Progress Report

Date: 2025-02-26

Team: 21

Members:

- ➢ Mandira Samarasekara 34542282
- ➢ Mack Bourne 50943968
- ➢ Aakash Tirathdas 19000413
- ➢ Kyle Thaw 55087035
- ➢ Amirparsa Aminian 41202862

This report provides an update on the progress of our Java-based Game Player for the Game of the Amazons, which will compete against other teams via a game server. We are currently approximately 40% through the project, having made significant progress in server communication, move generation, and research on AI algorithms.

Progress Overview

Server Communication Setup (Completed)

- Mandira and Mack successfully set up the Maven project.
- Ensured dependencies were installed and the server connection was established within the first two labs.
- Ran initial tests using COSC322Test.java to verify server communication.
- Debugged and resolved early connection issues.

Game Rules and Move Generation (In Progress)

- Mandira, Mack and Kyle have implemented move validation to ensure legality.
- Developed functions for generating all possible legal moves.
- Currently optimizing move generation for better efficiency.
- Next step: Fine-tuning move selection logic.

AI Algorithm Research & Development (In Progress)

- Aakash and Parsa researched Minimax with Alpha-Beta Pruning and Monte Carlo Tree Search (MCTS).
- Decided to implement Minimax with Alpha-Beta Pruning as the primary algorithm.
- Initial implementation in progress.
- Next step: Testing and fine-tuning evaluation functions.

Heuristic Evaluation Function (In Progress)

- Impenting Min-Distance Evaluation Function.
- Working on additional heuristics such as:
    - Mobility heuristic: Evaluating available moves.
    - Board control heuristic: Strategic positioning of pieces.
- Next step: Optimizing and testing heuristics for improved AI performance.

Documentation & Report Writing (In Progress)

- Mandira has been tracking team progress and writing documentation.
- Maintains logs of challenges and solutions encountered.
- Next step: Preparing the final project report and methodology.

Challenges Encountered

- Server Communication Issues
    - Early debugging was required to establish a stable connection with the game server.
- AI Search Depth Optimization
    - Balancing search depth and performance has proven challenging, requiring further testing.
- Move Generation Efficiency
    - Some inefficiencies were identified and are currently being optimized.

Plan for the Next Month

Task	Assigned to
Finalize Move Generation	Maddy, Kyle
Optimize AI Heuristic Functions	Aakash, Parsa
Test and Debug AI	Aakash, Parsa,Mack
Full System Testing	Mack Kyle
Prepare Project Documentation	Maddy
Tournament Preparation	All Members