CSC466 Sequence of Plans

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First Plan- February 9th, 2023

Task 1- Model Board

Task 2- Establish consecutive order of board elements

Task 3- Write rules for single move

Task 4- Establish game rules, such as how each move works in turn and the end state

Task 5- Establish random player

Task 6- Interface for human vs random player and random player vs random player

Task 7- Establish basic heuristic player

Task 8- Test heuristic vs random player

Task 9- Genetic Algorithm Part 1- Mutation and Crossover

Task 10- Genetic Algorithm Part 2- Fitness Metric, Individual, and Population

Task 11- Genetic Algorithm Part 3- Copy Operation and Incorporating all elements into complete genetic algorithm

Task 12- Analyze genetic algorithm results and develop heuristics based on results (note: this task will likely result in text rather than code)

Task 13- Implement any heuristics developed in Task 12

Task 14- Test Heuristics against one another

Task 15- Reflection

Second Plan-February 26th, 2023

Note: this is a major change in the project goals, as the plan to work with a genetic algorithm for analysis has been replaced with a plan to use minimaxing to develop more skilled Mancala player machines.

Task 1- Model Board

- Task 2- Establish consecutive order of board elements
- Task 3- Write rules for single move
- Task 4- Establish single random move
- Task 5- Establish game rules, such as how each move works in turn and the end state
- Task 6- Interface for human vs random player and random player vs random player
- Task 7- Establish heuristic player 1- player will favor moves that allow an additional turn
- Task 8- Test heuristic vs random player
- Task 9- Establish heuristic player 2- player will determine which move will gain the most points
- Task 10- Minimax Part 1- modeling node and evaluation mechanic
- Task 11- Minimax Part building minimax trees
- Task 12- Test minimax player against random player and against heuristic players
- Task 13- Build holistic interface for human player to play against any machine

Task 14- reflection

Third Plan- March 5th, 2023

This is a relatively minor change, adding a task and shifting contents of a couple of tasks

Task 1- Model Board

- Task 2- Establish consecutive order of board elements
- Task 3- Write rules for single move
- Task 4- Establish single random move
- Task 5- Establish game rules and interface for random vs random player
- Task 6- Establish interface for human vs random player
- Task 7- Establish code to predict outcome of a given move without changing board
- Task 8- Establish heuristic player 1- player will favor moves that allow an additional turn
- Task 9- Establish heuristic player 2- player will determine which move will gain the most points
- Task 10- Test heuristics vs random player
- Task 11- Minimax Part 1- modeling node and evaluation mechanic
- Task 12- Minimax Part building minimax trees
- Task 13- Test minimax player against random player and against heuristic players
- Task 14- Build holistic interface for human player to play against any machine

Task 15- Reflection

Fourth Plan- April 2nd, 2023

Some minor adjustments have been made for this plan. The holistic interface, previously in task 14, has been completed as part of task 10. An additional task has been added if time permits: creating and testing an additional heuristic in task 14.

Task 1- Model Board

- Task 2- Establish consecutive order of board elements
- Task 3- Write rules for single move
- Task 4- Establish single random move
- Task 5- Establish game rules and interface for random vs random player
- Task 6- Establish interface for human vs random player
- Task 7- Establish code to predict outcome of a given move without changing board
- Task 8- Establish heuristic player 1- player will favor moves that allow an additional turn
- Task 9- Establish heuristic player 2- player will determine which move will gain the most points

Task 10- Test heuristics vs random player and build holistic interface for human player to play against any machine

- Task 11- Minimax Part 1- modeling node and evaluation mechanic
- Task 12- Minimax Part 2- building minimax trees
- Task 13- Test minimax player against random player and against heuristic players
- Task 14-Establish and test third heuristic player that will find the longest move
- Task 15- Reflection

Fifth Plan- April 2nd, 2023

Due to some difficulties generating moves, minimax has been extended an extra week. As a result, the additional heuristic has been removed.

Task 1- Model Board

- Task 2- Establish consecutive order of board elements
- Task 3- Write rules for single move
- Task 4- Establish single random move
- Task 5- Establish game rules and interface for random vs random player

Task 6- Establish interface for human vs random player

Task 7- Establish code to predict outcome of a given move without changing board

Task 8- Establish heuristic player 1- player will favor moves that allow an additional turn

Task 9- Establish heuristic player 2- player will determine which move will gain the most points

Task 10- Test heuristics vs random player and build holistic interface for human player to play against any machine

Task 11- Minimax Part 1- modeling node and evaluation mechanic

Task 12- Minimax Part 2- move generation

Task 13- Minimax Part 3 - minimax tree

Task 14- Test minimax player against random player and against heuristic players

Task 15- Reflection