Problem Description

No one will play Clue with me

Solution Proposal

Make the computer play with me

Technical Overview

Make a game of clue that Supports at least one player to play against at least one other AI Player.

The AI player can be two different difficulties: Easy, when the AI only makes deductions when a card is shown to them or no one disproves them, and Hard, when the AI makes deductions based on who doesn’t answer and who does as well as when a card is shown to them or no one disproves them

Each player should have the ability to take notes, view their cards and move around the board

Class Structure

* + Game
    - Board
    - vector<Piece>
    - vector<Player>
    - Array [3] Card
  + Card(Type, name)
    - Type // Character, Weapon, or Room
    - Name // Mr. Green, Pipe, Conservatory
    - Draw()
  + Player (vector<card>, color)
    - Piece
    - vector<Card>
    - Note Card // Not sure what to do with this. vector?
    - Virtual Guess() // the inside of this method greatly depends on how we run the game
    - FinalAccusation()
    - RollDice()
    - TakeTurn() // might be virtual
  + AI // inherits from Player
    - Bool hard // true is Hard, false is easy
    - Guess()
  + Human // inherits from Player
    - Guess()
  + Piece
    - X
    - Y
    - Color
    - Draw()
    - Move()
  + Notecard
    - Draw()
    - vector<vector<string>> // rows: cards, columns: players
      * // not bool unless null values are a thing in an array of bools
    - String otherNotes
  + Board
    - BoardWidth //square
    - CellWidth // also square
    - vector<vector<Cell>>
    - Draw()
  + Cell
    - Room // enum type. WalkWay, billiard room, kitchen, Hall …

// Movement cost from room cell to room cell is 0 else 1

* + - OccupiedBy
    - Draw()

Milestones

|  |  |  |
| --- | --- | --- |
| Due Date | Task | Goal |
| Jan 24 | Pseudo Code Main.cpp  Write+Pseudo Game.h and .cpp  Write Board and Cell .h and .cpp | Completely understand how the game will run and Draw the Board |
| Jan 31 | Write Piece.h and .cpp  Write Card.h and .cpp  Update Game.h .cpp and main.cpp | Be able to see board and pieces. Enum Cards names in Card.h (organized in ppl weapons, and rooms) Display the 3 cards picked  Enum Colors in Piece.h |
| Feb 7 | Write Player.h and .cpp  Write Human.h and .cpp  Update Game.h .cpp and main.cpp | Should be able to see last weeks board after a ?start screen? User should be able to define how many (human) players there will be, pick color, and be able to move their character based on click (take turns and roll dice) |
| Feb 14 | Write Guess() in Player and Human catch up on any details missed. | The game should be playable with only humans. At the beginning of each of his turns the player will see pertinent info regarding who guessed what and who answered or didn’t answer said guess. |
| Feb 21 | Write the Notecard.h and .cpp  Update Game.h .cpp and main.cpp | Be able to see and change values inside the notecard. Keep in mind AI will eventually use notecard to organize data. |
| Feb 28 |
| Mar 7 | Write AI.h and .cpp  Update Game.h .cpp and main.cpp | On it’s Turn, The AI will move randomly, guess when it can and learn absolutly nothing. |
| Mar 14 (spring break) | Add to the AI class  Update Game.h .cpp and main.cpp | AI Moves Intelligently. List all the locations the AI can be at in [roll die] moves. Use MaxMax (assume a roll of 7 when looking ahead) |
| Mar 21 |
| Mar 28 | Add to AI class  Update Game.h .cpp and main.cpp | Easy AI works. AI Keeps track of all the cards it’s shown and If no one answers one of his guesses, He makes conclusions accordingly. AIs will never make a guess completely out of cards they know about and especially avoid cards owned by the next player. |
| Apr 4 | Study and build The Code required to run the dpll algorithm. | Keep in Mind, the AI will make calls to it. If time allows, write physics. |
| Apr 11 |
| Apr 18 | Finish writing physics and Add the required calls and functionality to the AI class. | No changes should be made to main or game class but check to make sure. The Game should, theoretically, be fully functional. |
| Apr 25 | Finish any last details | Play the game a couple times and see if there are any small things that need to be added. |