CPSC 224 Final Project

PROJECT PLAN
04/01/2024

Code Climbers

Triple Threat

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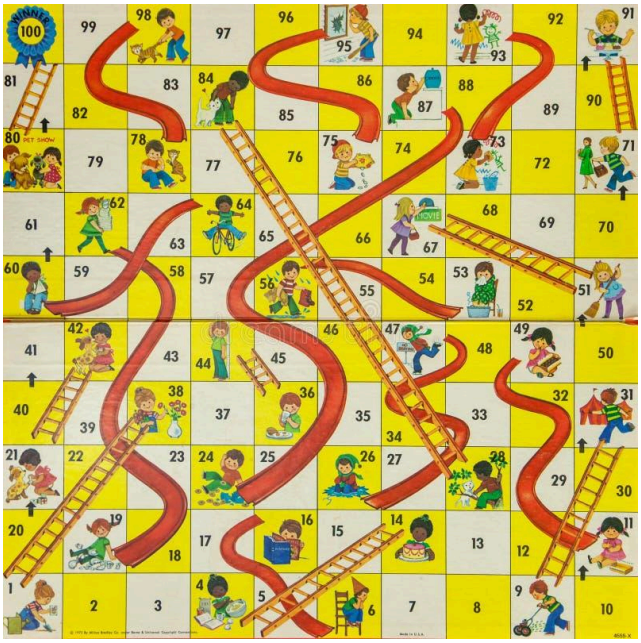
1 Project Overview

We will be creating a version of the classic game “Chutes and Ladders”. In this game, players roll dice to move their piece through the board. Certain tiles contain chutes or ladders, which move the player backwards and forwards respectively. The game is won when one player makes it to the last tile on the board. One full playthrough of the game lasts roughly 30 minutes and must be played with at least two players. The game relies heavily on luck due to the predetermined path the player must take and the randomness of the die. A full game of Chutes and Ladders consists of the participating players taking turns rolling the dice to advance to the finish.



2 Project Requirements

Table 1: Major Features

Feature	*Description*
Board Generation	Implement the game board with chutes and ladders.
Player Movement	Enable player movement based on spinner/die outcomes.
Win Condition	Determine and announce the winner when a player reaches the final square.
UI/UX Design	Create an intuitive user interface for gameplay.
Multiplayer Support	Allow 2-4 players to join a game session.

Board Generation	
Priority	**High**
Purpose	Create a board that can be used to track the position of player pieces, chutes, and ladders
Inputs / Needs	N/A
Operators / Actors	Game Board, Tiles
Outputs	Board is created as an array that can hold game values

Player Movement	
Priority	**High**
Purpose	Allow players to move their piece along the board using dice rolls.
Inputs / Needs	User input from rolling dice
Operators / Actors	Dice, Player
Outputs	Players can move pieces on the board according to their dice roll

Win Condition Tracking	
Priority	**Low**
Purpose	Keep track of the win condition, and when the condition is met, declare/select a winner.
Inputs / Needs	Score from both players to track
Operators / Actors	Score, Player
Outputs	N/A

UI UX Design (Main Board)	
Priority	**High**
Purpose	Create a window where players can view the game and its parts (board, players, dice, score, etc.)
Inputs / Needs	N/A
Operators / Actors	View, Players
Outputs	Viewable information about the game via a UI

UI UX Design (Loading Screen)	
Priority	**Low**
Purpose	Create a window where players can select the number of players in the game
Inputs / Needs	N/A
Operators / Actors	View, Players
Outputs	Start-up screen where player count can be selected

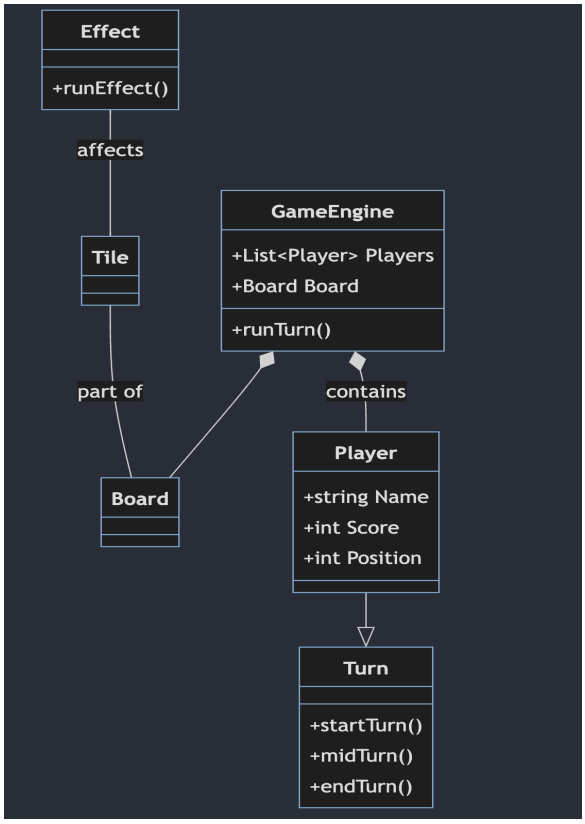
Multiplayer Support	
Priority	**Medium**
Purpose	Allow multiple players to play the game simultaneously.
Inputs / Needs	Second player join
Operators / Actors	Player Objects, Players
Outputs	Multiple players can now play together

3 UML Diagrams

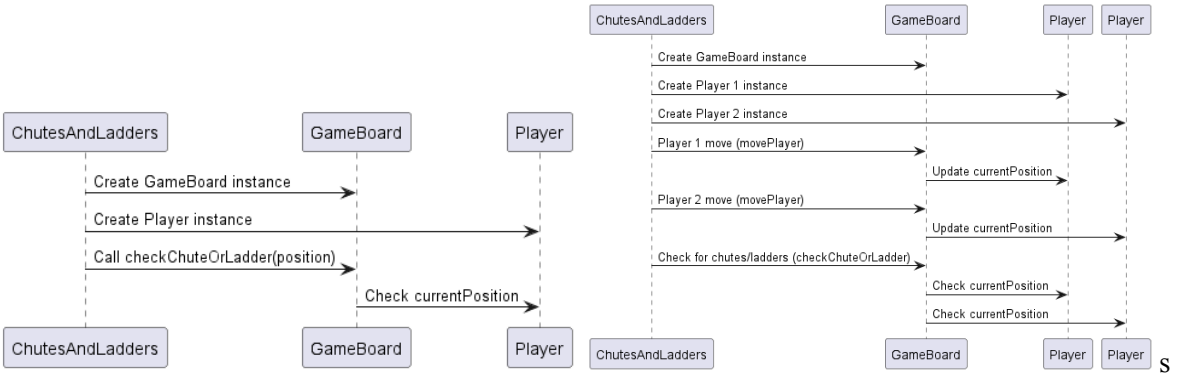
The general design of the program centers around one “Game Engine” object which keeps track of the players and board during the game. Once the game begins, the engine creates a “Turn” object to encapsulate the operations involved in executing a turn. The turn object handles the logic allowing the

player to roll dice and move their piece and is then destroyed at the end of the turn. The board that the player moves around in is an array with length equal to the number of tiles, which themselves are separate objects that store and handle information regarding the effects to be activated should a player land on them.

3.1 UML Class Diagram



3.2 UML Sequence Diagram



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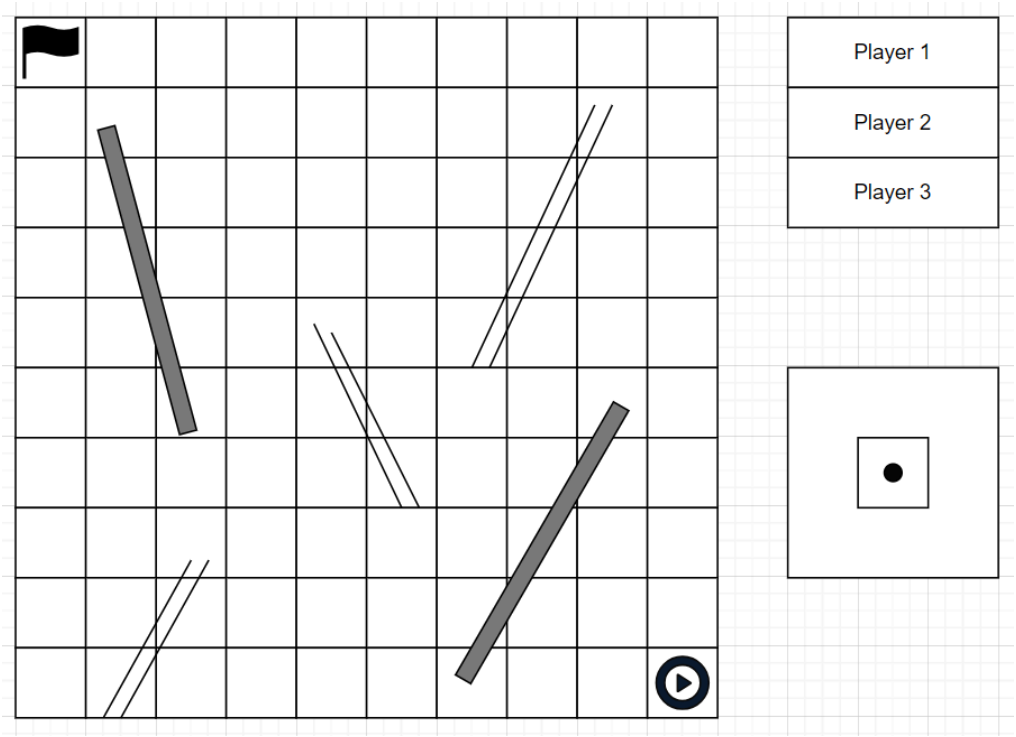
4 Project User Interface Design

The UI design is simple and easy to understand at a glance. The first and most important component, the board, allows for users to see the state of the game as well as where players and obstacles lie. The board is a static element in that it does not change throughout the game, only the pieces on it change. The player scorecard displays the name and score (board position) so it can be read by all players. It also telegraphs information like which players turn it is. The final aspect of the design is a small “tray” to throw dice in.



5 Project Schedule

The project has several key milestones that outline the progression and completion of various stages. First, by April 3rd, the project plan must be finalized, establishing all the necessary deadlines. Following this, the first prototype of the game should be operational with a basic user interface by April 10th. Subsequently, by April 17th, the second prototype aims to incorporate a graphical user interface, enhancing the user experience. The pivotal "Code Complete" milestone is targeted for April 25th, by which all essential features must be implemented and rigorously tested to ensure functionality and stability. This leads to the presentation, slated for completion by April 29th, where the team will showcase the project's progress and achievements. Finally, the project culminates with the completion of the final report by May 9th, encapsulating the entirety of the project's development, challenges, and outcomes.

Table 3: Major Scheduling Milestones

Milestone	*Description*	*Target Completion Date*	*Team Member Responsible*	*Time Estimate (Hours)*
Project Plan	Project plan completed, deadlines set.	April 3rd	All	4
First Prototype	Game is running with a basic UI	April 10th	All	N/A
Player Logic	Player can be created, roll die, and name itself	April 10th	Will	2

Tile Logic	Tiles properly initialize as blanks, chutes, or ladders	April 10th	Steve	3
Board Logic	Board is created with proper length and tile connections	April 10th	Will	2.5
Basic UI	Game now creates UI when run	April 10th	Manny	4
Second Prototype	Game is running with a GUI	April 17th	All	N/A
Start Screen	Game adds start screen to select player num	April 17th	Manny	2
Multiplayer	Logic added to support multiple players	April 17th	Steve	2
Code Complete	All required features completed and tested	April 25th	All	N/A
Presentation	Presentation complete	April 29th	All	N/A
Final Report	Final Report complete	May 9th	All	N/A

Appendix

Provide additional supplemental information in an appendix as necessary.