COMP2911 Project: Preliminary Design

Stephen Sherratt, Matthew Todd, Rebecca Wiley

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1   Valid moves in Quoridor

Players take turns to move in Quoridor. A move is only valid if it occurs on a player's turn. There are two distinct types of move in Quoridor:

- Moving a piece
- Placing a wall

Players must make exactly one move each turn.

1.1   Moving a Piece

A piece may move onto a square directly adjacent to its current square forwards, backwards, left or right unless:

- there is a wall separating the piece's current square from its desired square.
- there is no square in the desired direction of travel (ie. the piece is at the edge of the board).

Additionally, if a player's piece is adjacent to their opponent's piece, they may move their piece to any square adjacent to the opponent's piece provided that it satisfies the two conditions above.

1.2   Placing a Wall

A wall may be placed in the gaps between squares such that:

- there are two squares on both sides of the wall (ie. it is not on the edge of the board or crossing the edge of the board).
- it does not intersect with any walls already placed.
- after placing the wall there is at least one path from each player to a square on their respective opposite side of the board.

2 Candidate Classes

- Manager

- Game

- Move
    - MovePiece
    - PlaceWall

- Board

- Player

- Piece

- Wall

- Square

- Gap

3   Class Responsibilities

Manager

Responsibilities

- Load Games
- Save Games
- Create Playels
- Start New Game

Collaborators

- Game
- Player

Game

Responsibilities

- Parsing input for moves
- Checking validity of moves
- Making moves
- Undoing and redoing moves
- Determining when a game is over

Collaborators

- Manager
- Piece
- Wall
- Player
- Move
- Board

Move

Responsibilities

- Describing what type of move is being made
- Validating moves
- Making the changes to the state of the board

Collaborators

- Piece
- Wall
- Player
- Board
- MovePiece
- PlaceWall

MovePiece

Responsibilities

- Describing the movement of a player's piece
- Validating movement of a piece
- Updating a piece's position

Collaborators

- Piece
- Player
- Board
- Move

PlaceWall

Responsibilities

- Describing the placement of a wall
- Validating placement of a wall
- Adding a wall

Collaborators

- Wall
- Player
- Board
- Move

Board

Responsibilities

- Keeping track of wall locations
- Checking for paths players can take
- Formatting output so board can be displayed

Collaborators

- Wall
- Piece
- Square
- Gap

Player

Responsibilities

- Keep track of how many walls a player has left
- Store the player's name
- Keep track of the player's piece

Collaborators

- Piece

Piece

Responsibilities

- Keep track of a piece's position
- Move a piece

Collaborators

- Square

Wall

Responsibilities

- Keep track of wall's position
- Be created in desired position

Collaborators

- Gap

Square

Responsibilities

- Have coordinates

Collaborators

Gap

Responsibilities

- Have coordinates
- Keep track of whether or not there is a wall in the gap
- Know which wall is in the gap (if any)

Collaborators

- Wall