

Cairo University

Faculty of Computers and Artificial Intelligence



CS251

Introduction to Software Engineering

Toffee

Software Design Specifications

Version 1.0

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Software Design Specification

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Software Design Specification

Team

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Document Purpose and Audience

- This document describes the detailed design of the Toffee e-commerce system, This document provides the team with a detailed description of the software design, including the system architecture, the software components, and the interfaces between the components and including its features, functionalities.
- Target Audience:
 - 1- Software developers
 - 2- Software testers
 - 3- Software architects
 - 4- Software designers



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System Models

I. Architecture Diagram

Main component

Catalog	It is the component that contains information about the products and services offered by the store. It includes details like product name, category, description, image, brand, price, and discount percentage.
User Management	manages user registration, login, and authentication.
Mobile Application	It is an optional component that allows customers to access the e-commerce store using a mobile device. It should support both Android and iOS platforms.
Admin Panel	It is a dedicated web application that allows the admin to manage the store's catalog, update item details, and view statistics. It also allows the admin to manage users, suspend or block them, and configure loyalty point schemes.
Order Management	It allows customers to view their order history and reorder previous orders. It also provides the admin with a view of all orders, their status, and other related details.
Payment Processing	It handles the payment transactions made by the customers using various payment methods like smart wallets, cash on delivery, or redeeming gift



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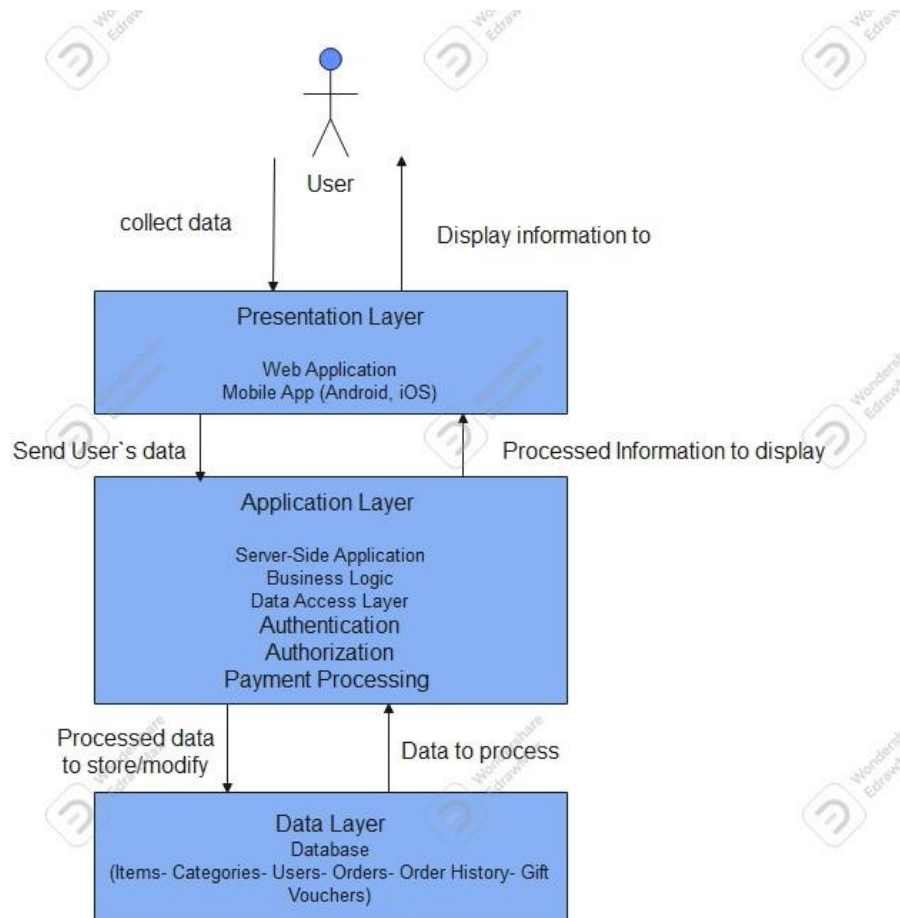
	vouchers and loyalty points.
Ordering	It is the process of purchasing the items in the shopping cart. It includes features like selecting shipping address, payment options, and applying gift vouchers or loyalty points.
Shopping Cart	It allows the customer to add items they want to buy and keep them until they are ready to check out.
Loyalty Points Management	Manages the loyalty points earned by users based on their purchases and the loyalty point's scheme.
Front-end	Provides the user interface for the customers and the admin to interact with the system.
Back-end	Contains the business logic and connects the front-end to the database.
Gift Voucher Management	Manages the gift vouchers purchased by users or issued by the system and their redemption.

3-tier architecture is suitable for an e-commerce system like Toffee. This architecture separates the presentation layer, application layer, and data layer, which provides scalability, modularity, and security.



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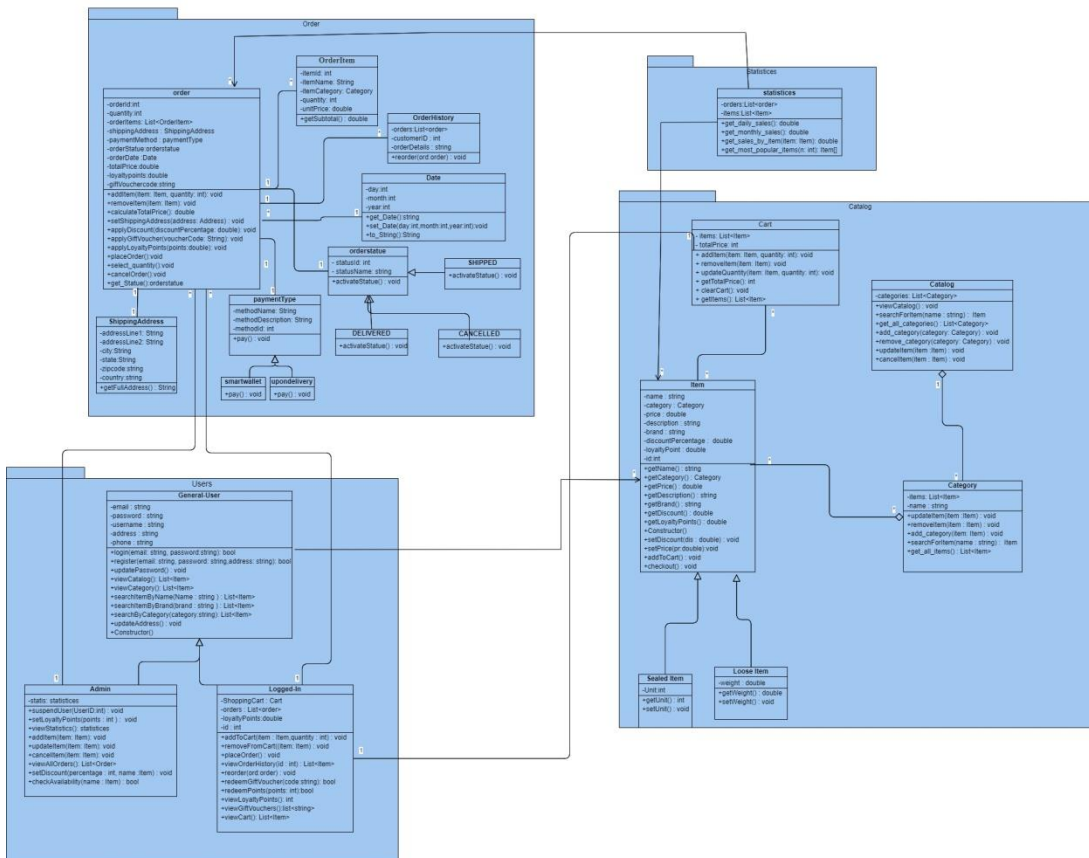




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II. Class Diagram(s)





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III. Class Descriptions

Class ID	Class Name	Description & Responsibility
1.	General User class	Represent a user in the system. Store and manage user account data (email, password, address, and username). Provide methods for user account operations (login, register, update password, update address, (view catalog, view Category, search item by name, search item by brand, search item by category and constructor).
2.	Admin Class	Represent an administrator user in the system. Store and manage admin account data, including user statistics. Provide methods for admin operations (suspend user, set loyalty points, view statistics, update catalog, view orders, set discount percentage, and check availability).
4.	Logged In User class	Represent a logged-in user in the system. Store and manage logged-in user data (shopping cart, orders, loyalty points, and ID). Provide methods for logged-in user operations (add to cart, remove from cart, place order, view order history, reorder, redeemGiftVoucher, redeemPoints, viewLoyaltyPoints, viewGiftVouchers and view cart).
5.	Statistics class	Responsible for calculating and storing various statistics related to the performance and sales of the online store, including daily and monthly sales, sales of each item in a period of time, and the most popular products.
6.	Item class	Responsible for storing information about an item, including its name, category, description, image, brand, price, and discount percentage.
7.	Catalog class	Store and manage information about all available items in the store, including name, category, description, image, brand, price, and discount percentage. Allow adding new items to the catalog and updating existing items. Allow deleting items from the catalog. Allow retrieving a list of all items in the catalog, or a subset of items filtered by category, name, or brand.
8.	Category class	Responsible for representing the different categories of items that are being sold in the online store. It contains information about the category's name, description, and a list of items that belong to that category. It is responsible for creating, updating, and deleting categories as needed. Additionally, it can be used to retrieve information about the items in a specific category
9.	Cart class	Responsible for managing the items selected by the user for purchase, storing them until the user is ready to check out, and calculating the total price of the items in the cart. It is also responsible for allowing the user to update the quantity or remove items from the cart as needed. Additionally, the Cart class may interact with the Item class to retrieve and update item information as items are added or removed from the cart



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Class ID	Class Name	Description & Responsibility
9.	Order class	This class can add item to order ,remove item from order , calculate the price ,apply discount ,apply the loyalty points , make the order , cancel the order ,select quantity
10.	Shipping address class	Select the address of the order
11.	Payment type class	Select the way to pay the order
12.	Date class	Can select the date of the order
13.	order status class	Responsible for the status of the order
14.	Order history class	View the order history of the customer and Can reorder the same order again
15.	Order item class	Responsible for the items of the order

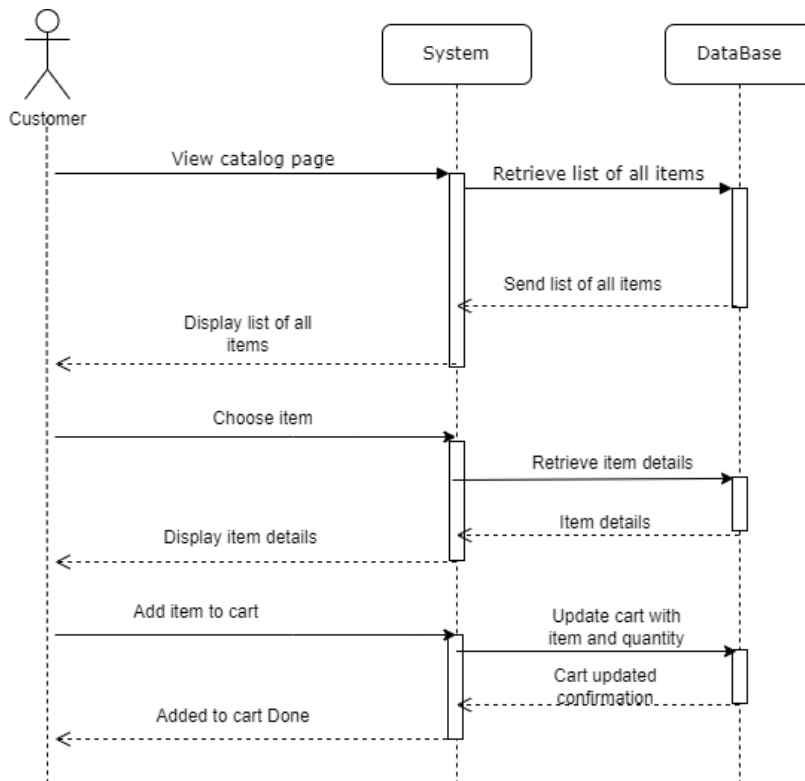


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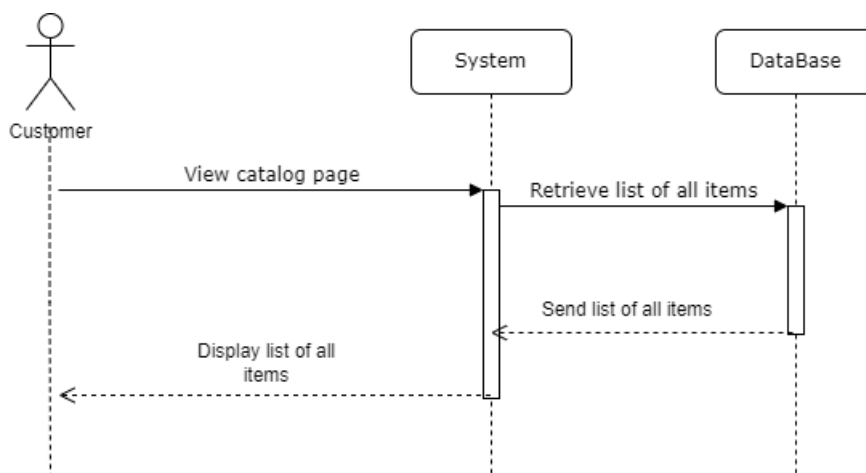
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IV. Sequence diagrams

1. Add item to cart



2. View catalog

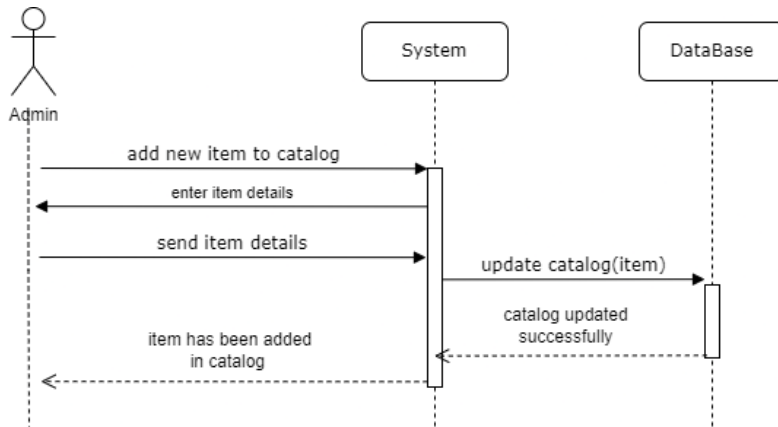




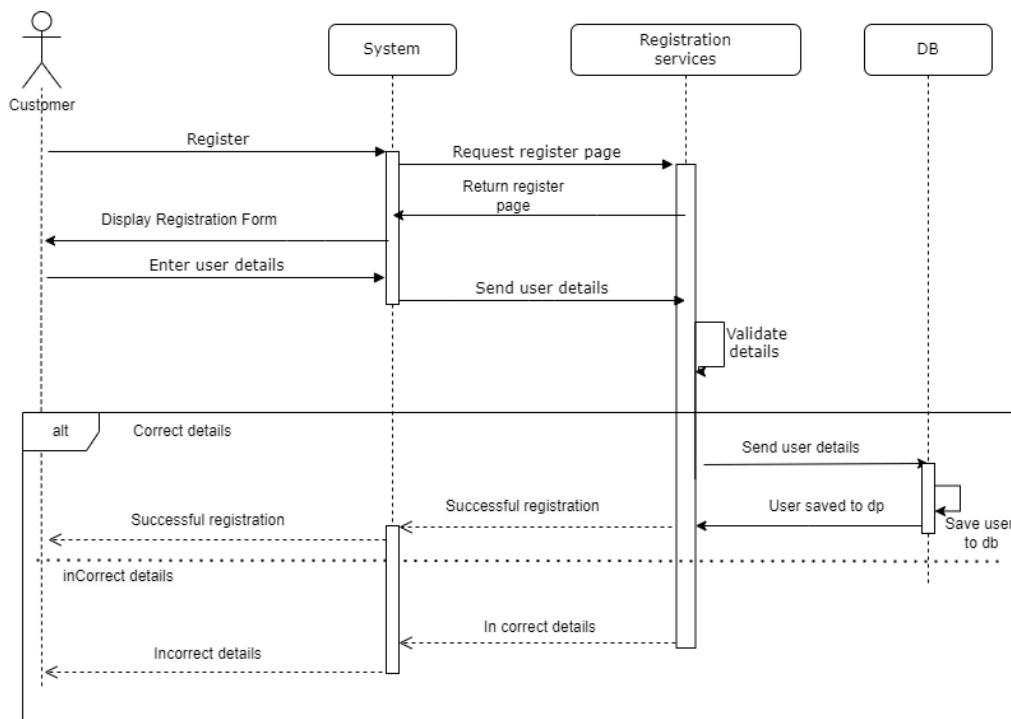
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3-Add item to catalog (admin)



4- Register

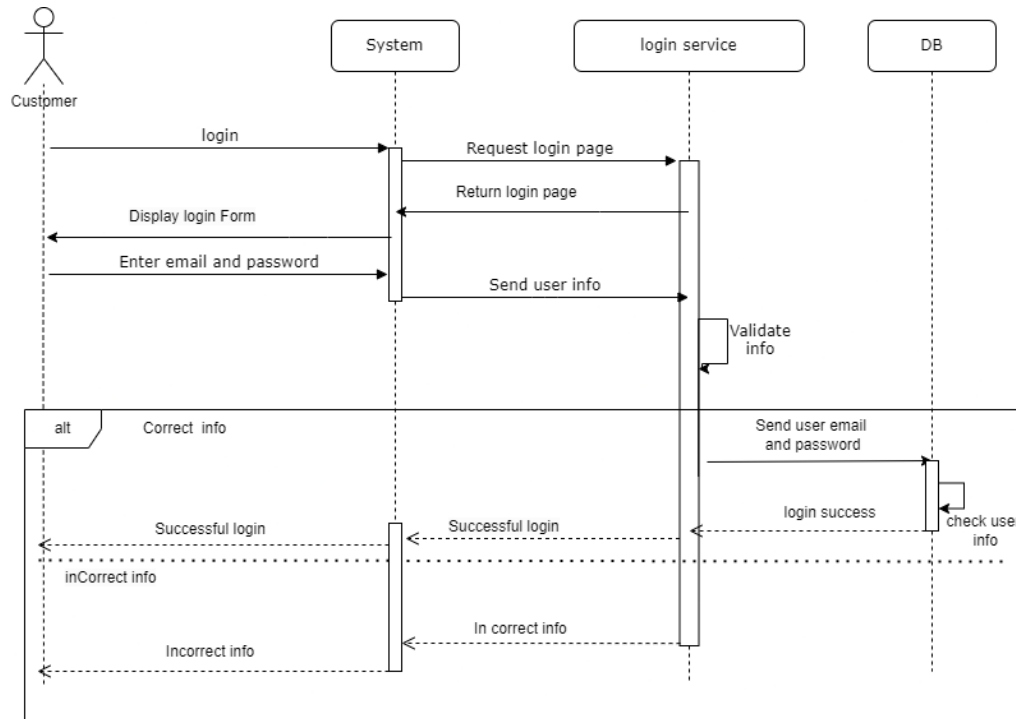




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5-Login

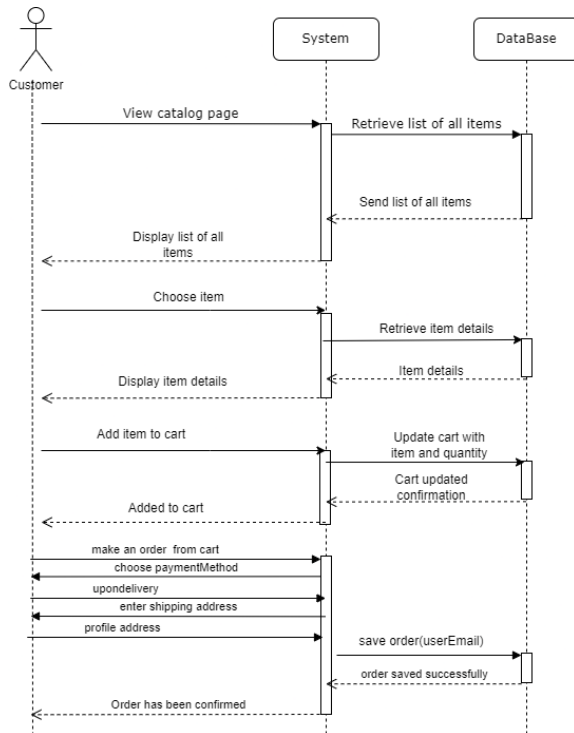




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6-Make order



Class - Sequence Usage Table

Sequence Diagram	Classes Used	All Methods Used
1. View catalog page	Class Catalog	view Catalog
2. Add Item To Cart	Class Catalog Class Item Class Cart	view Catalog add To Cart
3. Add item to catalog	Class catalog Class Item Class category	Add category View catalog
4. Register	Class user	Register
5. Login	Class user Class login user	Login

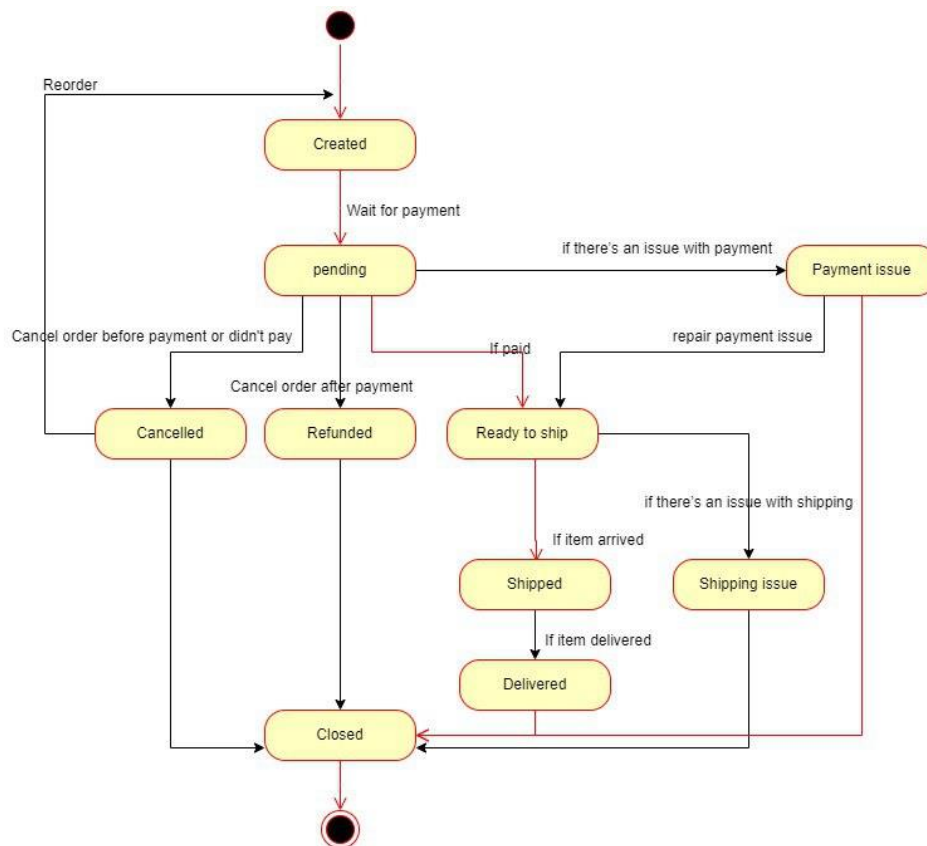


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Sequence Diagram	Classes Used	All Methods Used
6. Make order	Class order Class cart	makeOrder

State Diagram



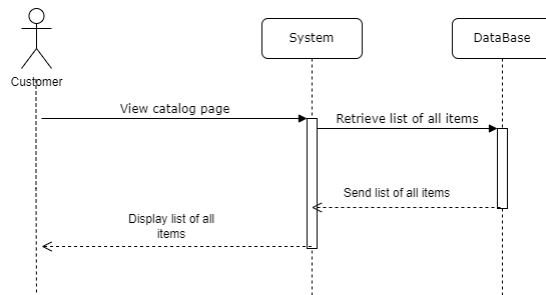


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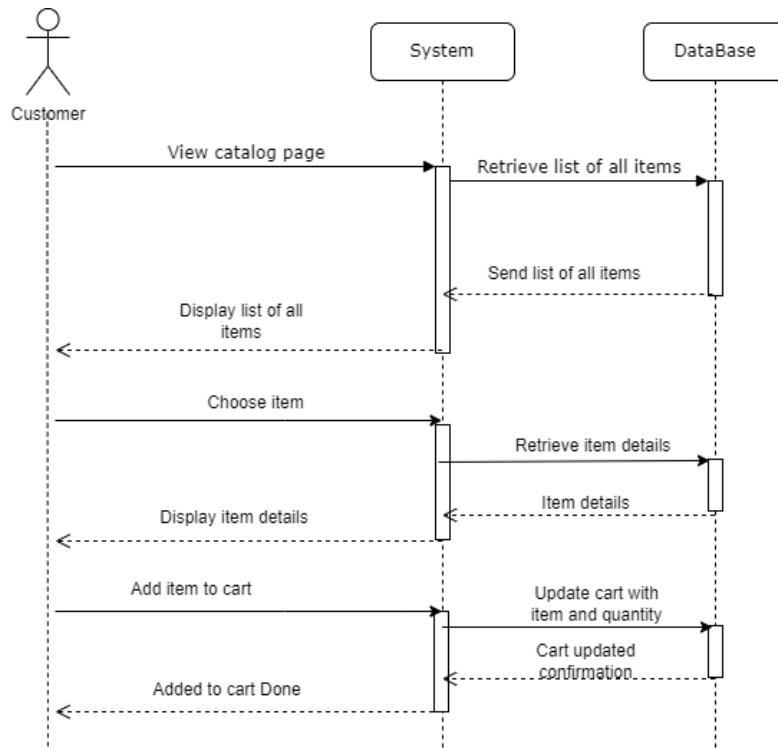
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Sequence diagram (code)

Display catalog



Add item to cart

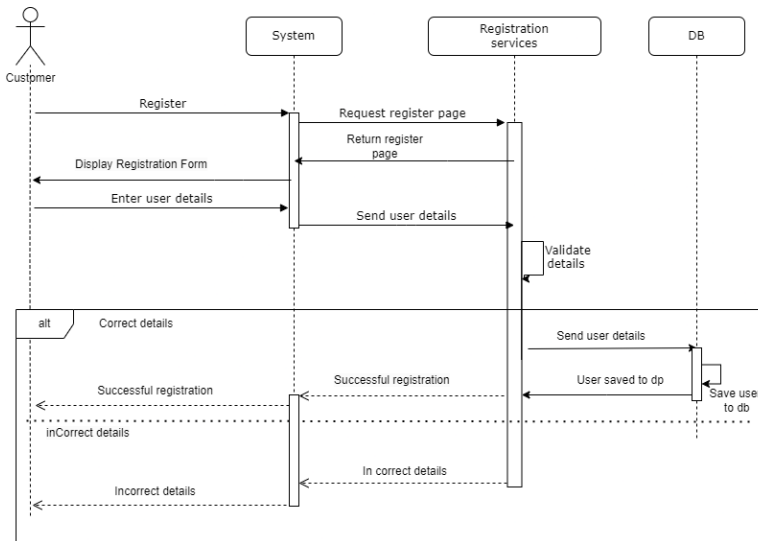




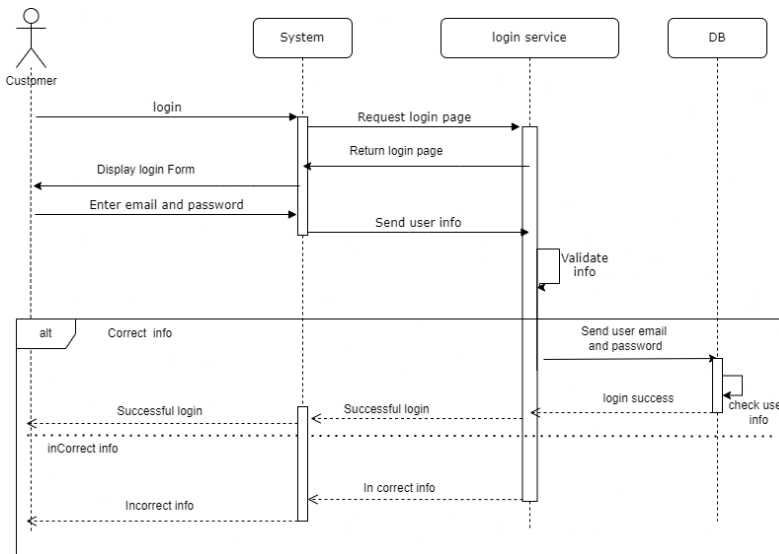
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Register



Login

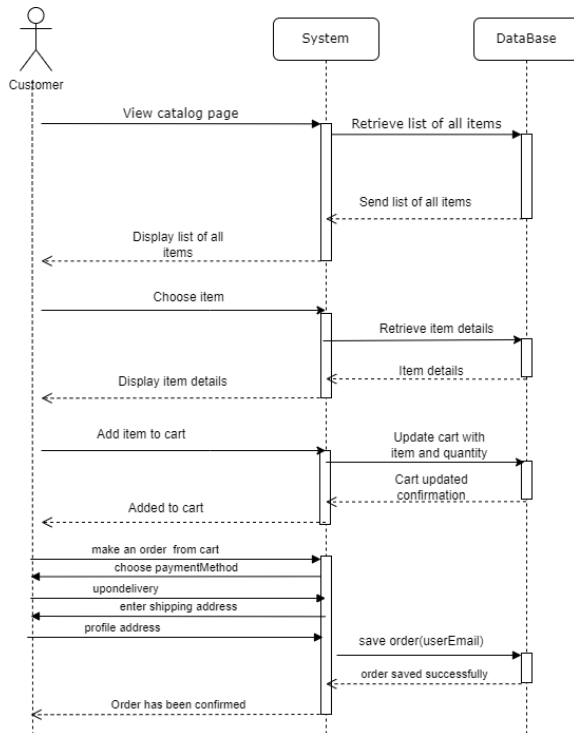




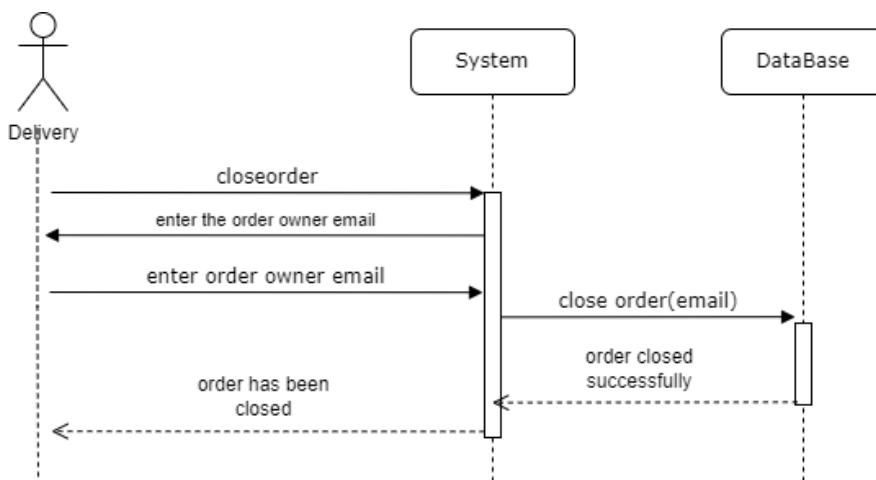
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Make order



Close order





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Tools

- draw.io
- Visual paradigm

Ownership Report

Student	Items he created
Mustafa Adel Khodary	Part of SDS
Mustafa Ahmed elrawy	Part of SDS
Mohamed Gamal Abdelmoneem	Part of SDS