Johns Hopkins University

Software Requirement Specifications

Professor Plum's Programmers

Foundations of Software Engineering
Section 81
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Project Summary

The Clueless project is an online version of the classic game of clue with some simplified rules. This game is an investigation game where the players must determine who, how, and where the murder occured, but each player has different clues. Through interaction and gameplay, players will gain more knowledge and try to be the first one to make a correct accusation. This project is to make this available to many people without the requirement of any physical components.

Software Architecture

Game Server

A Node Express server that manages current game state, broadcast game information and messages, and validates player actions. This server will be hosted on Heroku *(subject to change)*.

Player Client

A python client with a graphical user interface (GUI). This GUI will allow the player to play the game and communicate with other players in a simple fashion through communication with the current game server.

Use Cases

Player Sign-In	
Number	FREQ-01
Goal	Player joins into game of Clue-less
Trigger	Local App start-up
Actors	Player, Game Host
Pre-Conditions	None
Post-Conditions	Player is connected to a game instance of Clue-less
Assumptions	Player has required software and dependencies installed
Related Use Cases	FREQ-02, FREQ-03
Created By	Nathan
Last Updated	16 March 2021

Main Success Scenario	
Actor Action	**System Response**
1. *Player starts Clue-less software*	2. *Local App starts up*
	3. *Menu shown to Join Game or Start New Game*
4. *Player selects Join Game (for New Game, goto FREQ-04)*	5. *System Prompts user for required game information (Username, host location)*
6. *Player Selects New Game (goto FREQ-04)*	
7. *Player Provides Required information*	8. *System finds specified game information*
	9. *Enters join game Scenario (FREQ-02)*
Alternate Scenarios	
Game already in progress (enter from line 4):	
	7. *System finds Player current game*

	information
	8. *Returns Player to current point in game*
Cannot find specified Game (enter from line 4):	
	9. *System searches for specified host, and cannot find game*
	10. *Provide an error message, and ask Player to recheck information (return to step 3.)*
Specified Game is full (enter from line 4):	
	11. *Game app finds specified game*
	12. *Player username is not present in current player information, and all player slots are filled (BR_1)*
	13. *Return message explaining that game is full*
Username present in game (enter from line 11):	
	14. *Provides an error message, telling the user to pick a different username.*

User Joins Game

Number	FREQ-02
Goal	Game is set up, and ready to begin player turns.
Trigger	User connects to new game
Actors	Player, Game Host
Pre-Conditions	Player joins game instance
Post-Conditions	Game is ready for turns to begin
Assumptions	None
Related Use Cases	FREQ-01, FREQ-03
Created By	Nathan
Last Updated	15 March 2021

Main Success Scenario	
Actor Action	**System Response**
	1. Welcome screen shown
	2. Check to see which player characters have been chosen (BR_2)
	3. Available Characters shown to Player
4. Player Selects Character from provided list	5. Game verifies that selected character remains available
	6. Connects Player to server as the selected character
	7. Show Player success message, showing their Character selection
	8. Wait for game to start (goto FREQ-04 and/or FREQ-05)
Alternate Scenarios	
Character Already Chosen (enter from line 5):	
	8. Character has been selected while Player was viewing options
	9. Show message to Player stating that Character has been selected
	10. Update available Characters for selection, and return to step 3.

Create New Game

Number	FREQ-03
Goal	Create new game instance for Players to join
Trigger	User selects New Game setup
Actors	Game Host
Pre-Conditions	None
Post-Conditions	Game instance created ready for Players
Assumptions	Player has required software and dependencies installed
Related Use Cases	FREQ-01
Created By	Nathan
Last Updated	15 March 2021

Main Success Scenario

Actor Action	System Response
1. Game Host starts game	*2. Welcome screen shown*
	3. Menu shown to Join Game or Start New Game
4. Game Host selects Start New Game	*5. Request Player Username*
6. Game Host provides Username	*7. Game Host signed in as player (goto FREQ-02)*
	8. Check to see current registered Players
	9. Show current number of joined players
	10. If two or more Players joined (including Game Host), provide Start Game button (BR_1)
	11. While waiting for Start Game, update current number of joined players
12. Player selects Start Game	*13. Shuffle cards for all Characters, Weapons, and Rooms*

	14. Select 1 Character, 1 Room, and 1 Weapon to be the Game Anwer
	15. Assign remaining Cards to Players in rotation of the order in which they joined, starting with the Second Player to Join (non-Game Host)
	16. Alert Players that game is beginning, and Display their cards
	17. Goto Player Turn, Host will go first
Alternate Scenarios	
Not Enough Players (enter from line 9):	
	14. While Game Host is only connected Player, disable Start Game button
	15. Show message instructing Host to invite Players
	16. When second Player joins, return to step 10

Player Turn

Number	FREQ-04
Goal	Player Selects turn Action
Trigger	Player is up in the current turn rotation
Actors	Players
Pre-Conditions	Game Started
Post-Conditions	Player Selected Turn Action
Assumptions	None
Related Use Cases	FREQ-03
Created By	Nathan
Last Updated	16 March 2021

Main Success Scenario	
Actor Action	**System Response**
	1. *Game notifies current Player that their turn is up*
2. *Player acknowledges turn notification*	3. *Game shows Player possible turn options*
4. *Player chooses to move into Hallway (BR_9)*	5. *Verify Hallway is unoccupied*
	6. *Update Player position*
	7. *Alert other players that turn is complete*
	8. *Move to next Player turn (step 1 for new player)*
Alternate Scenarios	
Alternative Options (enter from line 3):	

17. *Other Possible Turn Options:*
   a. *Move from Hallway to Room (BR_6): Goto FREQ-05*
   b. *Move from Room through Secret Passage (BR_7): Goto FREQ-05*
   c. *Remain in Room, Make Suggestion (BR_8): Goto FREQ-06*
   d. *Make an accusation: Goto FREQ-07*	

All adjacent Hallways are occupied (BR_10) (enter from line 3):	
	18. *Verify Player was not moved into room by other player and no shortcut is available*
	19. *Alert Player their turn was skipped and why*
	20. *Alert all Players that turn is complete*
	21. *Move to next player turn (step 1 for new player)*

Move into Room

Number	FREQ-05
Goal	Player Moves to new location and completes turn
Trigger	Player selects to move into room
Actors	Player
Pre-Conditions	Player is in Hallway
Post-Conditions	Player Has made Accusation
Assumptions	None
Related Use Cases	FREQ-03
Created By	Nathan
Last Updated	16 March 2021

Main Success Scenario	
Actor Action	**System Response**
1. Player selects which room they want to enter	2. System verifies that Player is in a Hallway adjacent to the selected Room
	3. System updates Player position and update position in GUI
	4. Alert other players of move
	5. Prompt player to make a Suggestion Goto FREQ-06

Suggestions

Number	FREQ-06
Goal	Player receives response to Suggestion and turn ends
Trigger	Player picks Character, Weapon, and Room to suggest
Actors	All Players
Pre-Conditions	None
Post-Conditions	None
Assumptions	None
Related Use Cases	FREQ-04
Created By	Nathan
Last Updated	15 March 2021

Main Success Scenario	
Actor Action	**System Response**
1. *Current Player selects 1 Character, 1 Weapon (BR-4), and 1 Room to Suggest*	2. *System validates that the player is in the selected room.*
	3. *System alerts Next Player in rotation that they must respond to suggestion*
	4. *Show Next Player the Character, Weapon, and Room that was suggested*
	5. *Request a Card to show Current Player*
6. *Next Player chooses card to show Current Player*	7. *Verify that chosen card is either a Character, Room, or Weapon that Current Player suggested*
	8. *Alert Current Player that their Suggestion was answered*
	9. *Show Current Player the response Card*
	10. *Move to Next Player turn*

Alternate Scenarios	
Next Player does not have any of Suggestion Cards (enter from line 3):	
	10. Alert Next Player that they do not have any of the Suggestion cards
	11. If the Player after "Next Player" is not Current Player, return to step 2 with Player 3 as Next Player
	12. If no further Players remain in the circulation, alert Current Player that no cards were returned
	11. Move to Next Player turn

Accusations	
Number	FREQ-07
Goal	Player Makes accusation and Wins or is Removed
Trigger	Player chooses to make an Accusation on their turn
Actors	Player
Pre-Conditions	None
Post-Conditions	Either: Game is complete, or Player is removed from Game
Assumptions	None
Related Use Cases	None
Created By	Nathan
Last Updated	16 March 2021

Main Success Scenario	
Actor Action	**System Response**
1. Current Player selects 1 Character, 1 Weapon (BR-4), and 1 Room to Accuse	2. System alerts other Players that an accusation is being made
	3. Alert other Players of the Character, Weapon, and Room that are being accused
	4. Compare Accusation to the Game Answer
	5. If Character, Weapon, and Room match, Alert Player that they have Won
	6. Alert All other players that the Current Player won
	7. Show players the Game Answer
	8. Game is Complete
Alternate Scenarios	
Accusation does not match Game Answer (enter from line 4):	
	13. Alert Player that their answer is wrong, and that they have lost
	14. Alert Player that they can no longer take actions, but must respond to Suggestions
	15. Remove Player from Turn rotation, but not Suggestion rotation
No Players Remain (enter from line 15):	
	16. Alert all Players that the Game is over
	17. Show players the Answer
	18. Game is Complete

End of Game

Number	FREQ-08
Goal	Present users with a way to start a new game if they want to keep playing.
Trigger	Game resolution (via Accusations FREQ-07)
Actors	Game Host, Players
Pre-Conditions	Game is finished.
Post-Conditions	New game or players disconnect
Assumptions	Players might want to play more than one game of clue in one gaming session.
Related Use Cases	FREQ-02, FREQ-03
Created By	Don Sisco
Last Updated	16 March 2021

Main Success Scenario	
Actor Action	**System Response**
	1. Prompts the players to play again
2. Selects play again	3. Player joins/creates the game lobby, the first player to select will become the game host
Alternate Scenarios	
Player selects to leave the game (enter from line 1):	
	4. Player disconnects

Business Rules

Rules	
Number	**Description**
BR_1	The Clue-less game will have 2 to 6 players
BR_2	Each player will select a unique character from one of the six playable suspects available in the original Clue game
BR_3	Nine possible Rooms
BR_4	Six possible weapons
BR_5	Usernames within a game must be unique and at least 2 characters long.
BR_6	If the player is in a hallway, they must move into one of the two accessible rooms and make a suggestion
BR_7	If the player is in a corner room, they may take a secret passage to the opposite corner and make a suggestion
BR_8	If the player was forced into a room by another player suggestion, they may remain and make a suggestion
BR_9	If the player is in a room, they may move into one of the connected hallways if a player is not currently in that hallway
BR_10	Each player has a designated fixed starting location based on the suspect chosen.
BR_11	A player can make at most one suggestion per turn
BR_12	A player can make at most one accusation a game and only during their turn.

Actors

Actors	
Name	**Definition**
Game Host	The initial Player to start a game, responsible for game invitations and selecting when to start game
Player	Any one of the 2-6 participants in a given game instance of Clue-less

Appendix A: Additional Functional Requirements

The following requirements, while defining system functions, do not fit cleanly into the Use Case format.

Requirement Number	Description
FREQ-09	The System shall display the character positions, weapons, and map to the Player
FREQ-10	The System shall update Player positions whenever they are changed by movement or suggestions
FREQ-11	The System shall handle rule checks on the server side to avoid cheating by players
FREQ-12	The System shall handle players closing and reopening local game connections, restoring their current game information

Appendix B: Non-Functional Requirements

Requirement Number	Description
NFREQ-01	Server shall be less than 512 MB RAM - *Heroku Free Tier Limit*
NFREQ-02	Player Client shall be able to run on Windows 10
NFREQ-03	System will run tests on push to code repository
NFREQ-04	System shall be 2 to 6 players per game.
NFREQ-05	The GUI shall effectively communicate to the player what actions they must take to play the game
NFREQ-06	The GUI shall allow players to join and play games quickly and efficiently
NFREQ-07	The Local System shall be easy to learn, requiring only simple documentation for Players to get the game running
NFREQ-08	The GUI should be useful to the players, conveying all the information they need to know the current game status and their required/allowed actions

Appendix C: User Experience Goals

Goal Number	Description
UEG-01	Fun: user has fun playing Clue-less
UEG-02	Entertaining: playing the game is a source of entertainment
UEG-03	Supportive of creativity: user feels like he/she has truly played a game, not just responded to system prompts
UEG-04	Emotionally fulfilling: user loves playing the game so much he/she voluntarily shares it with others