Cairo University  
Faculty of Computers and Artificial Intelligence



**CS251**

**Introduction to Software Engineering**

YAO

Software Design Specifications

Version 0.0

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Name** | **Email** | **Mobile** |
| 20210502 | Yusuf Elsayed Abdelrahman Badr | [yusufbadr@yahoo.com](mailto:yusufbadr@yahoo.com) | 01063033085 |
| 20210251 | Alialdin Muhammad mostafa | Alialdin.mohamad@gmail.com | 01120765911 |
|  |  |  |  |

Month & Year

Contents

[Instructions [To be removed] 3](#_Toc133519910)

[Team 3](#_Toc133519911)

[Document Purpose and Audience 3](#_Toc133519912)

[System Models 3](#_Toc133519913)

[I. Architecture Diagram 3](#_Toc133519914)

[II. Class Diagram(s) 5](#_Toc133519915)

[III. Class Descriptions 6](#_Toc133519916)

[IV. Sequence diagrams 7](#_Toc133519917)

[Class - Sequence Usage Table 9](#_Toc133519918)

[V. State Diagram 9](#_Toc133519919)

[Tools 10](#_Toc133519920)

[Ownership Report 10](#_Toc133519921)

# Instructions [To be removed]

* **IMPORTANT. Rename this document to**

**CS251-2023-SectionNumber-TAName-LeaderID-DraftToffeeSDSv0.0.pdf for draft version**

**CS251-2023-SectionNumber-TAName-LeaderID-FinalToffeeSDSv1.0.pdf for final version**

* **Include it in a zip file with the code of the project**
* **Remove the following notes and any red notes**
* **This document is the template document for your Software Design.**
* **For further guidelines and information, READ homework 3, document, project description and sample SRS.**

# Team

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Name** | **Email** | **Mobile** |
| 20210502 | Yusuf Elsayed Abdelrahman Badr | [yusufbadr@yahoo.com](mailto:yusufbadr@yahoo.com) | 01063033085 |
| 20210251 | Alialdin Muhammad mostafa | Alialdin.mohamad@gmail.com | 01120765911 |
| 20210060 | Osama maher masoued | Osama392maher@gmail.com | 01020083229 |

# Document Purpose and Audience

* **Any document should tell the reader 2 things: (1) What is this document? (2) Who is expected to read it?**
* **Write in simple notes: what this document is.**
* **List the target audience to read this document (e.g. CEO? Project Manager? Customer? Developers, ...?)**

# System Models

## I. Architecture Diagram

* **Decide on suitable software architecture for this system. Describe the architecture you chose and why it is suitable for Toffee.**
* **Provide an architecture diagram showing the different components of the system and their relation to each other. Use suitable notation like C4 or arrow and box.**

## I. Architecture Diagram

1- Main Components or Subsystems:

1. Catalog Subsystem: This subsystem is responsible for managing the catalog of products that the system will offer. It stores product information such as name, category, description, image, brand, price, and discount percentage (if any). This subsystem will be updated by the admin
2. Authentication and Authorization Subsystem: This subsystem is responsible for user authentication and authorization. It ensures that only authenticated users are allowed to access the system and perform actions based on their role and permissions.
3. Shopping Cart Subsystem: This subsystem is responsible for managing the user's shopping cart. It allows users to add and remove items, update quantities, and view the total cost of their orders.
4. Order Management Subsystem: This subsystem is responsible for managing orders placed by users. It includes features such as order tracking, shipping, and payment processing.
5. Loyalty Points Subsystem: This subsystem is responsible for managing the loyalty points earned by users. It tracks users' points and allows them to redeem points for discounts or other rewards.
6. Gift Voucher Subsystem: This subsystem is responsible for managing gift vouchers. It generates unique codes for each voucher and allows users to redeem vouchers during the checkout process.
7. Reporting and Analytics Subsystem: This subsystem is responsible for generating reports and analytics on various aspects of the system, such as sales, inventory, and user
8. A suitable architectural design for e-commerce systems like Toffee could be a three-tier system consisting of

a) Presentation Tier: This layer provides the user interface for customers to interact with the system. It includes web pages, mobile apps, and other interfaces.

b) Application Layer: This layer is responsible for implementing the business logic of the system. It includes subsystems such as the Catalog, Authentication and Authorization, Shopping Cart, Order Management, Loyalty Points, and Gift Voucher subsystems.

c) DataBase Layer: This layer stores and manages customer data, product catalogs, orders, and other system information.

A picture containing text, screenshot, font, diagram

Description automatically generated

## II. Class Diagram(s)

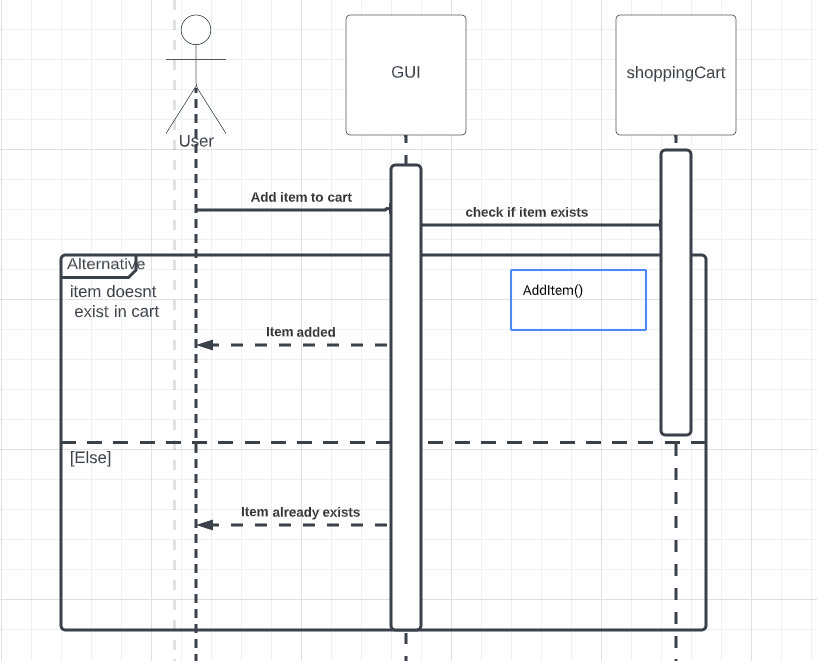
## III. Class Descriptions

| **Class ID** | **Class Name** | **Description & Responsibility** |
| --- | --- | --- |
| 1 | Items | Store all details about an item and can apply discounts or modify details |
| 2 | ItemStatus | Enumeration |
| 3 | UnitType | Enumeration |
| 4 | Inventory | To keep track of all items available |
| 5 | Users | Stores data about a single user while giving the option of changing these details. Payment authorization occurs here. Validation of email, password and OTP happens here as well. Reorder last order also available |
| 6 | PaymentMethod | Enumeration |
| 7 | Address | Stores address of the user |
| 8 | SystemUsers | Keeps track of all users registered on the system |
| 9 | Orders | Details about previous orders |
| 10 | ShoppingCart | Shopping cart of each user with the option of changing its contents |
| 11 | Admin | Gives certain privileges to admins assigned by owner |
| 12 | Owner | Full privileges of admins with the extra privilege of assigning or removing admins |

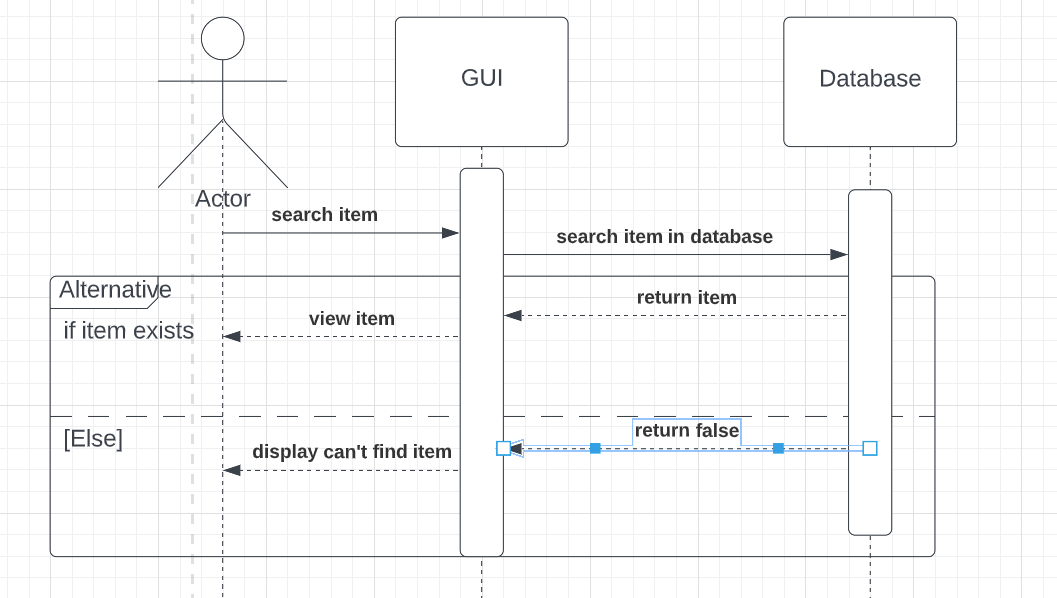
## IV. Sequence diagrams

* **Usually each use case is represented by a sequence diagram or more.**
* **Draw a sequence diagram for the most important SIX use cases (user stories) that have complex interaction.**
* **Overall, all the diagrams should represent all requirements and possible flows for the use case.**
* **Make sure that each object in the sequence diagram has a corresponding class in the class description table above. If not, it will be REJECTED.**
* **Put actual function calls with proper parameters and return types corresponding to class diagrams.**
* **Following are couple of examples for small / medium examples. We expect such diagrams, however there is a missing thing in them. Most of calls don’t have parameters. Please always specify the parameters in the call, matching the class diagram.**

Adding items to cart

****

Searching an item

****

### Class - Sequence Usage Table

* **In this table, we will list the sequence diagrams you drew. For each one, list all the classes used in this sequence. For each class list all the methods you used in this class. Every method or object on a sequence diagram must belong to an existing class in the class diagram and be shown there. If sequence diagrams do not reflect actual classes and methods, they will be REJECTED.**

| **Sequence Diagram** | **Classes Used** | **All Methods Used** |
| --- | --- | --- |
| 1. Book Field | Class Field  Class Player | Methods …..  Methods …. |

## V. State Diagram

* **For the order object, draw a state diagram to show the developer the different states it can be in. (for example it is initially created, then it can be shipped, cancelled (if cancelling is possible), …., etc.)**

# Tools

* **Write a list of all tools used to develop the design (e.g., ArgoUML, Visual-Paradigm, etc.)**

# Ownership Report

* **Remove the following notes and any red notes**
* **For every item in this document, write the owners. If someone is owner of something, s/he understands it 100%.**
* **Team leader must verify the table with the team members.**

|  |  |
| --- | --- |
| **Item** | **Owners** |
| Class Diagram + Class Descriptions | Yusuf Elsayed Abdelrahman Badr |
|  |  |
|  |  |