MS3 Report

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Vision

Our vision for this project is to create a versatile and modular gaming platform in OCaml that features both Ultimate Texas Hold'em and Blackjack. By leveraging common functionalities such as card dealing, betting systems, and user interfaces, we aim to deliver an engaging and educational experience for players of both games. Initially, our plan focused solely on Texas Hold'em, but recognizing the potential for modularity, we expanded our vision to include Blackjack. This evolution allows us to maximize code reuse and streamline development, ultimately providing a robust and comprehensive gaming platform.

Summary of Progress

The team met together and developed a vision and plan for the project. We wanted to build a playable single-player Poker game like Texas Hold’em.

We first implemented the representation of cards and decks. A card is represented by its rank and suit. A hierarchy of cards was implemented, and the printing of cards and decks, both concisely and artistically, was implemented. We then implemented many aspects of Poker game logic, such as how to draw hands for a player, then draw a flop, turn, and river. Then, we implemented functions to evaluate hands, by taking the river and the player hand and identifying the hand ranking (straight flush, full house, etc.). Last, we implemented starting the game and making the user interface look nicer.

We successfully implemented the game logic for Texas Hold'em, including card dealing, managing bets, and determining the winner based on hand rankings. This involved creating functions for dealing cards and managing the betting system, as well as developing a robust hand ranking algorithm. Additionally, we built a basic user interface that allows players to interact with the game seamlessly.

As a demonstration of the modularity of our implementation, we made a Blackjack game using the similar build process as the one we did for Texas Hold'em. Since we already know how that development process works, we did that relatively quickly.

Activity Breakdown

Nicholas (10 hours)

- Wrote test cases for Ultimate Texas Hold'em
- Helped implement Blackjack
- Playtested and debugged Ultimate Texas Hold'em
- Wrote testing plan

Mehdi (10 hours)

- Debugged hand evaluation functions
- Wrote test cases for hand evaluation
- Wrote test cases for Blackjack
- Factored data into json file
- Playtested and debugged Ultimate Texas Hold'em

Jerry (10 hours)

- Wrote MS3 report
- Refactored code so that it was up to style guidelines
- Updated decision structure of Ultimate Texas Hold'em implementation
- Playtested and debugged Ultimate Texas Hold'em

Ryan (10 hours)

- Implemented first version of Ultimate Texas Hold’em
- Improved on hand evaluation and comparison algorithms
- Created test cases for hand evaluation
- Conducted research on rules of Ultimate Texas Hold’em
- Playtested and debugged Ultimate Texas Hold’em

Gavin (10 hours)

- Conducted research on rules of Blackjack
- Helped implement and test Blackjack
- Playtested and debugged Ultimate Texas Hold’em
- Wrote test cases for hand evaluation and deck function
- Contributed to documentation and game logic

Productivity Analysis

As an entire team, our productivity had its highs and lows during this sprint. We successfully implemented the core functionalities for Ultimate Texas Hold'em, which was a significant milestone. However, our initial estimates were not very accurate. Originally, we planned to create an AI using Counterfactual Regret Minimization (CFR), but we soon realized that training decision trees in OCaml was not a feasible approach. This forced us to pivot our focus. Next, we attempted to work on a server for multiplayer functionality, but our lack of experience with the Lwt library posed significant challenges, as many of us had not worked extensively with it before. Consequently, we decided to prioritize developing single-player versions of our games. While this shift allowed us to make progress, it also highlighted the need for more realistic planning and better assessment of our technical capabilities.