AMERICAN UNIVERSITY OF BEIRUT
MAROUN SEMAAN FACULTY OF ENGINEERING & ARCHITECTURE

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
EECE 351 - Computing Networks and Services

Network Programming Project

AUBoutique - Phase I

Due 11:59 pm on October 25, 2024

Team Guidelines

- This is a team project. Teams can consist of two or three students.
- Team members are expected to put a balanced effort on the development of the different parts of the project.
- One team member will be in charge of submitting the project deliverables (code and report) on Moodle.

Project Deliverables

- Full source code of the project with documentation.
- Project report, consisting of a maximum of six pages and two appendices, as per the following:
  - Cover page listing the team members (names, ID numbers, emails) and the workload distribution (in percentage of individual effort to total effort.)
  - Description of the system architecture and the protocol used between communicating entities.
  - A tabular presentation of all the project features indicating the ones that are successfully or partially implemented.
  - Description of the implementation of the different functionalities.
  - One appendix that includes snapshots of the application depicting the main features.
  - One appendix that includes a table showing a breakdown of the project tasks. Indicate next to each task the name of the team member who was mainly responsible for its implementation.
- Project demo to present the application and all implemented features.

General Description

In this project, you are required to design and implement AUBoutique, an online marketplace for the AUB community. **AUBoutique** is a user-friendly platform that facilitates the buying and selling of a variety of products including craftwork, textbooks, collectibles and others. The platform starts as a simple online marketplace that provides the basic features of account management and selling and buying products, then it evolves to a more advanced platform with creative features and a user friendly graphical user interface.

In the first phase of the project, the aim is to develop the basic functionality of AUBoutique using a client-server architecture. The clients (users of the platform) create user accounts and log in to the centralized server. Every user can be a buyer or a seller. If willing to sell a product, the user adds the product by providing a name, a picture, a price, and a brief description. If interested in buying a product, the user browses the list of sellers and their items then selects the item to buy, confirms its payment, and sees a confirmation message to collect the item from the AUB Post Office on a certain date. The platform should support multiple users interacting with the server simultaneously.

Implementation of Basic AUBoutique

For the first phase of the project, you will need to design the AUBoutique *protocol* that is used between client and server, and to implement client and server using Python, as described below.

Client - Design and implement the client with the following functionalities:

- The user opens the client application and connects to the server application using the server domain name and port number.
- The user is given the option to register or to log in.
- If the user is not registered, they can sign up and provide the server with name, email address, username, and password.
- In the case of a registered user, the user logs in with their existing account where the server performs authentication by verifying the username and password.
- When the user is authenticated, they get a list of products for sale together with the owner of these products.
- The user can view products of a particular owner.
- The user can check if the product owner is online and initiate text communication with them through the server.

- The user can select products and buy them. A confirmation message will be displayed asking the user to collect the products from the AUB Post Office on a certain date.
- The user can also add products to the marketplace. For each product, the user provides a name, picture, price, and description. Assume the count of each product is only one, so it can be bought once.
- The user can view the buyer of each of their products.

Server - Design and implement the server with the following functionalities:

- The server takes as a command line argument the port number on which it would be listening.
- The server allows the users to register and log in.
- Every time a new user signs up for a new account, the server adds a new user with their information and credentials.
- Every time a user logs in, the server authenticates them by verifying their username and password.
- The server application manages a database that stores user accounts and products.
- The server keeps track of online users and relays text messages between the seller and buyer, provided both of them are online.
- The server serves multiple clients simultaneously.