COSC 439: Operating Systems Project

Title: Multicomputer Tic Tac Toe Game Development

Objective: The objective is to develop a multi-player Tic Tac Toe game that operates across multiple computers in a local network using only **socket/pipe/RPC** programming. While input via a text file or directly in the terminal is permissible, it may result in a deduction of points. The team is expected to implement some form of UI/interface for user input. Therefore, the project can be executed using any programming language. However, the communication data transfer must be accomplished exclusively through socket/pipe/RPC programming, as any other methods are not permitted.

Features to Implement using socket/pipe/RPC:

1. Communication Setup: Implement socket/pipe/RPC programming to enable communication among multiple computers within the local network for gameplay. All the data sharing or transfer will be done using the socket/pipe/RPC.
2. Game Initialization: Develop a system to initialize and start the Tic Tac Toe game across the connected computers.
3. Multiplayer Functionality: Enable multiple players from different computers to take turns in the game.
4. Real-Time Gameplay Updates: Implement real-time updates across connected computers to reflect the current state of the game.
5. Display the game result (win/lose/draw) to all connected computers at the end of each game.

Requirements:

1. **Progress Report:** Submit a progress report outlining encountered challenges, how you have solved them, the current status, and forthcoming steps. Upon submission, feedback will be given for project adjustment based on the provided feedback. **(1 pt)**
2. **Code Implementation:** Develop a functional multi-computer Tic Tac Toe game entirely relying on socket/pipe/RPC-based communication for all listed features **(6 pts)**.
3. **Technical Report:** Prepare a detailed report that includes **(5 pts)**:
    - **Introduction to the Project:** Define objectives, importance in local multiplayer gaming, and the scope of the game based on socket/pipe/RPC programming.
    - **Features Description:** Detail each implemented feature and its significance in facilitating a multiplayer Tic Tac Toe game.
    - **Implementation Details:** Discuss technical insights, challenges faced, and significant decisions made.
    - **Conclusion:** Summarize key findings.
4. **Presentation:** In peron presentation that focuses on the technical aspects of the project. Utilize PowerPoint slides to highlight project goals, algorithms employed, implementation details, evaluations, challenges encountered, and insights gained. Additionally, ensure the presentation includes a live demonstration of the project to provide a practical illustration of its functionality. **(5 pts)**
5. **Retrospective and Contribution Report:** Reflect on the Operating Systems (OS) course, summarizing significant lessons learned, their practical relevance, and their impact on understanding OS principles. Additionally, list your own contributions as well as those of your teammates towards the project. **(1 pt)**

Deadlines:

- **Progress Report:** November 17, 2025
- **Presentation and Demo:** December 3–8, 2025 (In person)
    - Presentations will take place in the professor's office (YR 456) or in the library (YR 454).
    - Each group will present together, and all group members must be present.
    - The professor may ask questions or request modifications to the project or source code to verify that the work was done by the students and not generated by GenAI or copied from online sources.
    - Time slots will be provided via Calendly, and students should book a slot according to their convenience.
- **Source Code Submission:** December 8, 2025
- **Technical Report:** December 11, 2025
- **Retrospective and Contribution Report:** December 11, 2025