Operating Systems

Value – 20%

Project

Your project is to write a **Multi-threaded TCP Server** Application, which allows multiple users to be registered, login and trade football players. The Application should provide the following functions for the client applications:

1. Register with the system (Note There is two types of users: Player Agents and Clubs)
    - Clubs have the following details (**Note: The same club name and id can only be registered once)**
        i. Name
        ii. Club ID
        iii. Email
        iv. Funds Available for transfer
    - Agents have the following details (**Note: The same agent name and id can only be registered once)**
        i. Agent Name
        ii. Agent ID
        iii. Email
2. Log-in to the player transfer system from the client application to the server application.
    - Note: The log in is based on the club's or the agent's name and id
3. Once logged in the agent would be able to:
    - Add a player with the following details (Note when adding a player profile the server should assign a unique player ID).
        i. Name
        ii. Age

iii. Player ID
iv. Club ID
v. Agent ID
vi. Valuation
vii. Status
    1. For Sale
    2. Sold
    3. Sale Suspended
viii. Position
    1. Goalkeeper
    2. Defender
    3. Midfield
    4. Attacker

- Update the player's valuation.
- Update the player's status.

4. Once logged in the club would be able to:
    - Search for all players in a given position.
    - Search for all players for sale in their club
    - Suspend/Resume the sale of a player in their club.
    - Purchase a player. When a club tries to purchase a player the following must be checked:
        1. That the player must be valid.
        2. The club has the funds required and the player is for sales.
        3. If points 1 and 2 are true then:
            - The player's status changes to sold.
            - The player's club ID should change to the new Club ID
            - The purchasing club's balance should reduce by the valuation.
            - The selling club's balance should increase by the valuation.

Server Application Rules

1. The server application should not provide of options listed in point 3 & 4 to a client application that can not complete the authentication.

2. The server should hold a list of valid agents and clubs of the service and a list of all the players registered with the systems.
3. All of client applications should be able to see all the users and players added by all the client applications.
4. The server should keep a file(s) back-up of the list of agents, club and players. This file backup is used to initialise the contents of the list when the server restarts.

Project Submission

Each student should submit the code developed to support both the server and client sides of the application (**Note: The code must be written in Java**). In addition to the code each student should submit a document explaining the various design decisions that were made during the project and how their code works. Finally, a screencast should be included in the submission demonstrating the **complete** functionality of the solution.

Submission Deadline

Project Submissions to be submitted to martin.hynes@gmit.ie by 11.59pm on the 5th January 2020.

Points to Note

- Comments expected.
- Good programming practice is expected
- Ensure that any files that are needed to run the program are included in your submission.
- Your code has to run. Serious deduction of marks will occur for code that is not running correctly.
- Plagiarism is not acceptable.
- You may be asked to present your code/application.