Programming Technology

Documentation of Assignment 3 / Task 4
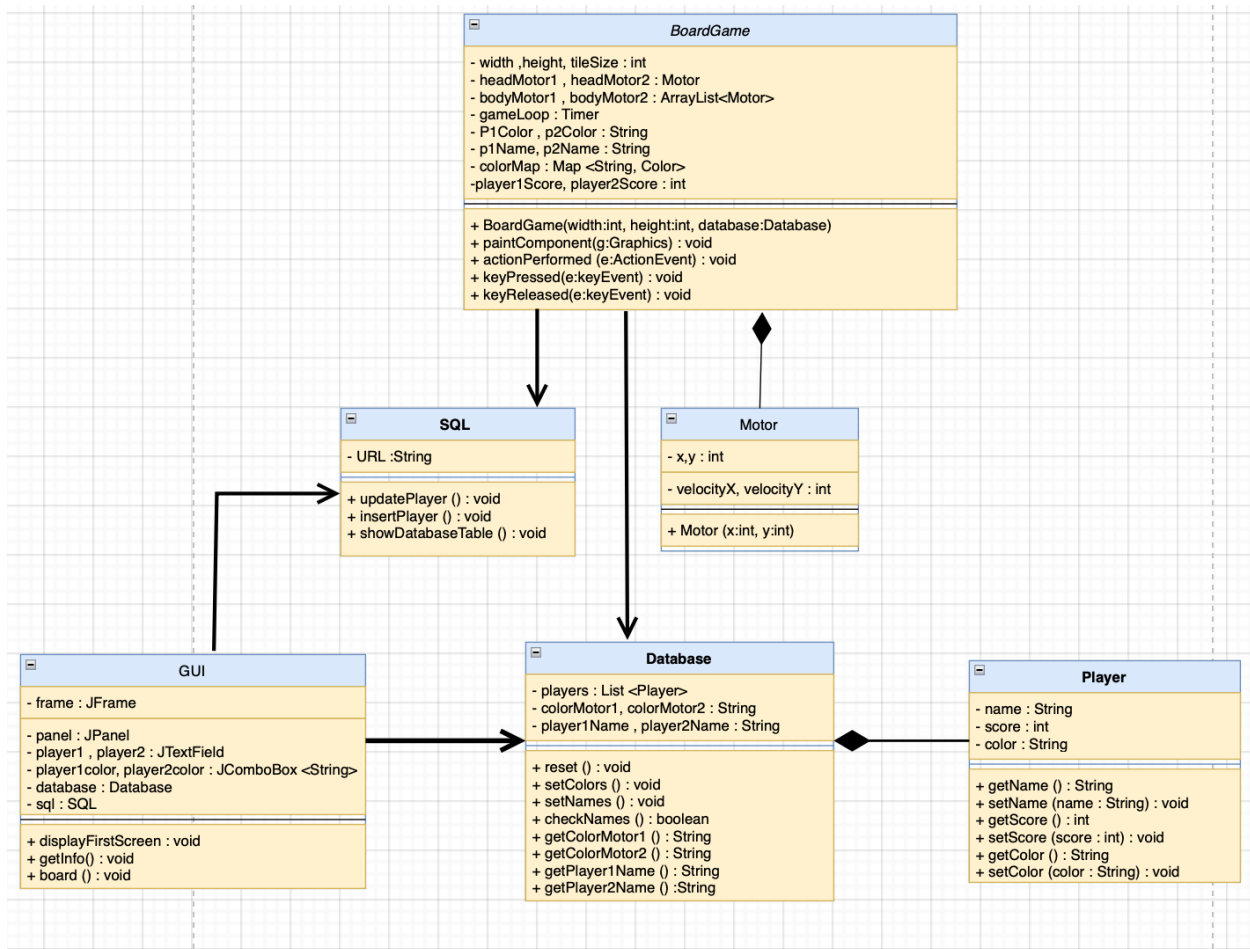
Name: Minoosadat Mousavi

Neptun Code: IBZQ90

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Task Description:

Create a game, with we can play the light-motorcycle battle (known from the Tron movie) in a top view. Two players play against each other with two motors, where each motor leaves a light trace behind of itself on the display. The motor goes in each second toward the direction, that the player has set recently. The first player can use the WASD keyboard buttons, while the second one can use the cursor buttons for steering.

A player loses if its motor goes to the boundary of the game level, or it goes to the light trace of the other player. Ask the name of the players before the game starts, and let them choose the color their light traces. Increase the counter of the winner by one in the database at the end of the game. If the player does not exist in the database yet, then insert a record for him. Create a menu item, which displays a highscore table of the players for the 10 best scores. Also, create a menu item which restarts the game.

UML Class Diagram

BoardGame

- width ,height, tileSize : int
- headMotor1 , headMotor2 : Motor
- bodyMotor1 , bodyMotor2 : ArrayList<Motor>
- gameLoop : Timer
- P1Color , p2Color : String
- p1Name, p2Name : String
- colorMap : Map <String, Color>
- player1Score, player2Score : int

+ BoardGame(width:int, height:int, database:Database)
+ paintComponent(g:Graphics) : void
+ actionPerformed (e:ActionEvent) : void
+ keyPressed(e:keyEvent) : void
+ keyReleased(e:keyEvent) : void

SQL

- URL :String

+ updatePlayer () : void
+ insertPlayer () : void
+ showDatabaseTable () : void

Motor

- x,y : int
- velocityX, velocityY : int

+ Motor (x:int, y:int)

GUI

- frame : JFrame
- panel : JPanel
- player1 , player2 : JTextField
- player1color, player2color : JComboBox <String>
- database : Database
- sql : SQL

+ displayFirstScreen : void
+ getInfo() : void
+ board () : void

Database

- players : List <Player>
- colorMotor1, colorMotor2 : String
- player1Name , player2Name : String

+ reset () : void
+ setColors () : void
+ setNames () : void
+ checkNames () : boolean
+ getColorMotor1 () : String
+ getColorMotor2 () : String
+ getPlayer1Name () : String
+ getPlayer2Name () :String

Player

- name : String
- score : int
- color : String

+ getName () : String
+ setName (name : String) : void
+ getScore () : int
+ setScore (score : int) : void
+ getColor () : String
+ setColor (color : String) : void

Test cases

1) Two players enter unique names and select different colors, then click "Start." The game board launches without errors.

2) One player's motor collides with the other's light trail. The game ends, and the winning player's score increments correctly.

3) Before or after the match, clicking "Show Score" displays a pop-up with up to 10 players ordered by highest score.

4) After "Game Over," clicking "Restart" clears the board and starts a fresh round with the same players, no crash or error.

5) Both players enter the same name; the GUI displays an error dialog and refuses to start until distinct names are provided.