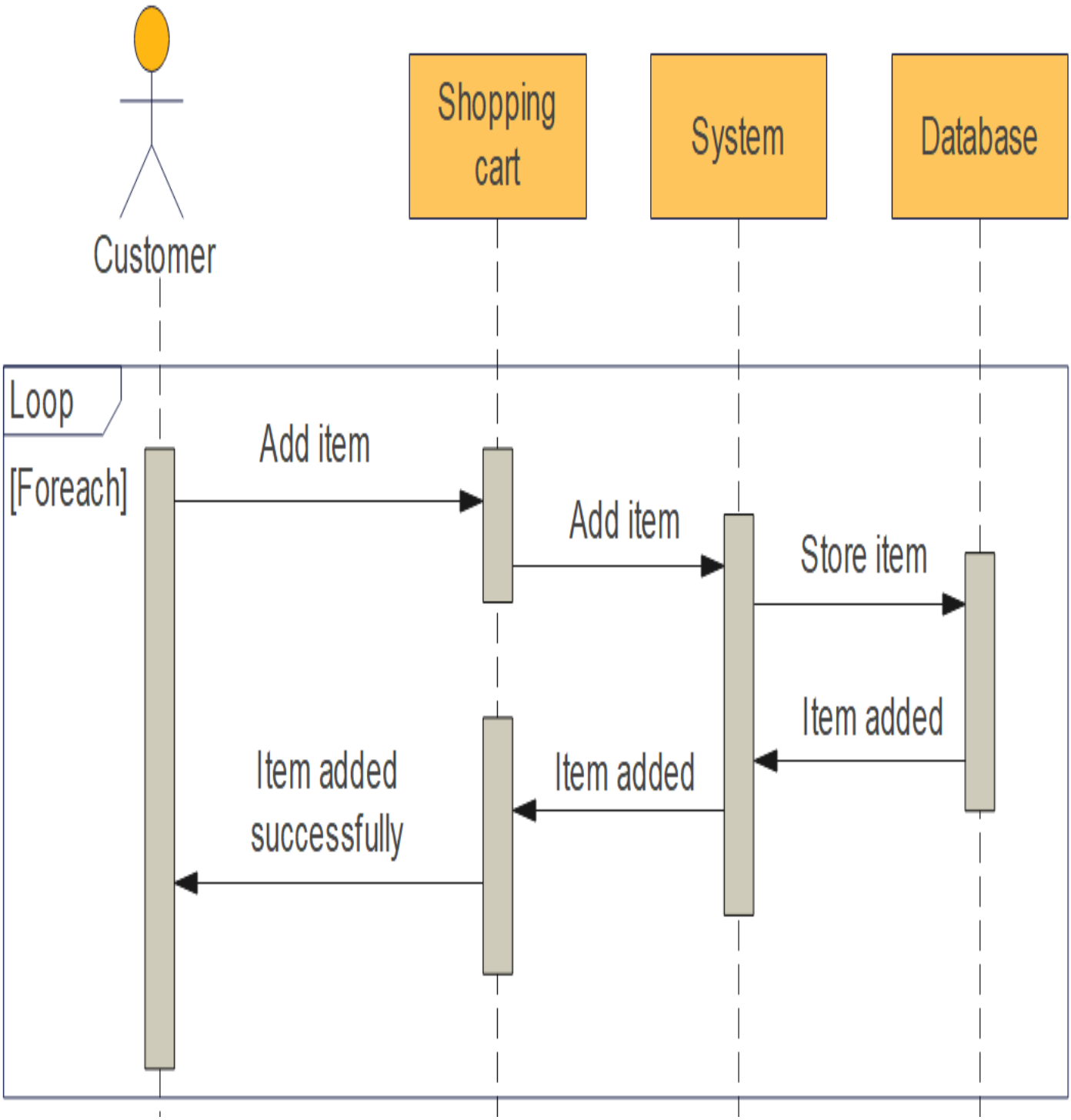
e) View restaurant info:



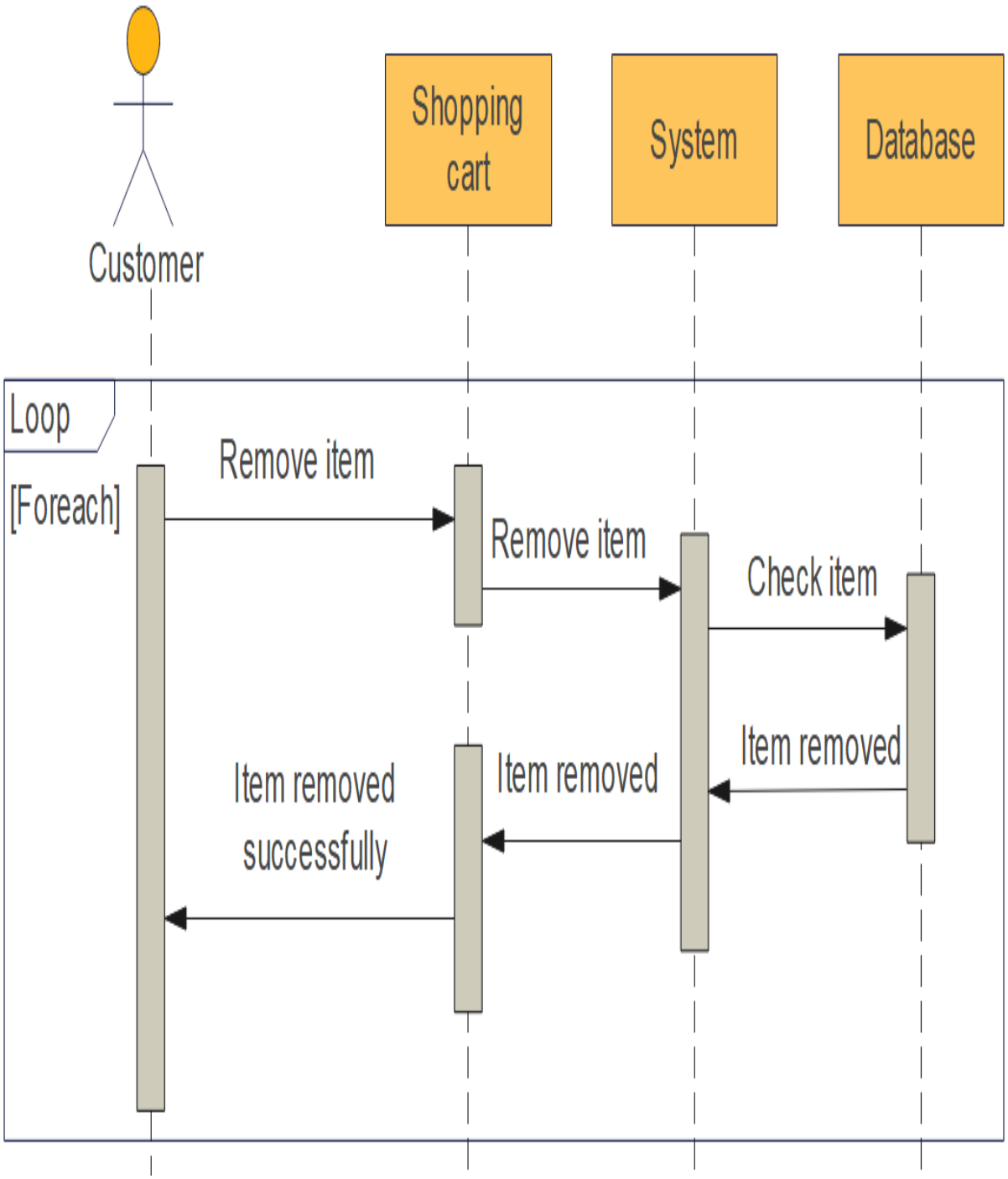
f) View restaurant menu:



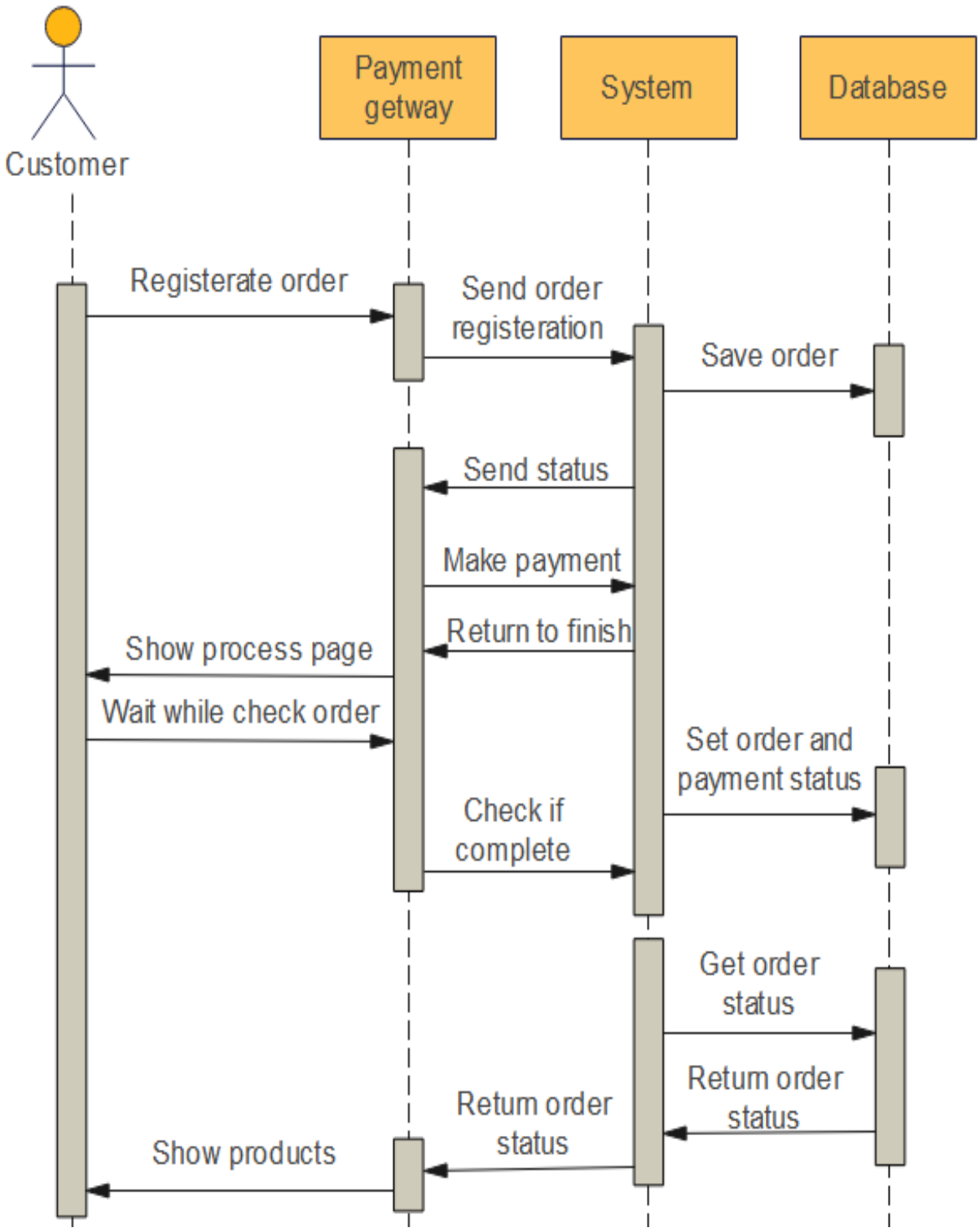
g) Add item in shopping cart:



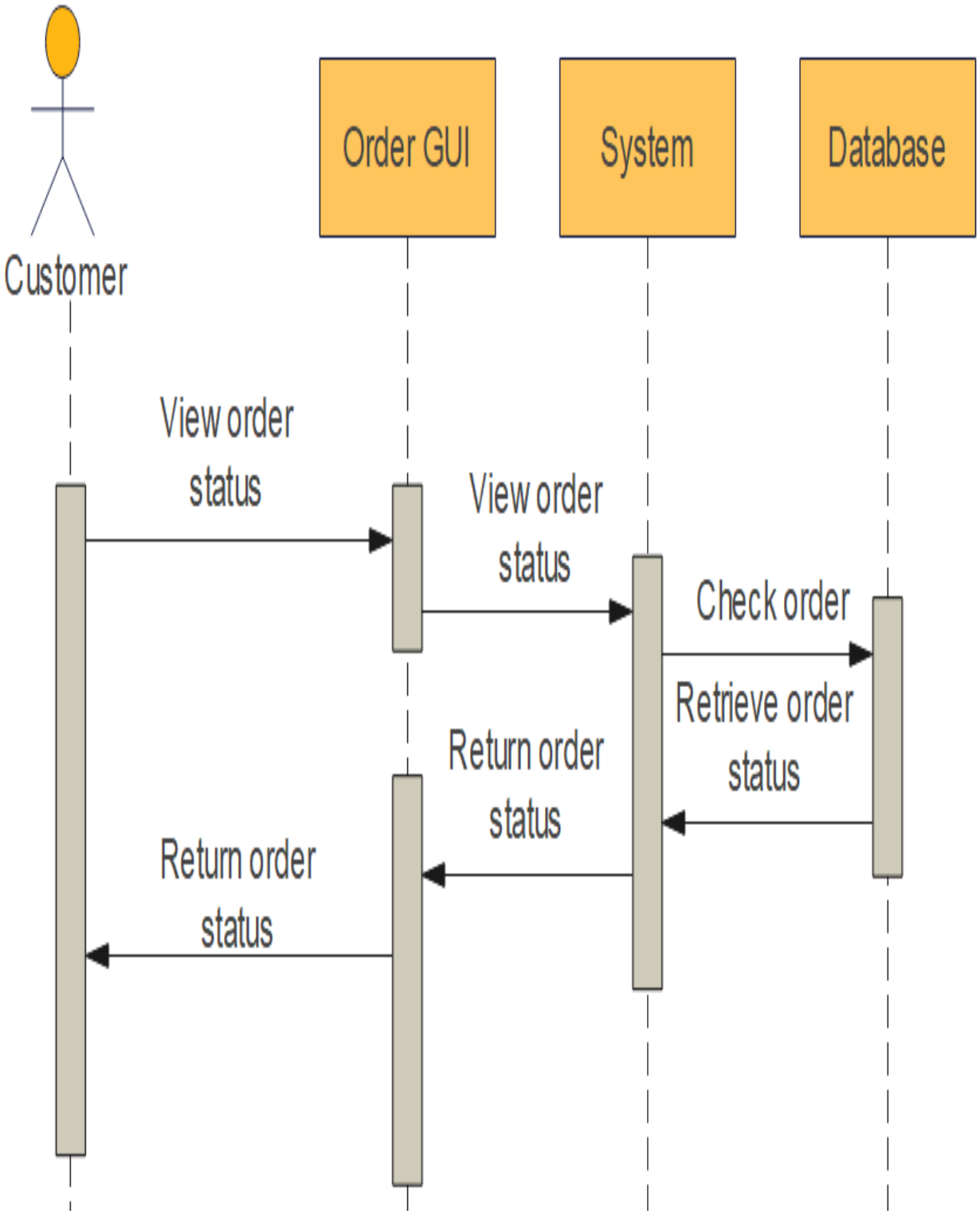
h) Remove item from shopping cart:



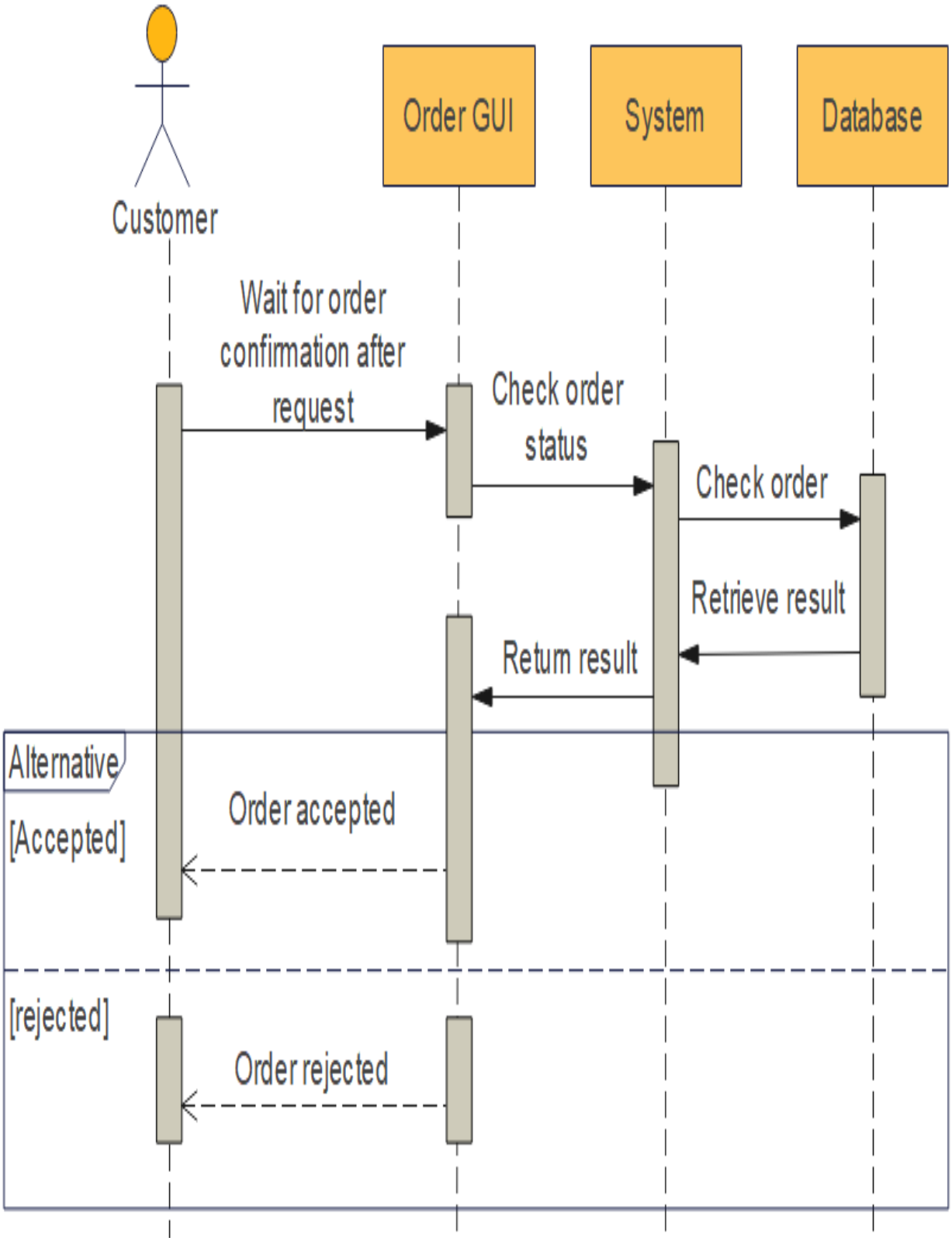
i) Pay for order:



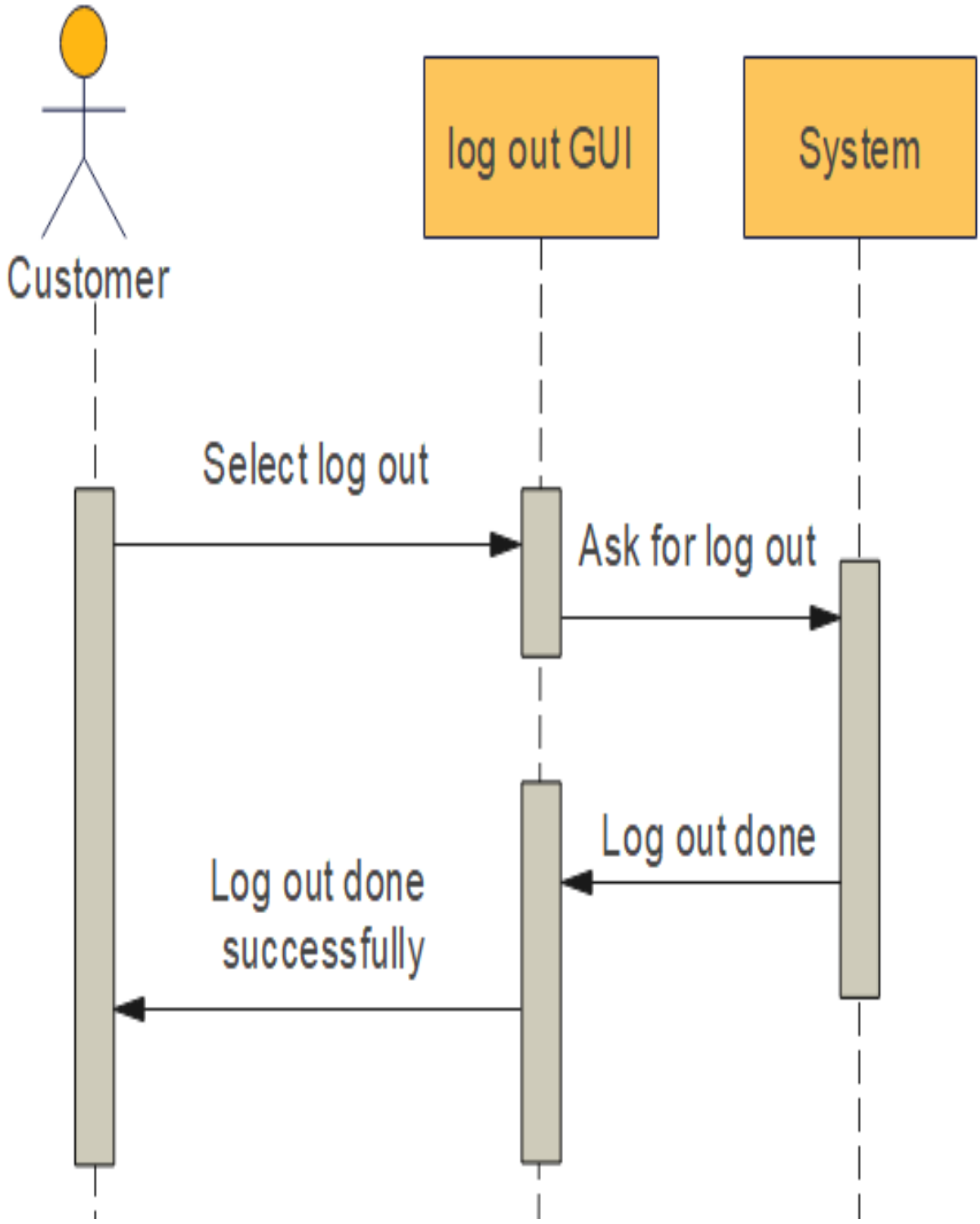
j) View order status:



k) Receive order confirmation:

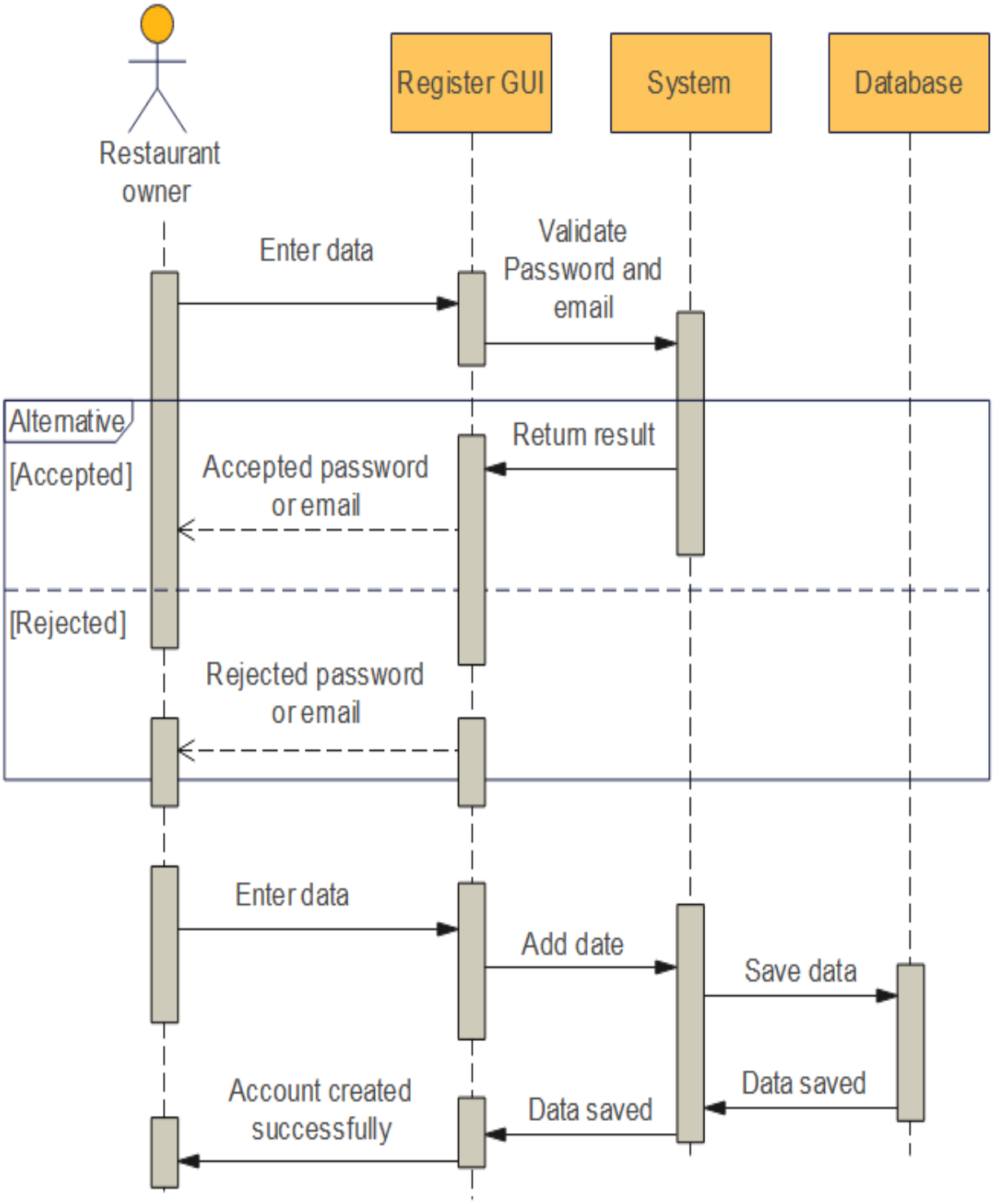


g) Log out:

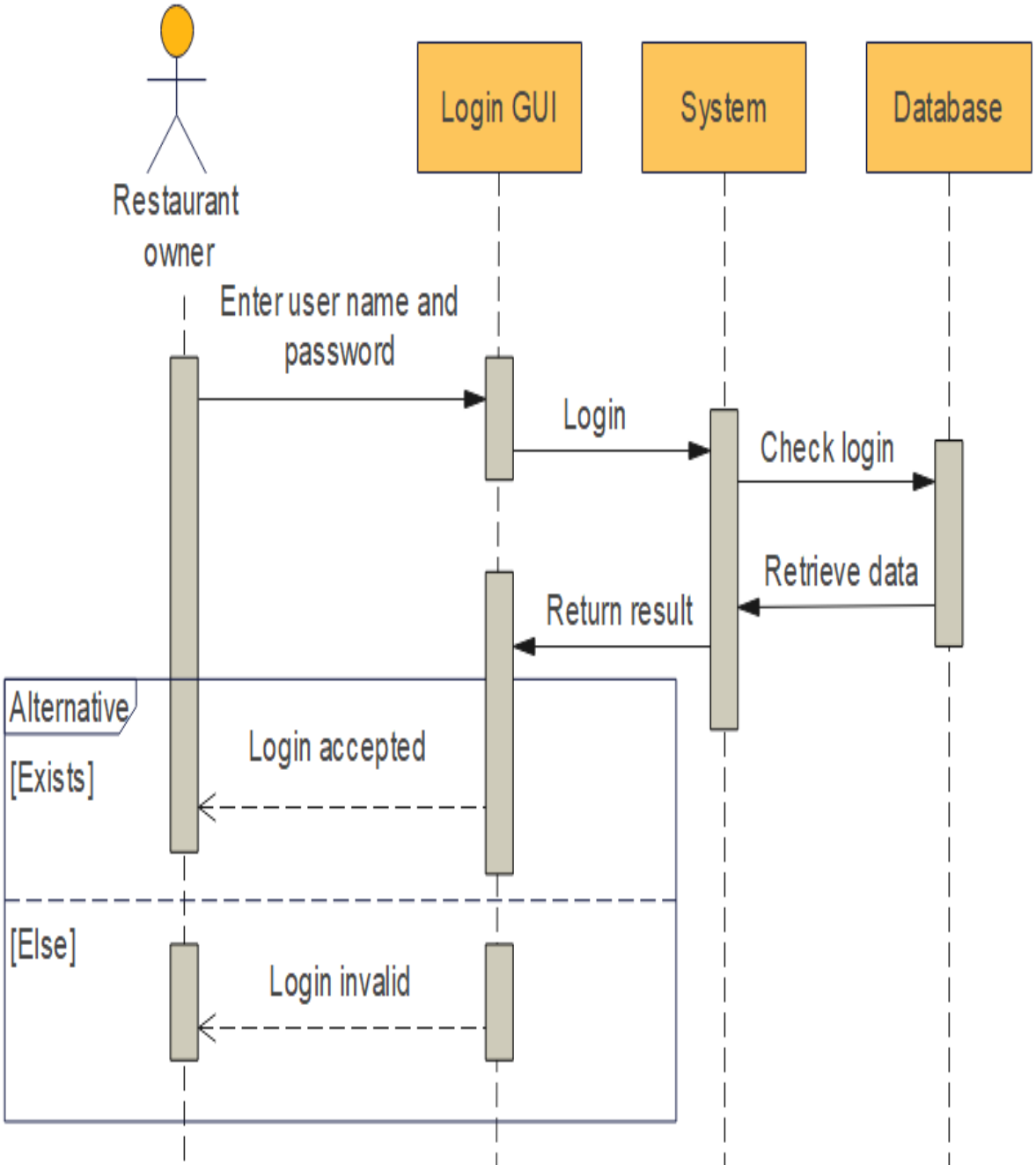

Customer
log out GUI
System
Select log out
Ask for log out
Log out done
Log out done
successfully

3.2.2 Restaurant Owner Sequence Diagram:

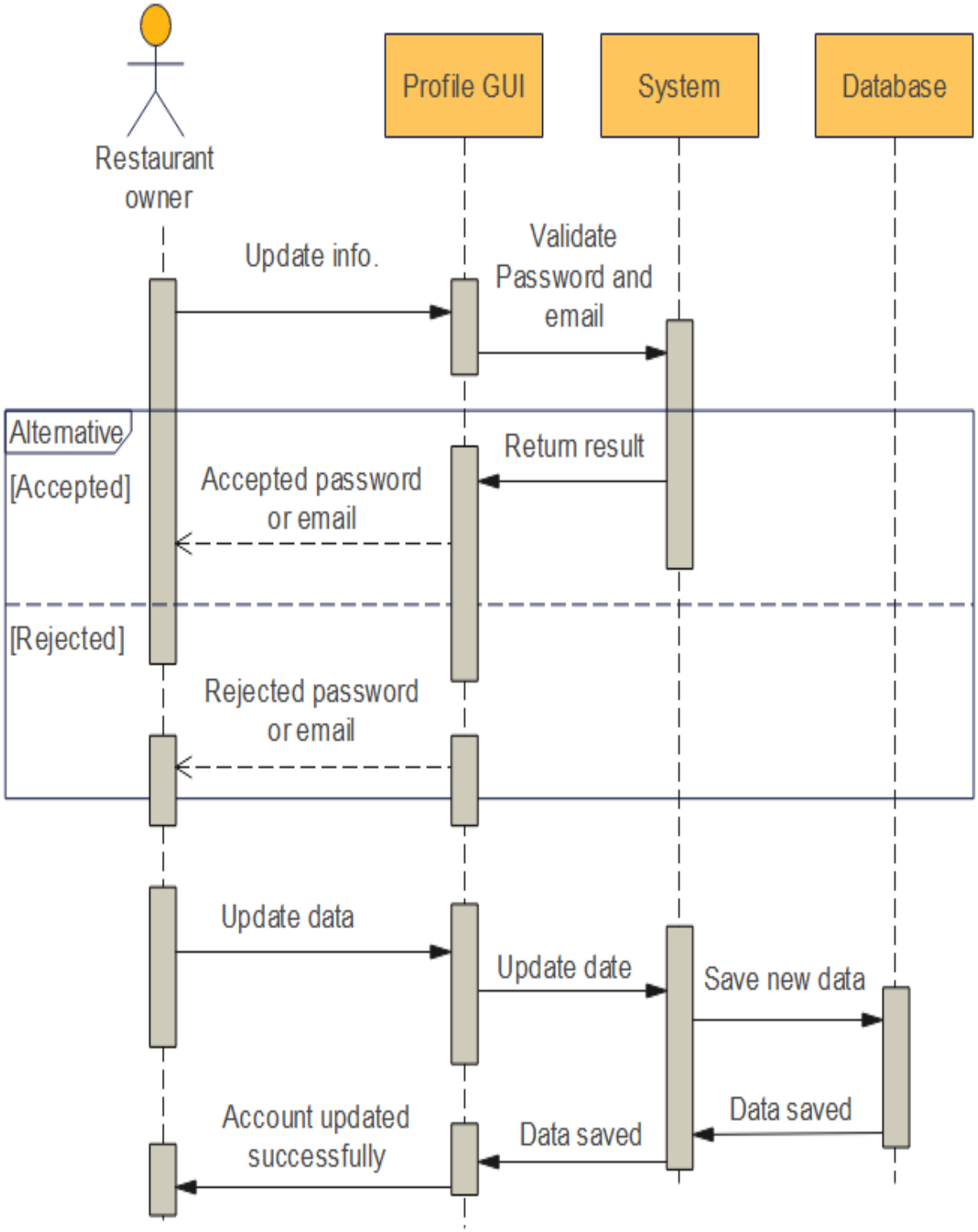
a) Register:



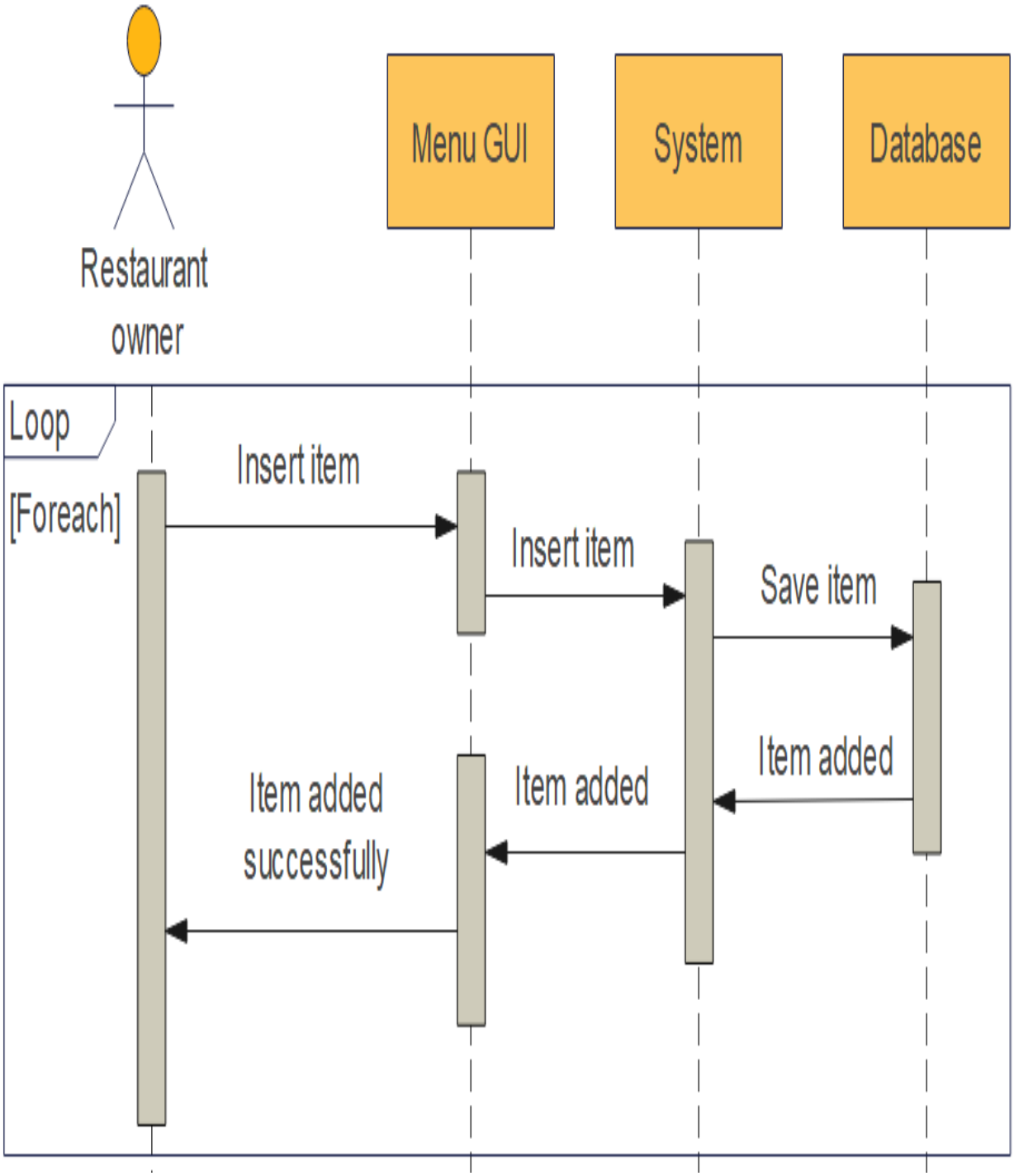
b) Log in:


Restaurant owner
Login GUI
System
Database
Enter user name and password
Login
Check login
Retrieve data
Return result
Alternative
[Exists]
Login accepted
[Else]
Login invalid

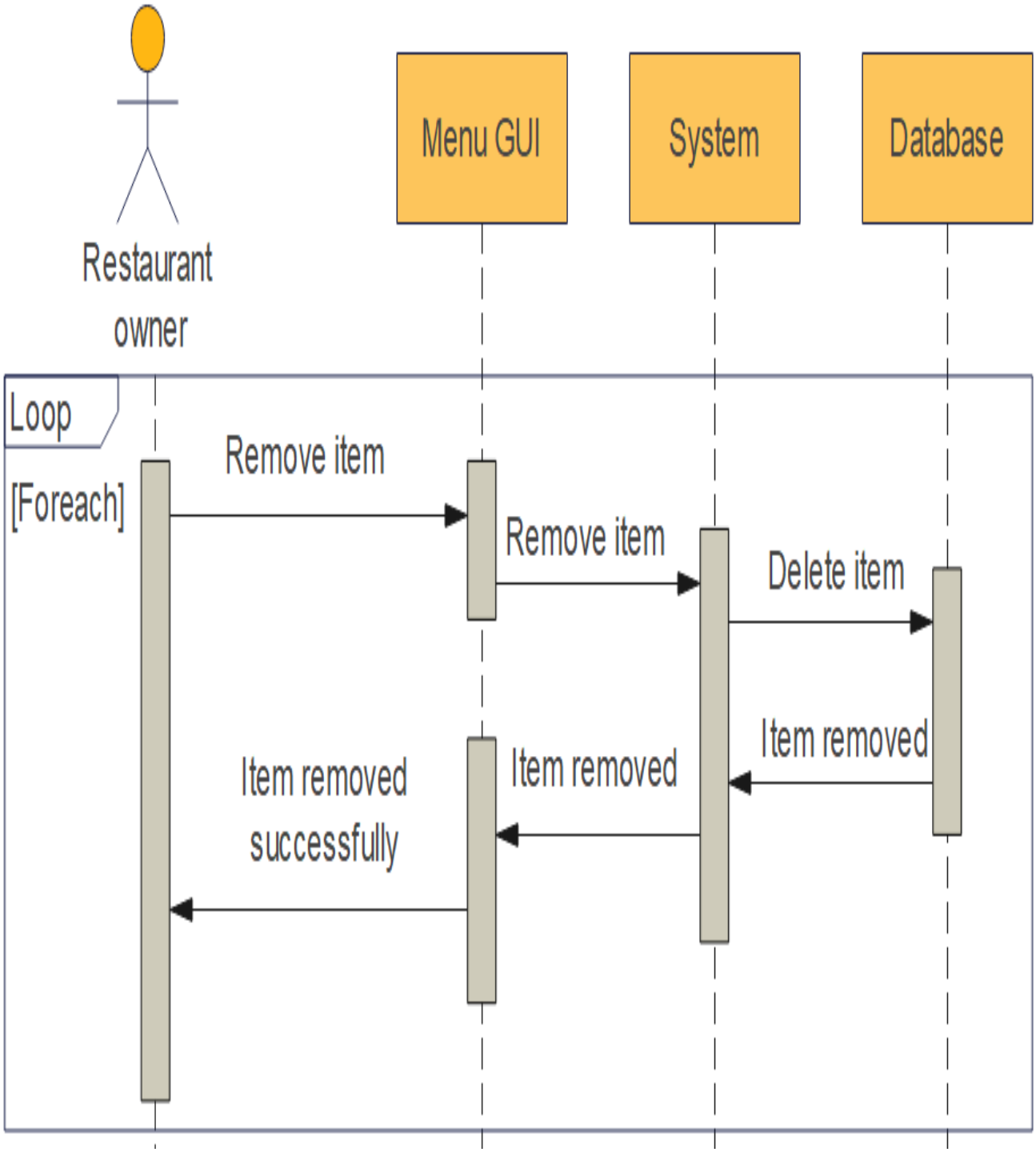
c) Update information:



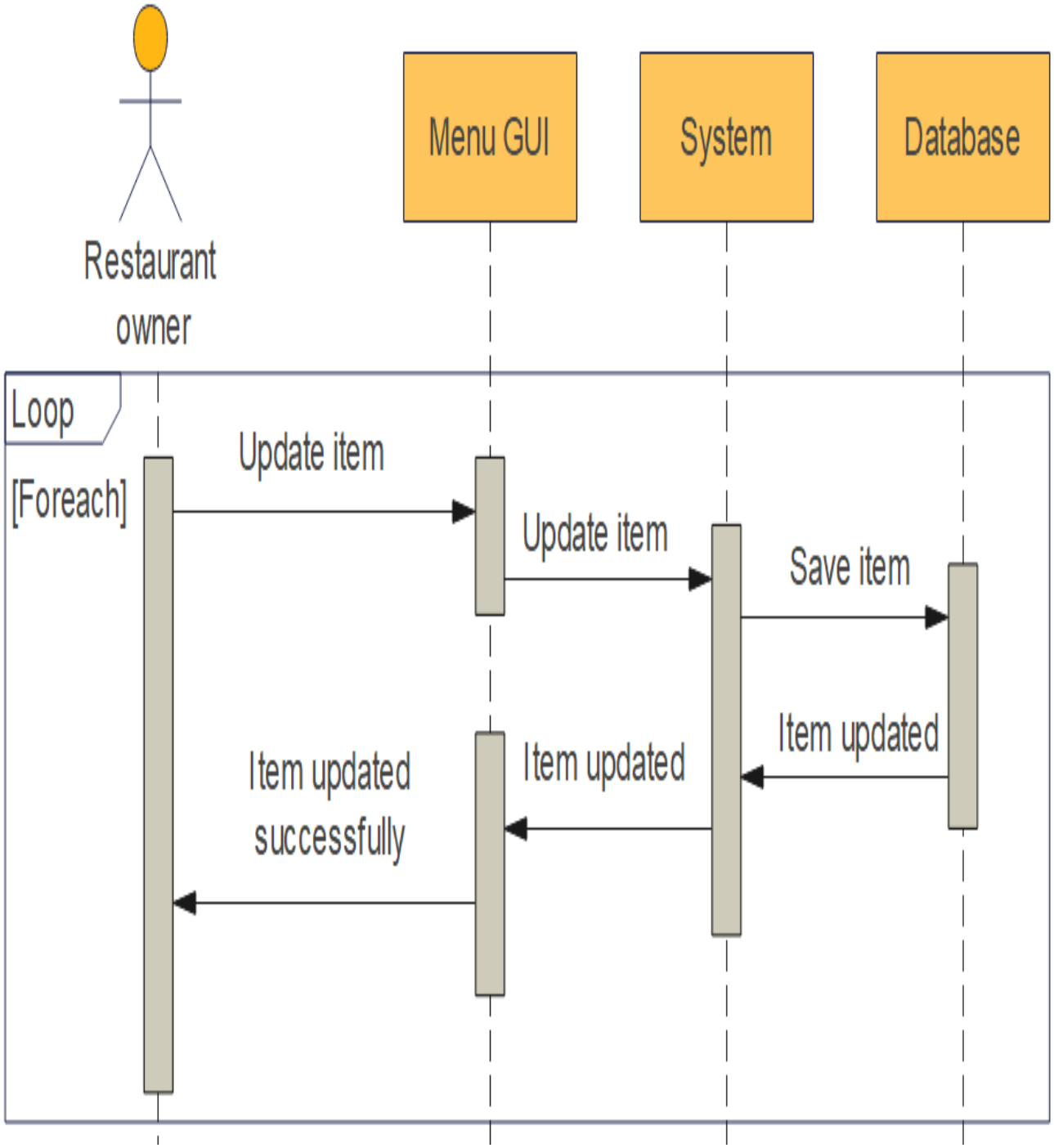
d) Insert item in food menu:



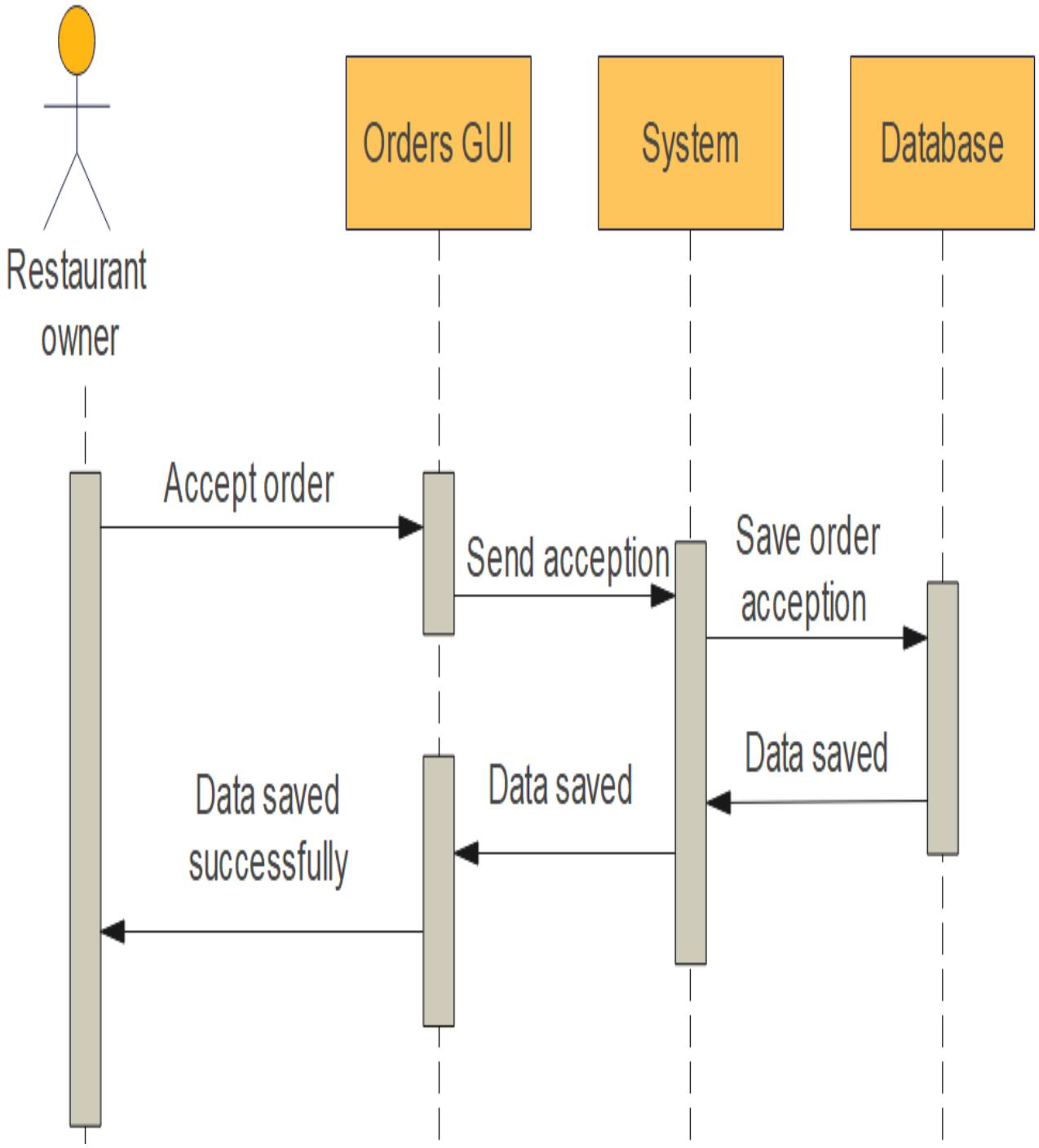
e) Remove item from food menu:



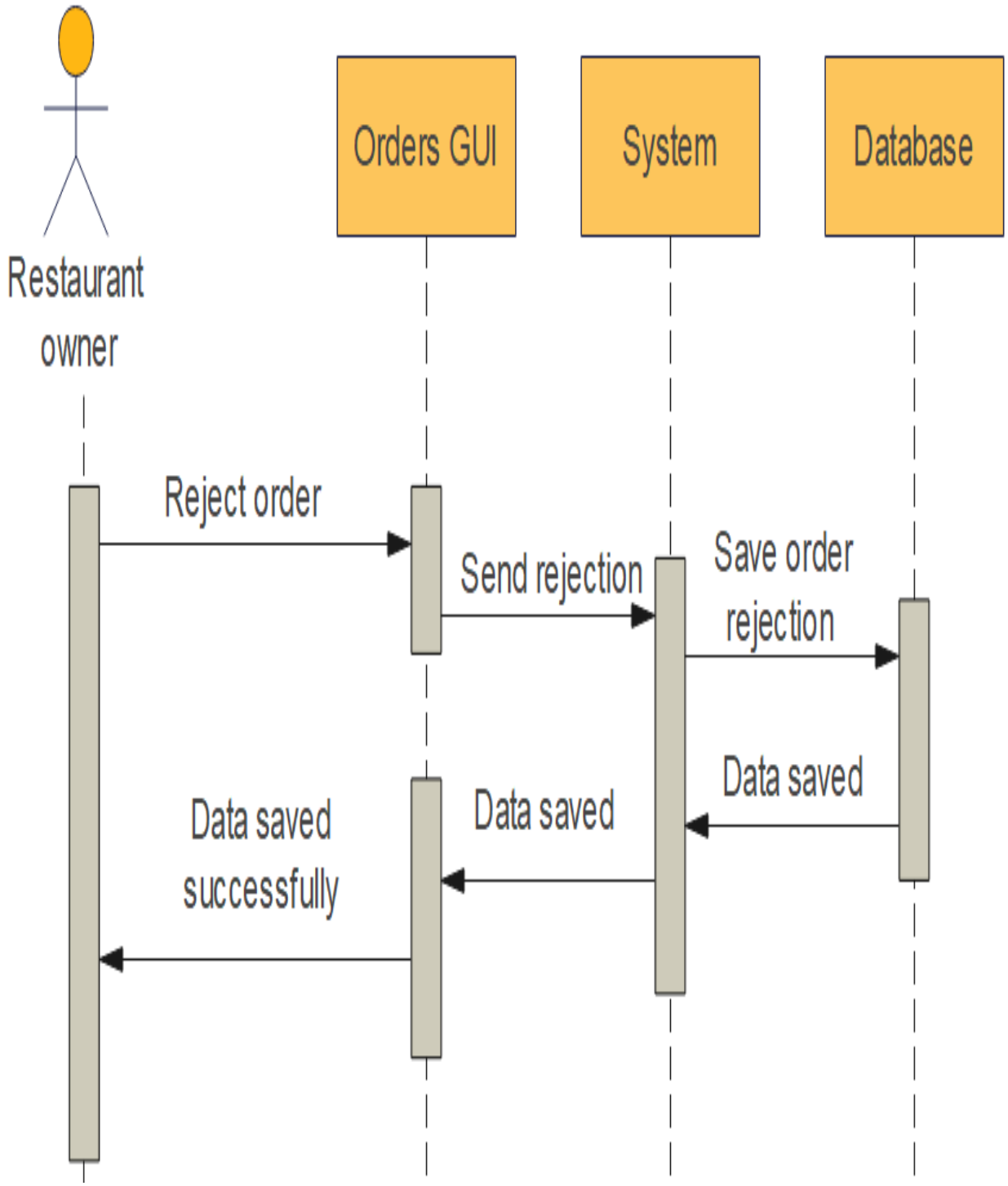
f) Update item in food menu:



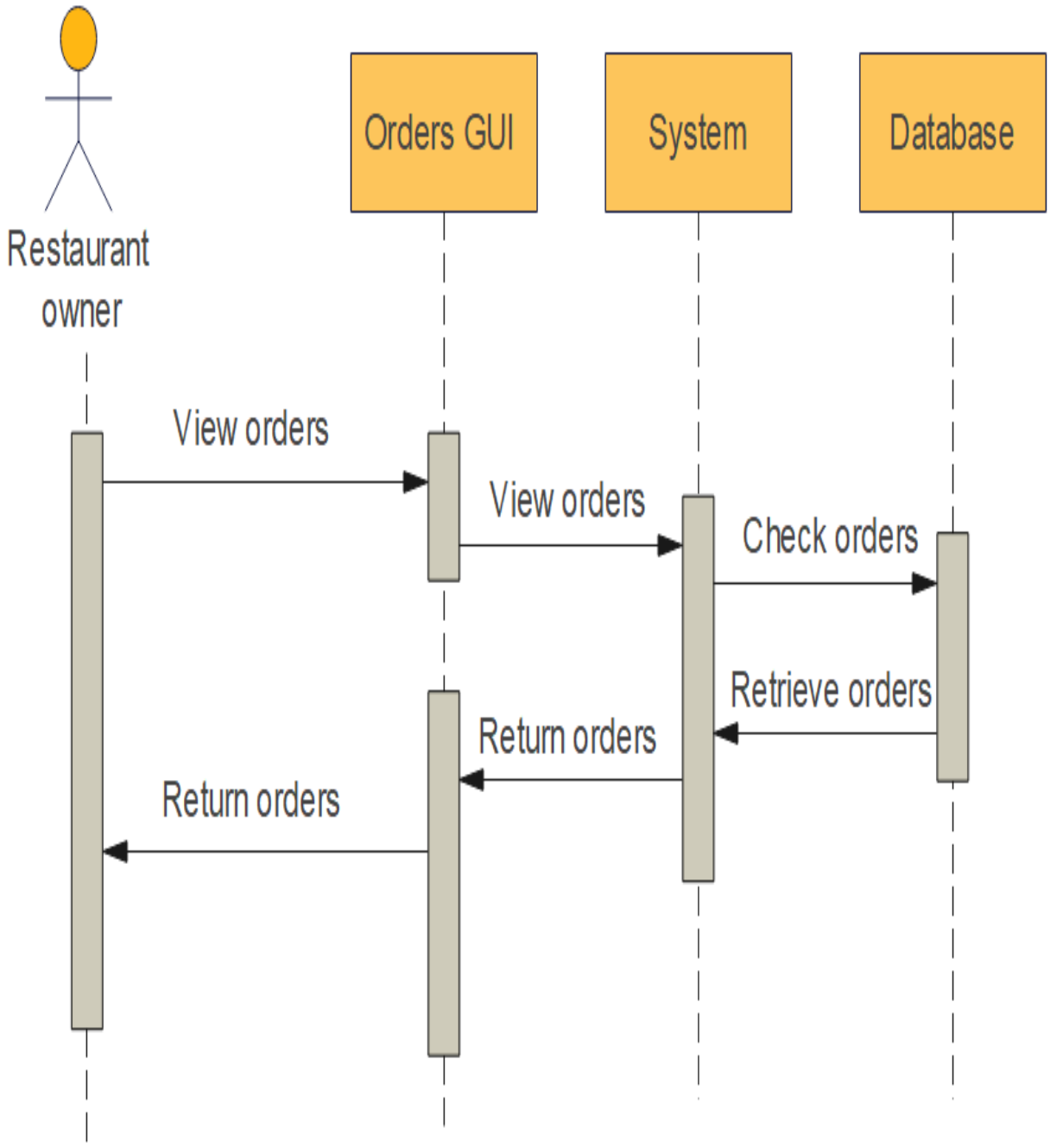
g) Accept order:



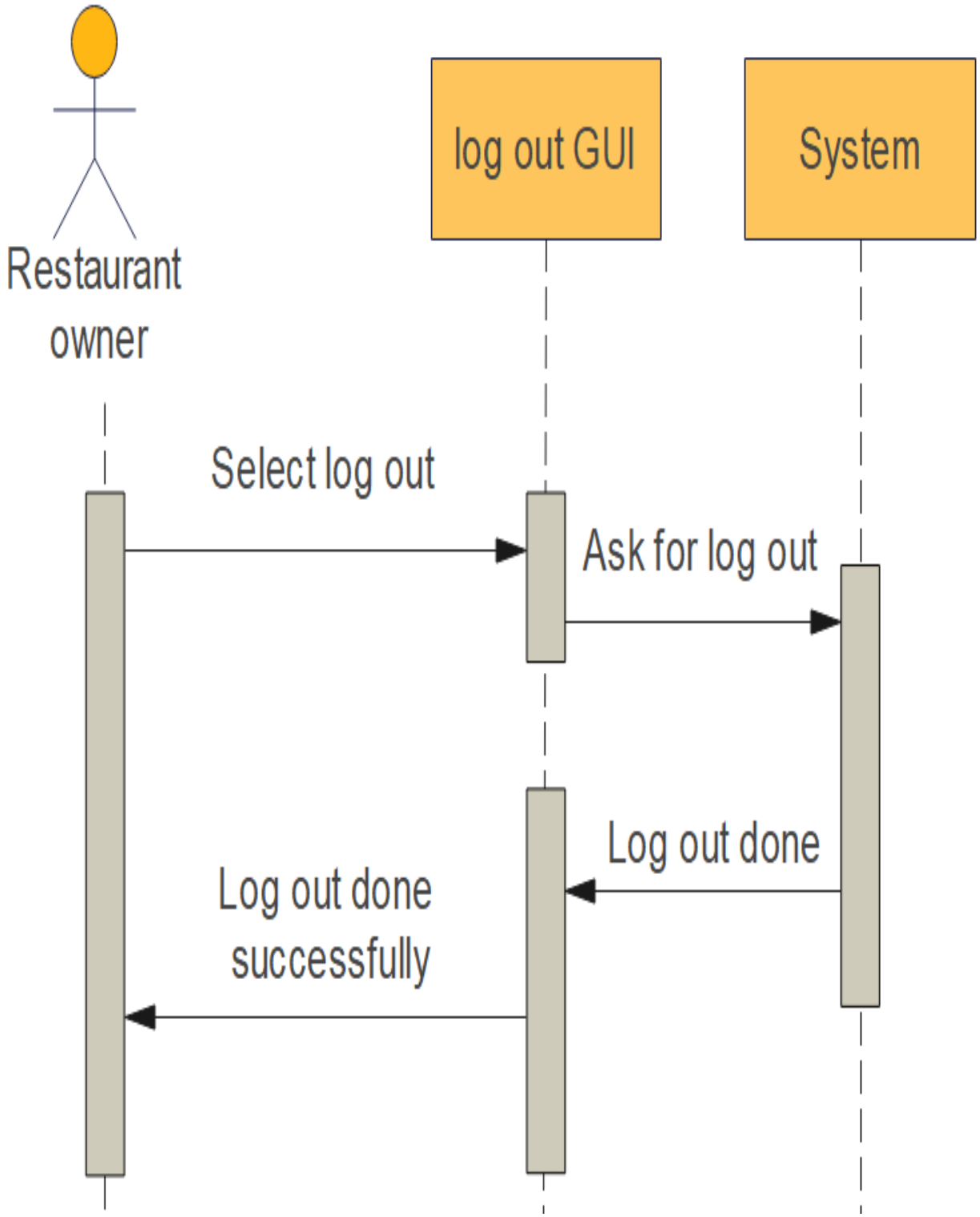
h) Reject order:



i) View orders:

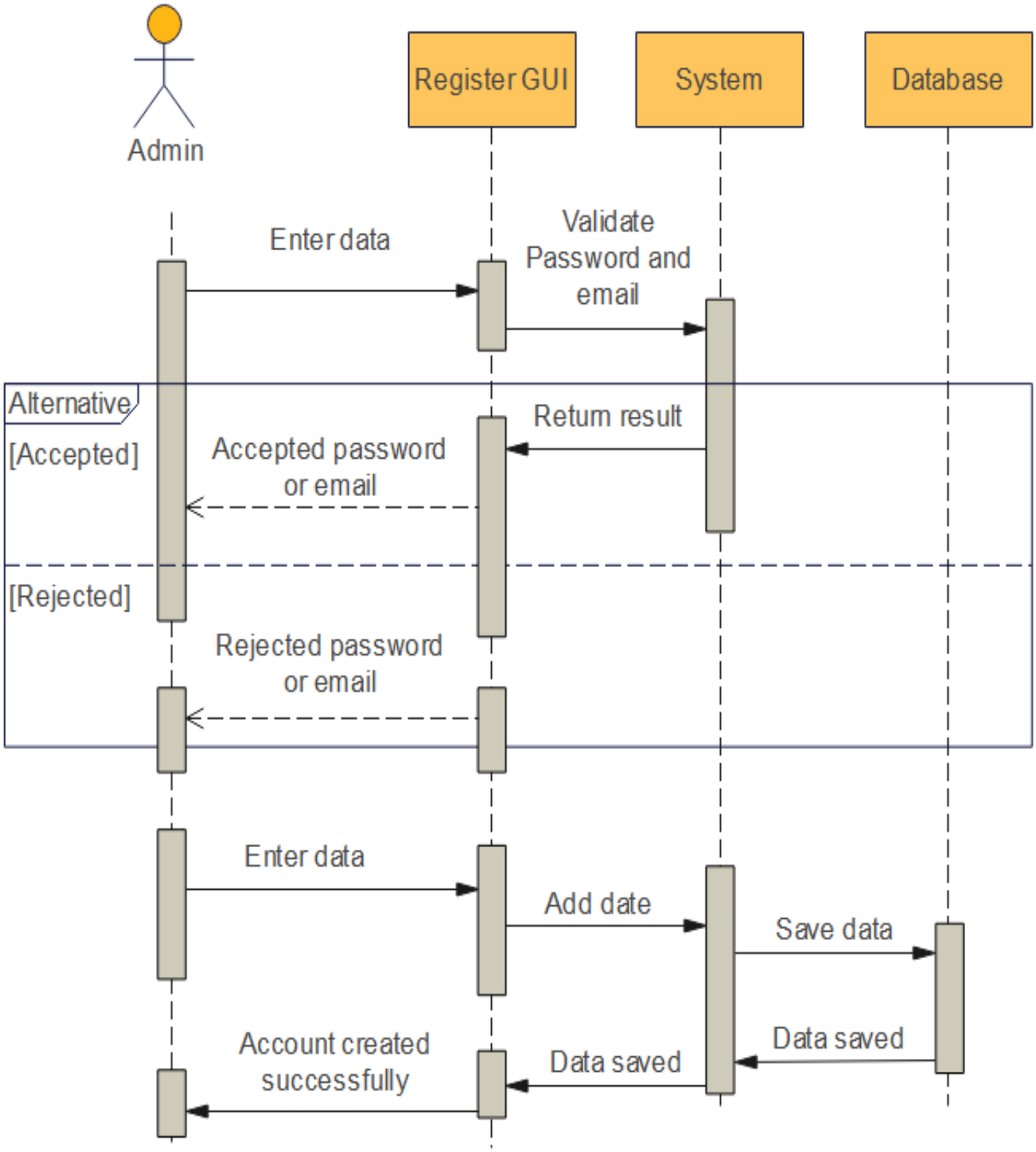


j) Log out:

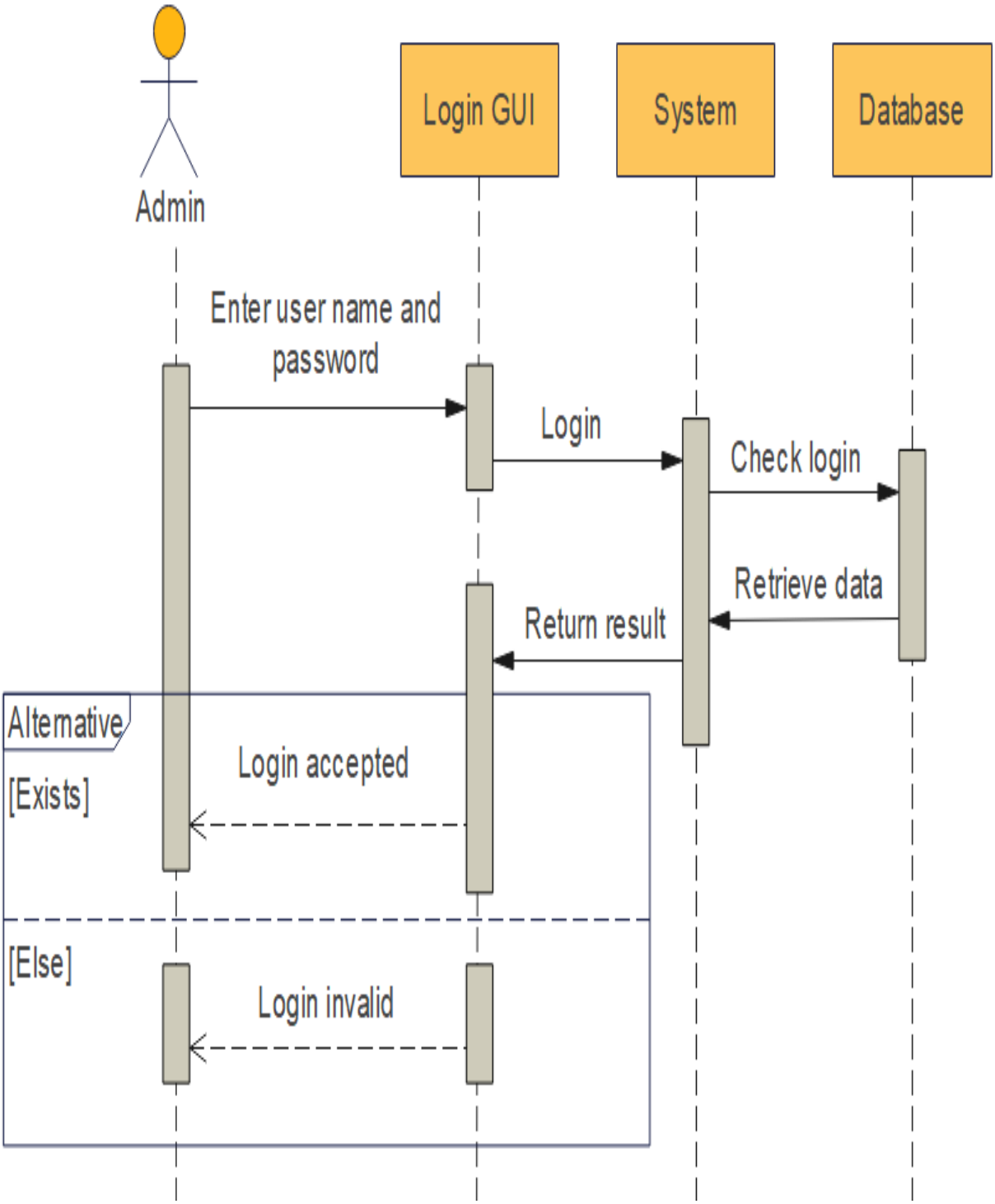

Restaurant owner
log out GUI
System
Select log out
Ask for log out
Log out done
Log out done successfully

3.2.3 Admin Sequence Diagram:

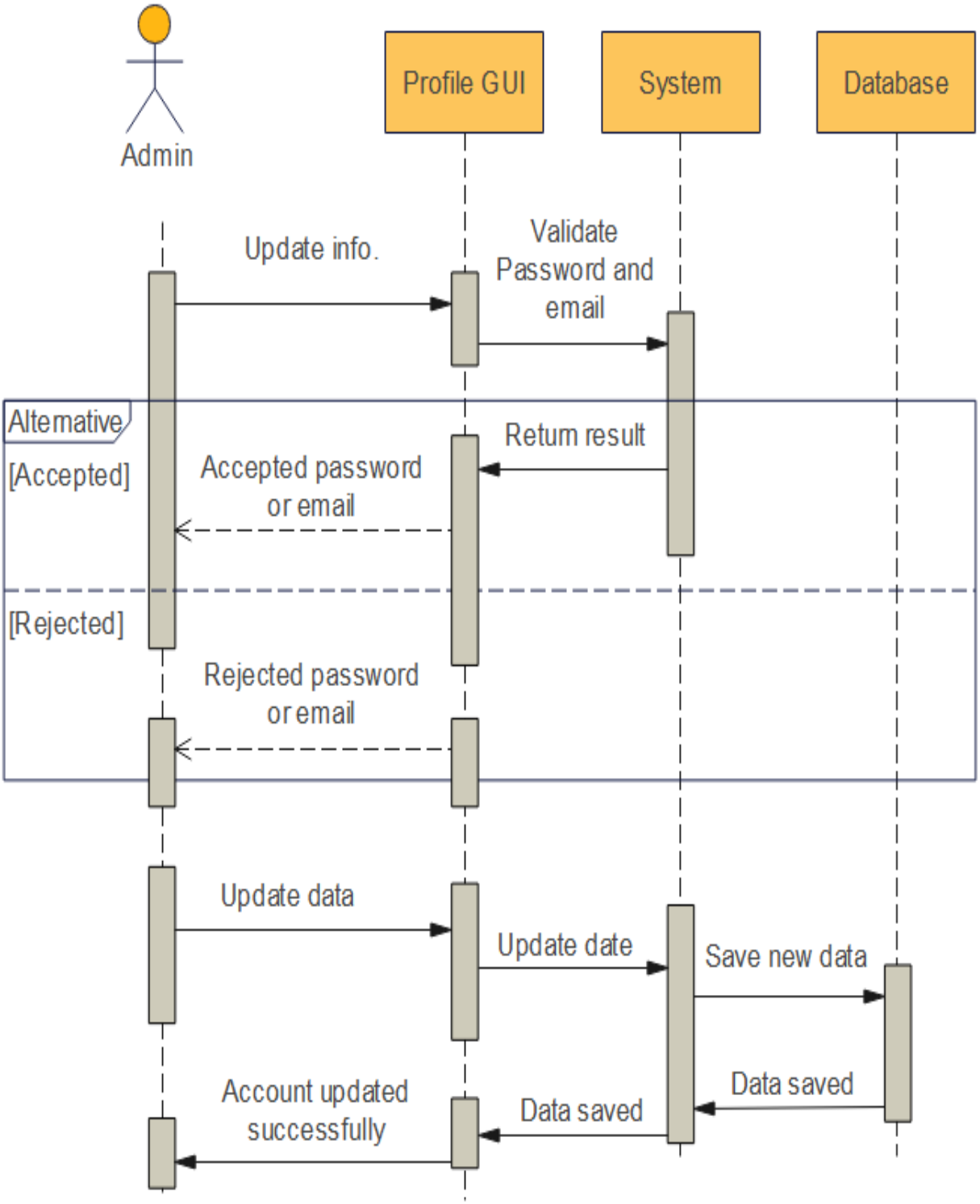
a) Register:



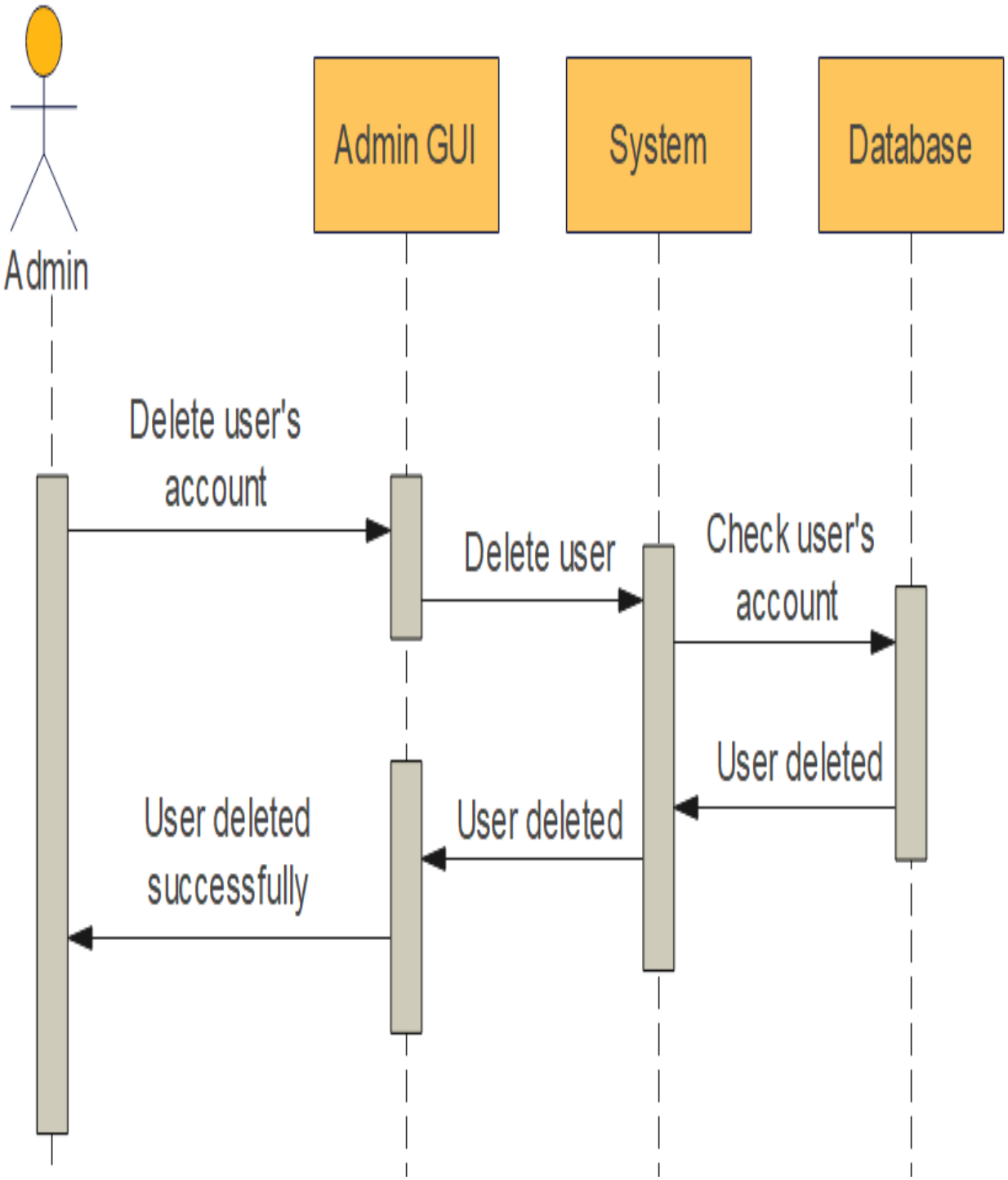
b) Log in:


Admin
Login GUI
System
Database
Enter user name and password
Login
Check login
Retrieve data
Return result
Alternative
[Exists]
Login accepted
[Else]
Login invalid

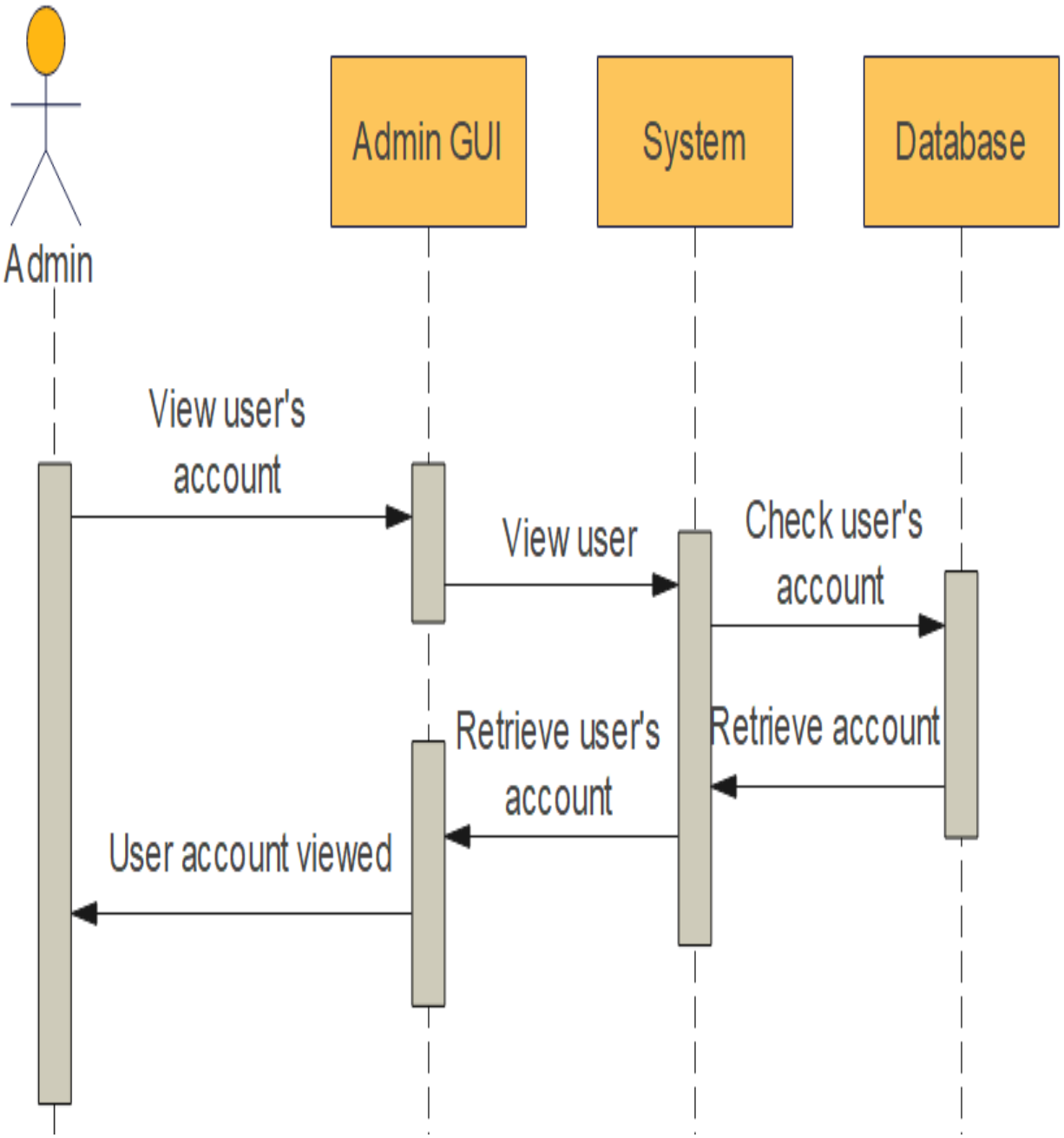
c) Update information:



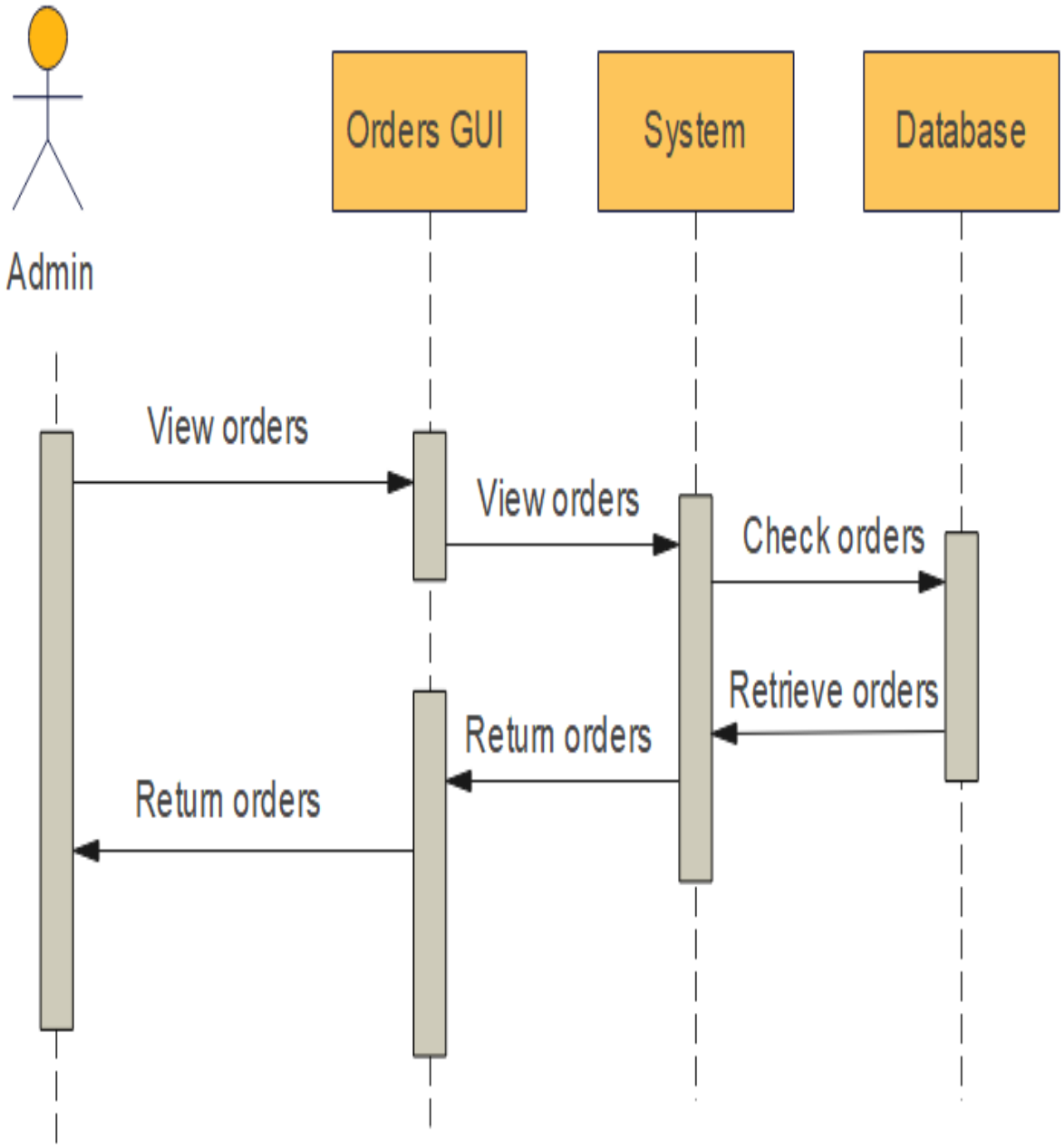
d) Delete user’s profile:



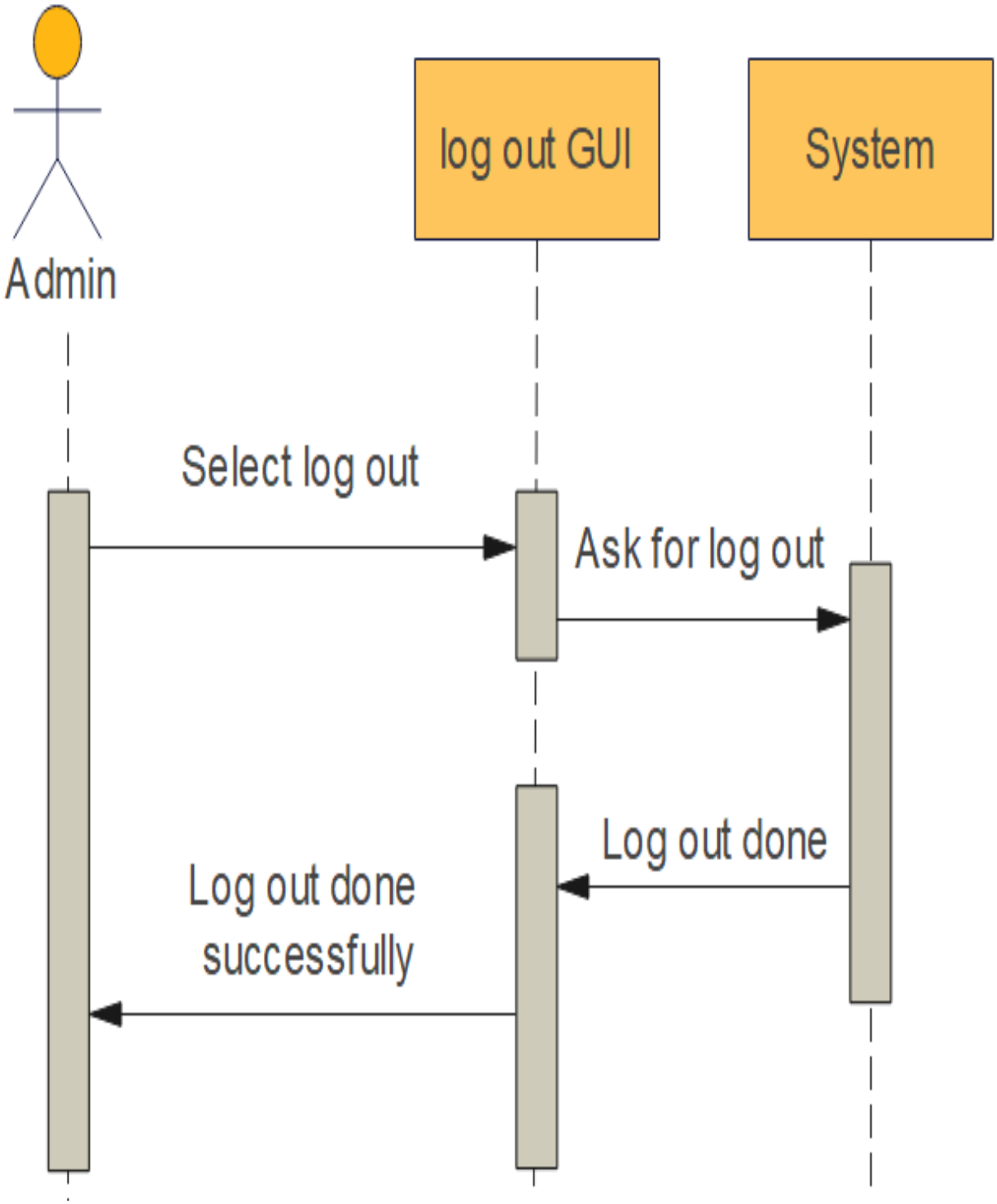
d) View user’s profile:



e) View orders:

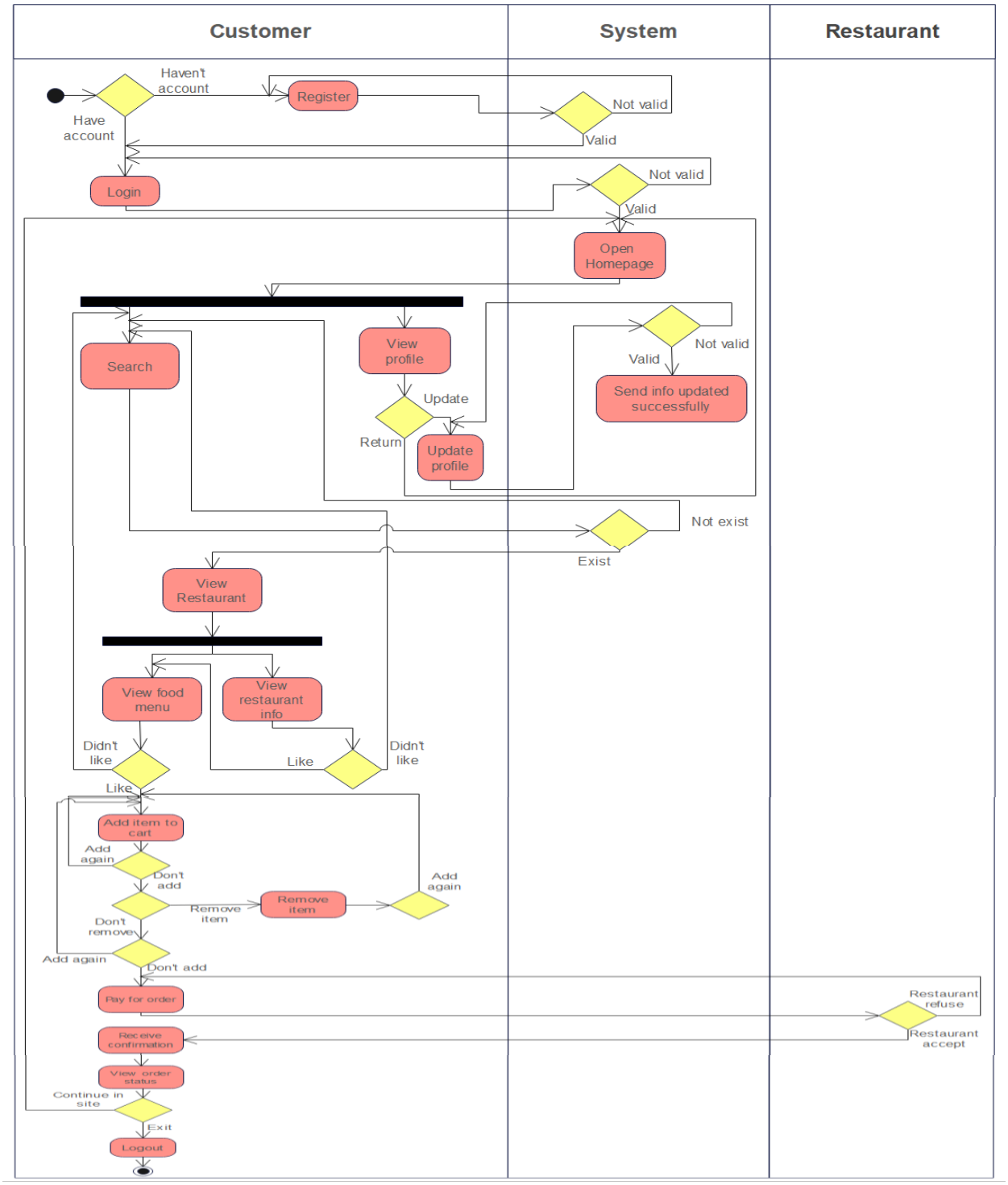


f) Log out:

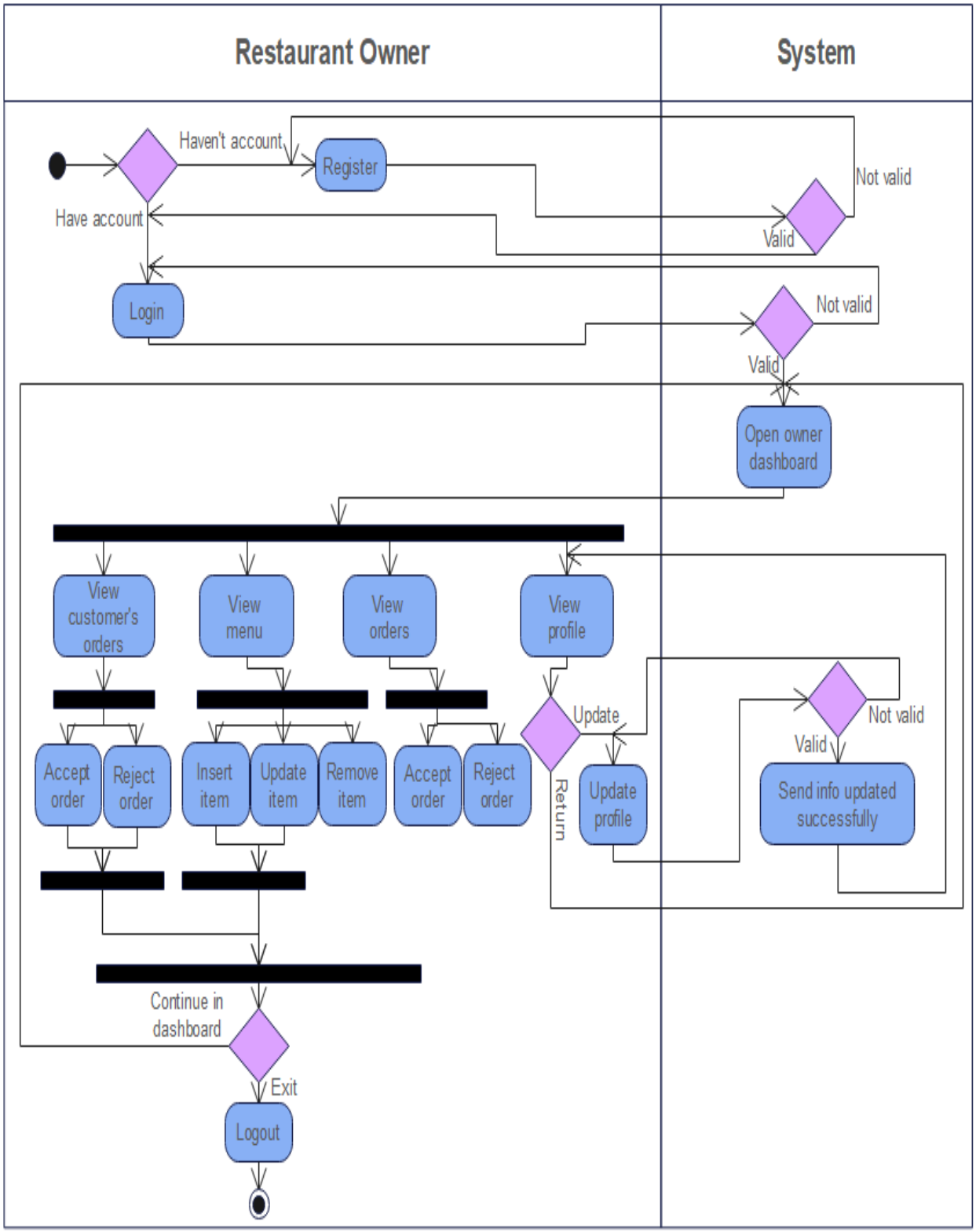

Admin
log out GUI
System
Select log out
Ask for log out
Log out done
Log out done
successfully

3.3 Activity diagram:

3.3.1 Customer activity Diagram:



3.3.2 Restaurant owner activity Diagram:



3.3.3 Admin activity Diagram: