Faculty of Engineering
Ain Shams University

CSE241 Object Oriented Programming – 1ⁿᵈ Semester 2024/2025

       This project is a group project, each group will be **4** students. Each group will deliver a written report in addition to the developed code by the end of the project that shows the detailed analysis, design, testing, etc. of the project and the description of the used techniques, problem description, detailed solution, limitations, sample output, references, and any additional information related to the project. Online demo**(YouTube)** video and discussion will be conducted by the end of the project.

Project Deliverable

The following are required to be delivered by the due date, all deliverables must be uploaded to LMS by the due date, and no other methods can be used to send your files:

-    **Project code** must be submitted as a zip/rar archive, it must contain all the files that allow us to run it in addition to the source code.
-    **Project document** (in .pdf format) that contains at least the sections stated above.
-    A **GitHub** link(you will provide), has all files and documents mentioned above. " Prepare it well for you :) "
-    A **YouTube video** (Demo) that illustrates the project's use.

Project Title: Desktop E-commerce

Project Overview:

Create Desktop e-commerce in Java, focusing on Object-Oriented Programming (OOP) principles in the first milestone and incorporating Graphical User Interface (GUI), Multi-threading, and basic networking in the second milestone.

Milestone 1: OOP Foundations   [13 marks]   10/12/2024

Objective:

Implement the core structure of the e-commerce backend system using OOP principles.

Key Features:

Customer:
- Model customer profile using OOP principles, including attributes like username, password, date of birth, balance, address, gender(enum) and Interests.

Admin:
- Model Admin profile using OOP principles, including attributes like username, password, date of birth, role and working hours.
- show all (users - products - orders)

Categories and Products:
- Design classes for representing Category and Product.
- Implement methods for CRUD operations for the admin.

Cart and Order:
- Design classes for representing Cart and Order.
- Support variety of payment methods for the order.

Validation:
- Use OOP principles for encapsulating data, and validate every operation that will help the business..

Database:
- Create a class that will act as a database to store your data, create static array-lists for each entity in your project

- Feel free to create dummy data for all entities while initializing your project, so we can test your project.

Deliverables:

- UML diagrams illustrating class relationships and hierarchies.
- Use Interfaces/abstract classes (contract) so you can skill up your project later
- Concrete classes for customer/admin, products, cart and orders.
- Basic functionalities for user registration, login, add to cart and place orders.

Milestone 2: GUI, Multi-threading, and Network Basics   18/12/2024

Objective: [7 marks]

Enhance the application by incorporating a graphical user interface (GUI), using multi-threading for real-time updates, and setting up basic networking for communication.

Key Features:

Graphical User Interface (GUI):
- Create an interactive and user-friendly GUI using Java's Swing or JavaFX.
- Design screens for user registration/login, user cart, products/categories menu, and orders.

Basic Networking:
- Set up a simple client-server architecture for users to chat with admin using Sockets and threads.

Deliverables:

- Fully functional GUI with screens for user registration/login, user cart, products, orders, CRUD operations on products for the admin.

- Create test cases to test your project and put them inside your report

- Use sockets and threads for client-server communication.

- Discussion   [5 marks]

Bonus   [2 marks]

- Add valid/invalid test cases for your project
- Divide your source code to be in layers ex : [DataBase -> Entity - > DAO -> Service] packages
- Show more analysis inside the admin dashboard.

- Enhance the GUI with additional features such as search functionality.

- Show more analysis inside the admin dashboard.