

COMP 6710 Assignment 2

Railroad ink: deep blue edition

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Summary

This project is an implementation of a game called Railroad ink: deep blue edition in Java, using JavaFX. It can be divided into three sections.

1. Game rule implementation

This part includes a set of methods that check the validation of each round's tile placements, predict possible movements, generate dice roll for each round and calculate the basic and bonus score etc. Multiple classes, Enum types are defined as models.

2. Graphical User Interface

Use javaFX to demonstrate the board and tiles, take the player's placement as input. The player is allowed to drag and rotate the tiles.

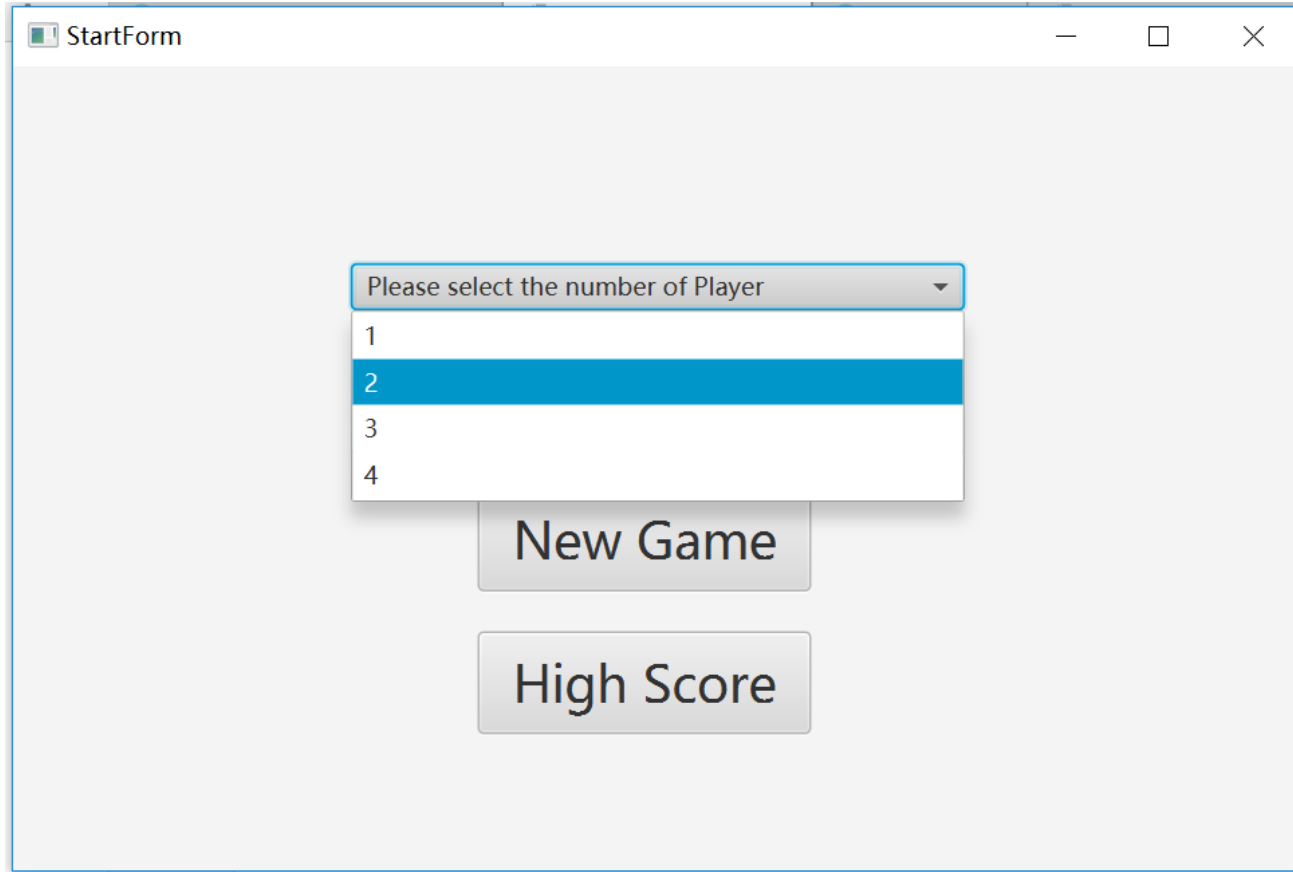
But the tile would snap to home if it's an illegal placement.

This section also has a welcome stage that ask user to choose the number of players(1~4), and set name and type (Human/AI)(if the player is AI, the user also need select the level of difficulty.) for each player, a final stage that showing the scores for each player. There is a stage logs and shows top 5 score in the history.

3. A good computer opponent

Due to the uncertainty of the next dice, the strategy uses the combination of greedy algorithm and depth-first search algorithm. The algorithm also uses the softmax layer commonly used in machine learning to avoid only making a single choice while ensuring that it has possible to access the optimal solution.

Screen shots of our game



Screen shots of our game

OptionForm

Please set the details of player No. 1

Player Name

Player Type ☒ Human ☐ AI

Difficulty

OptionForm

Please set the details of player No. 2

Player Name

Player Type ☐ Human ☒ AI

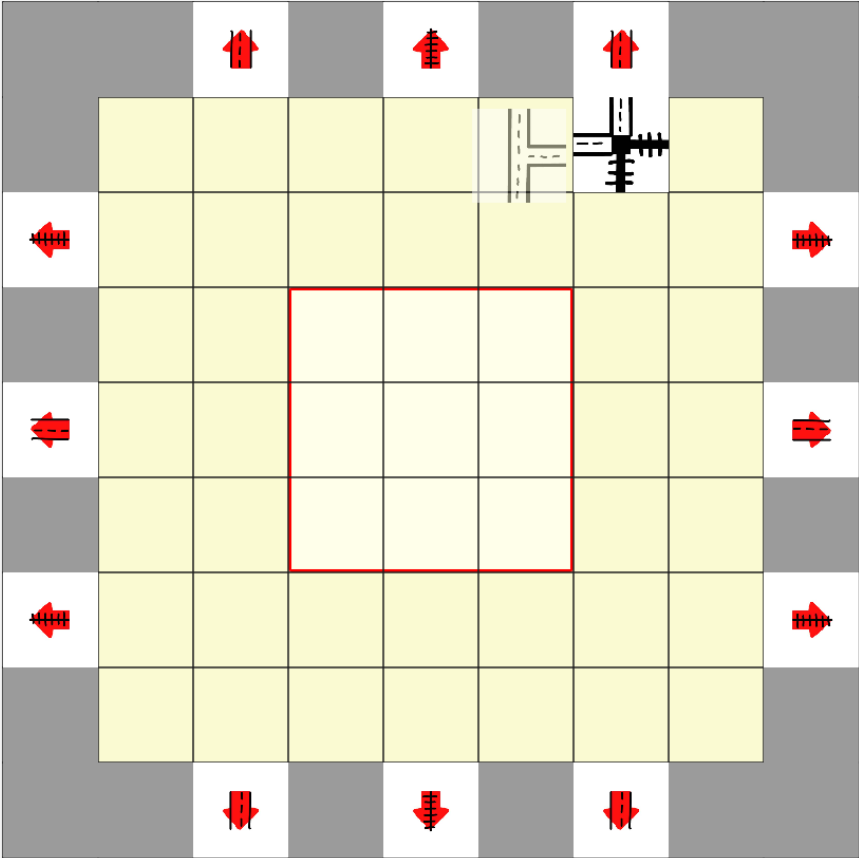
Difficulty

Screen shots of our game

Round: 1

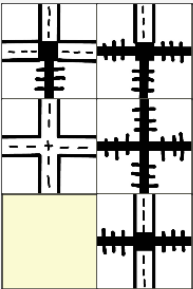
Player 1 Set_Name

Player Type: Human



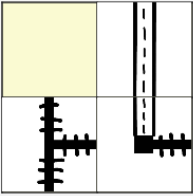
Special Tile

Remaining chance for special tiles: 2



Regular Tile

Remaining tiles that must be placed: 4



Take Back

End Turn

Drag the available tiles to the board, then click End Turn button to end your turn.

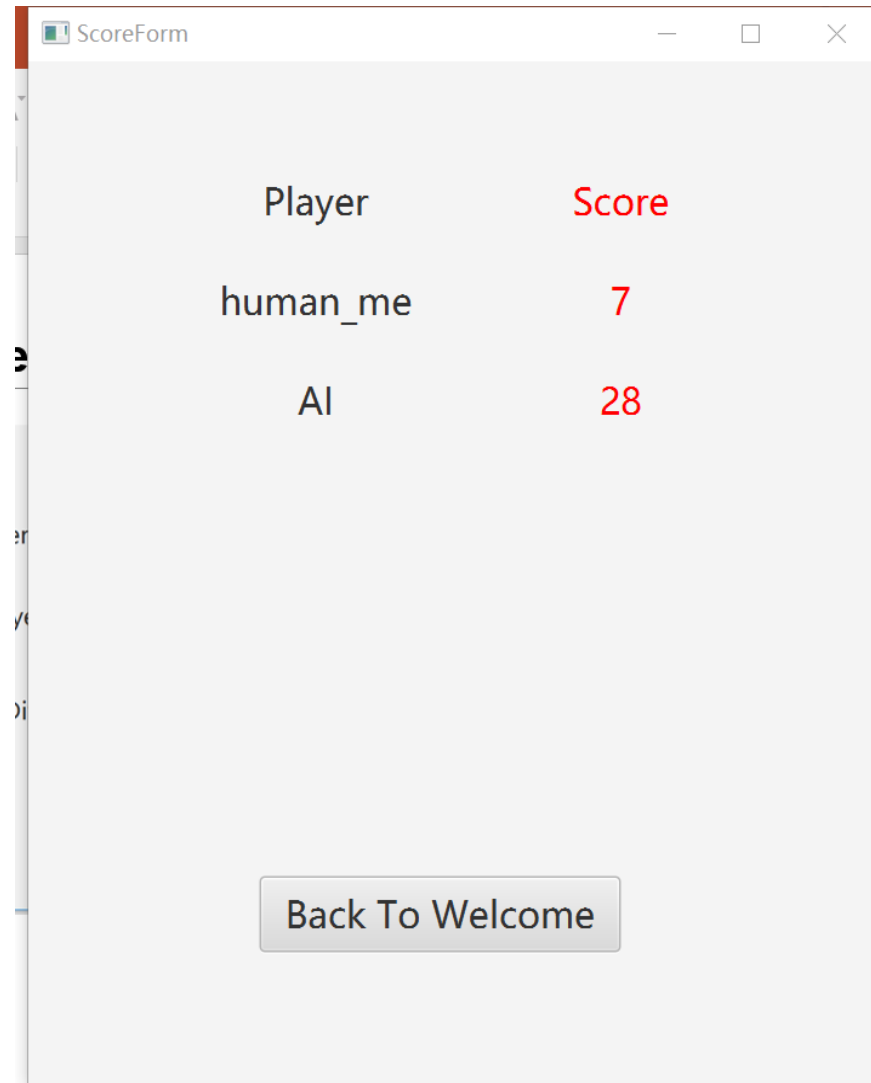
When there's no valid placement can be made, it would be allowed to end the game, otherwise the next turn button can be use only if all 4 regular tiles have been placed.

Take Back Button & Next Turn Button

Warning Message & Tips



Screen shots of our game

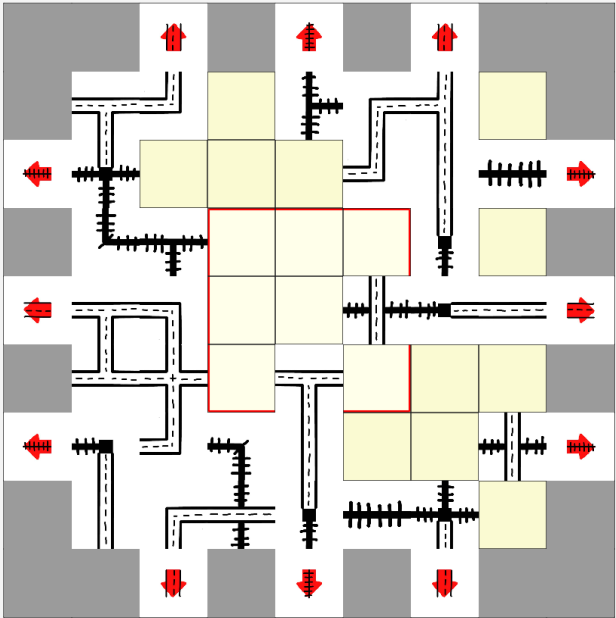


You can even let multiply AI compete with each other

Round: 7

Player 1 EASY

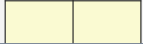
Player Type: AI



Drag the available tiles to the board, then click End Turn button to end your turn.

Special Tile

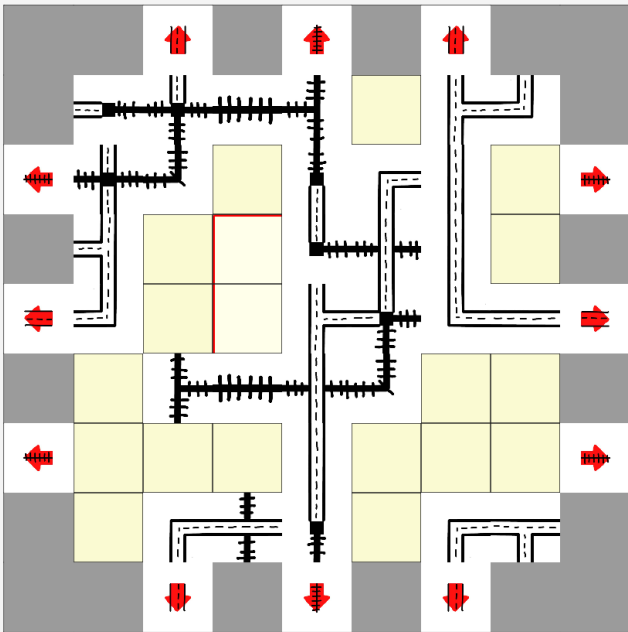
Remaining chance for special tiles: 3



Round: 7

Player 2 HARD

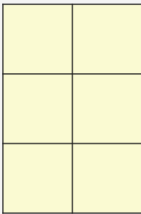
Player Type: AI



Drag the available tiles to the board, then click End Turn button to end your turn.

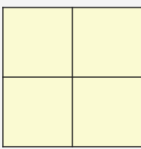
Special Tile

Remaining chance for special tiles: 0



Regular Tile

Remaining tiles that must be placed:



Take Back

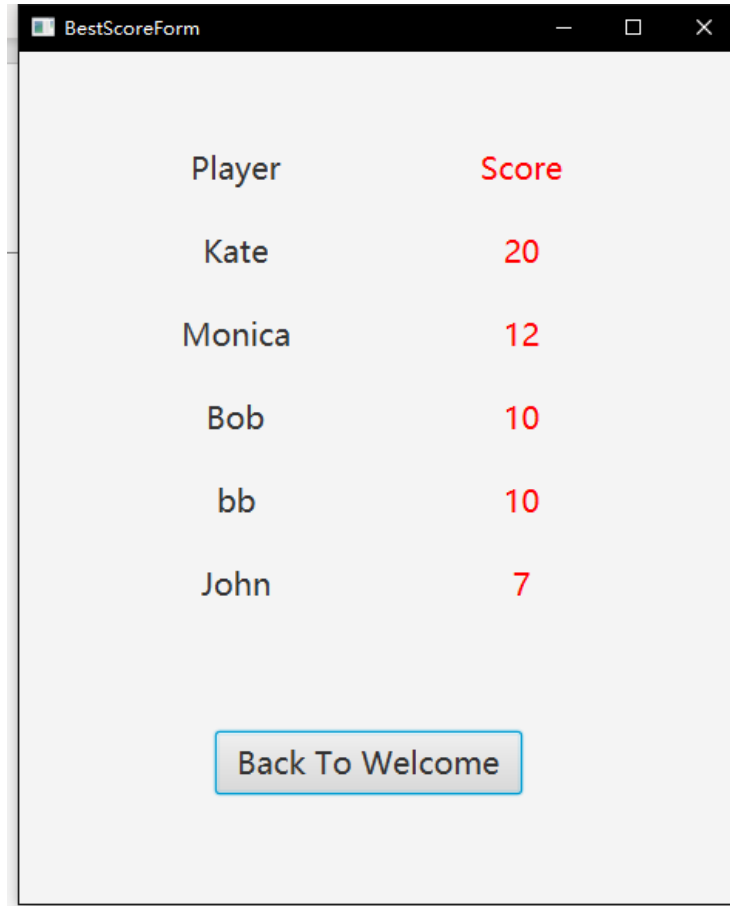
End Turn

ScoreForm

Player	Score
EASY	-5
HARD	35

Back To Welcome

Top 5 in history



A screenshot of a Windows application window titled "BestScoreForm". The window has a standard Windows title bar with minimize, maximize, and close buttons. The main content area is light gray and contains a table with two columns: "Player" and "Score". The "Score" column is highlighted in red. The table lists the top 5 players: Kate (20), Monica (12), Bob (10), bb (10), and John (7). Below the table is a button labeled "Back To Welcome".

Player	Score
Kate	20
Monica	12
Bob	10
bb	10
John	7

Back To Welcome

The background features abstract, organic shapes in shades of pink, light blue, and medium blue. These shapes are layered and overlap, creating a modern, artistic feel. A large white rectangle is centered on the page, serving as a backdrop for the text.

Thank you!