SNAKE AND LADDER

Team members:

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Project Overview:

We are implementing a two-person version of traditional Snake and Ladders board game as our project. Two players move their game pieces along the 10x10 board by rolling a dice in this game. Reaching square 100 by itself identifies as the winning condition for the game.

A pre-placed series of snakes and ladders occupies the positions on the game board. Players achieve a lucky shortcut by landing on a ladder's bottom section since it allows them to ascend toward the higher square at the ladder's tip. When a player lands on a snake's head position they must move directly down to the square where the snake's tail resides which results in movement toward the back of the race.

For winning the game players need to exactly land on square 100. The player must wait until their next turn to try again when their dice roll would put them beyond square one hundred. The gameplay tension rises when players approach the end since this rule influences their strategic choices.

Inside our game we have built two play modes with friendly competition between people and one-on-one battles between players and the computer system. Users can enjoy the game through its easy-to-use interface that both shows dice rolls visually and piece movements and uses sound effects for excitement and allows them to choose between light and dark themes. Users have an option to safeguard their game development so they can return later to continue playing.

The basic features that we are working on this project:

- A visually appealing game board with snakes and ladders.

- Multiple player options (human vs. human, human vs. computer).

- Customizable board configurations (Screen Mode - Light/Dark).

- Sound effects and visual animations.

Functional Requirements:

FR1: At the start of the game, players can select between two game modes:

- Human vs. Human

- Human vs. Computer

FR2: The game board consists of 100 squares arranged in a 10x10 grid with numbered positions from 1 to 100.

FR3: Each player's piece is placed at position 1 at the beginning of the game.

FR4: Players take turns rolling a single six-sided dice.

FR5: After rolling the dice, the player's piece moves forward by the number of squares shown on the dice.

FR6: If a player's piece lands on a square containing the head of a snake, the piece moves down to the square containing the tail of that snake.

FR7: If a player's piece lands on a square containing the bottom of a ladder, the piece climbs up to the square containing the top of that ladder.

FR8: If a player's piece would move beyond position 100 based on the dice roll, the player's piece does not move and the turn passes to the next player.

**FR9:** A player must land exactly on position 100 to win the game.

FR10: When a player wins, the game displays a victory message and offers options to play again or return to the main menu.

FR11: In Human vs. Computer mode, the computer automatically rolls the dice and moves after the human player completes their turn.

FR12: The game board will include at least 8 snakes and 8 ladders in fixed positions.

FR13: The game will keep track of each player's position and display it on the screen.

User Interface Prototype:
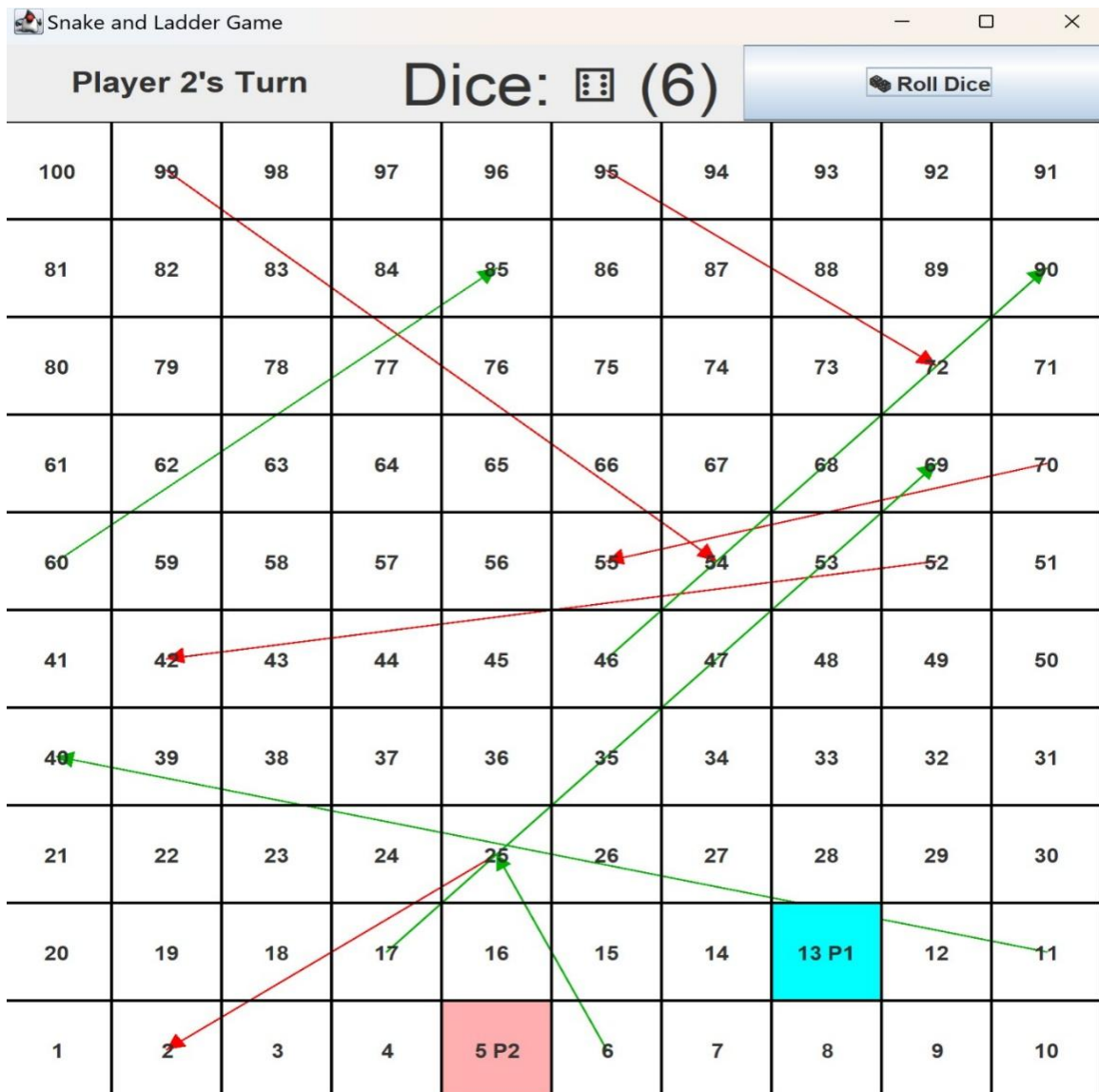
User Interface Requirements:

UIR1: The main menu displays options for game modes (Human vs. Human or Human vs. Computer), settings, and exit.

UIR2: The game board is displayed as a 10x10 grid with numbered squares from 1 to 100, with snakes and ladders illustrated visually as lines.

UIR3: Each player's piece is displayed with a distinct color.

UIR4: The current player's turn is clearly indicated on the screen.

UIR5: A "Roll Dice" button is provided for the human player to roll the dice.

UIR6: The dice roll result is displayed both numerically and graphically.

UIR7: When a player's piece moves, the progression of the piece across the board is shown.

UIR8: When a player lands on a snake or ladder, a special animation and sound effect plays.

UIR9: The game provides a settings menu where players can toggle between light and dark modes.

UIR10: Sound effects can be toggled on/off in the settings menu.

UIR11: The game displays a history of dice rolls and movements for both players.

UIR12: A "New Game" button allows players to start a new game at any time.

UIR13: A "Quit Game" button allows players to exit to the main menu.

Project Plan:

Requirement	Deliverable 1	Deliverable 2	Deliverable 3
FR1			X
FR2	X		
FR3	X		
FR4	X		
FR5	X		
FR6		X	
FR7		X	
FR8		X	
FR9		X	
FR10			X
FR11			X
FR12			X
FR13			X
UIR1			X
UIR2	X		
UIR3	X		
UIR4	X		
UIR5	X		
UIR6	X		
UIR7	X		
UIR8		X	
UIR9		X	
UIR10		X	
UIR11			X
UIR12			X
UIR13			X

UML Diagram:

The below preliminary UML class diagram outlines the main classes and their relationships for the Snake and Ladders game.