Documentation

21.11.2023 Prog. Tech. Assignment 2
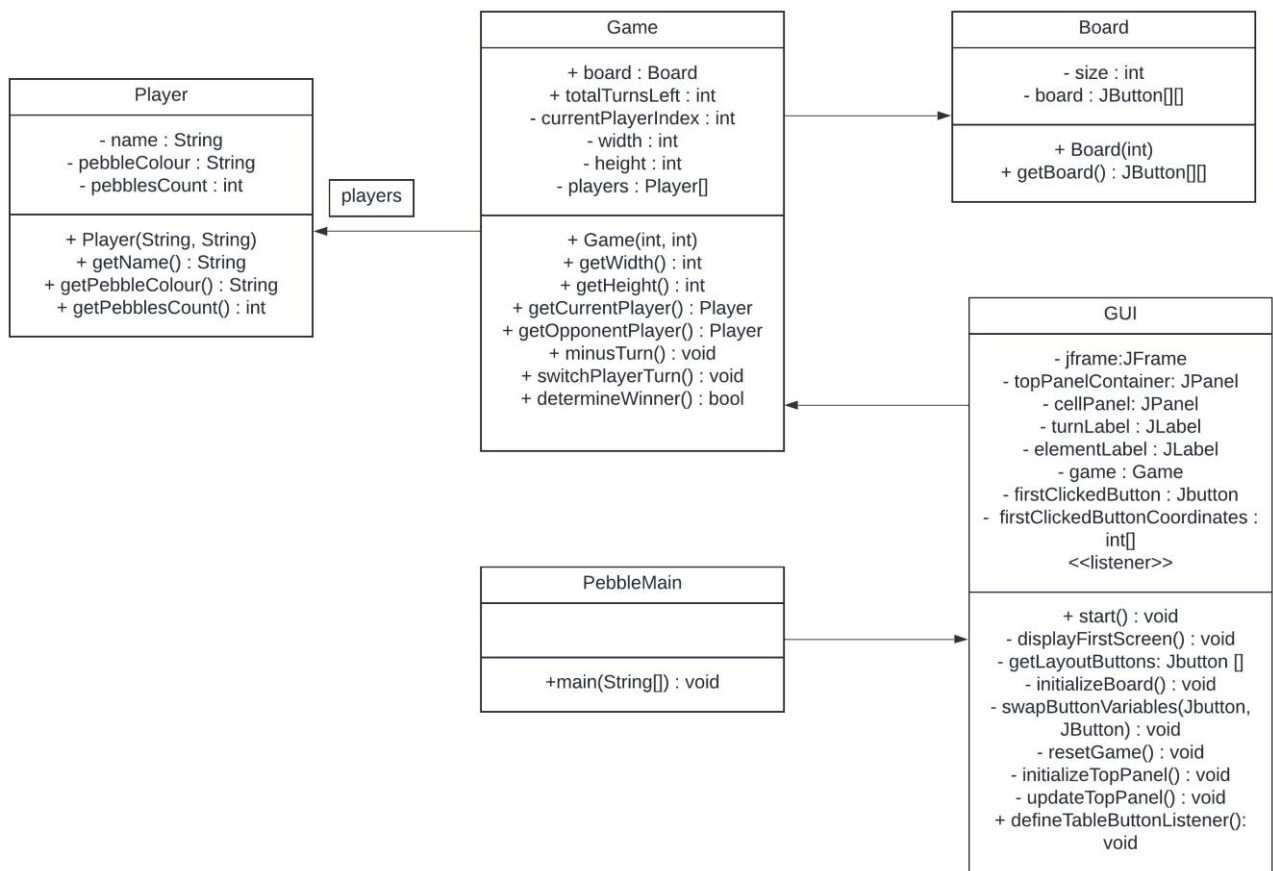Shepelenko Mykhailo DN36E8

Task 2

Pebble is a two-player game, played on a board consists of n x n fields. Initially, n white and n black pebbles are placed on the board randomly. Each color belongs to only one player. The players take turns choosing one of its pebble, and then move it horizontally or vertically. The movement also affects the neighbouring pebbles in the direction (the pebble on the edge falls off). The objective of the game is to push out as much pebbles of the opponent from the board as we can, within a given number of turns (5n). A player wins, if he has more pebbles on the board at the end than his opponent. The game is draw, if they have the same number of pebbles on the board.
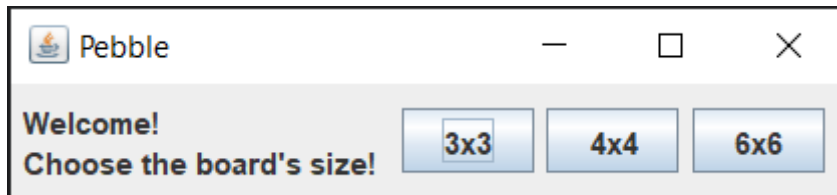
Implement this game, and let the board size be selectable (3x3, 4x4, 6x6 → turns are 15, 20, 30). The game should recognize if it is ended, and it has to show the name of the winner in a message box (if the game is not ended with draw), and automatically begin a new game

Diagram

Player

- name : String
- pebbleColour : String
- pebblesCount : int

+ Player(String, String)
+ getName() : String
+ getPebbleColour() : String
+ getPebblesCount() : int

Game

+ board : Board
+ totalTurnsLeft : int
- currentPlayerIndex : int
- width : int
- height : int
- players : Player[]

+ Game(int, int)
+ getWidth() : int
+ getHeight() : int
+ getCurrentPlayer() : Player
+ getOpponentPlayer() : Player
+ minusTurn() : void
+ switchPlayerTurn() : void
+ determineWinner() : bool

players

Board

- size : int
- board : JButton[][]

+ Board(int)
+ getBoard() : JButton[][]

GUI

- jframe:JFrame
- topPanelContainer: JPanel
- cellPanel: JPanel
- turnLabel : JLabel
- elementLabel : JLabel
- game : Game
- firstClickedButton : Jbutton
- firstClickedButtonCoordinates : int[]
<<listener>>

+ start() : void
- displayFirstScreen() : void
- getLayoutButtons: Jbutton []
- initializeBoard() : void
- swapButtonVariables(Jbutton, JButton) : void
- resetGame() : void
- initializeTopPanel() : void
- updateTopPanel() : void
+ defineTableButtonListener(): void

PebbleMain

+main(String[]) : void

Tests

After running the program user sees this frame:

User can choose the board's size.

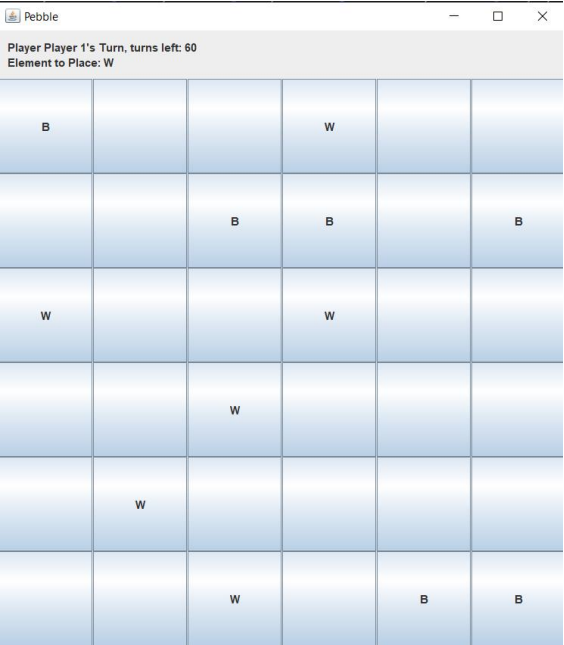Depending on the chosen size, user sees these boards:
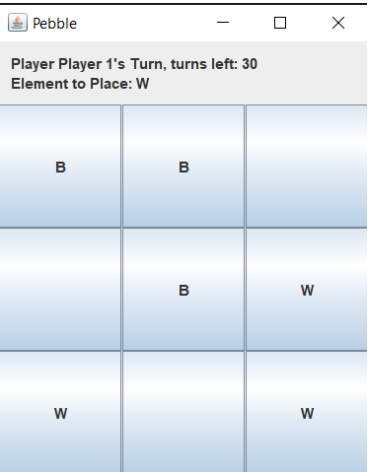
3x3:

4x4:

6x6:

According to the game rules, the pebbles are arranged randomly.

There are a turn's counter and an elements to move and a hint to know whose the turn is on the top panel.
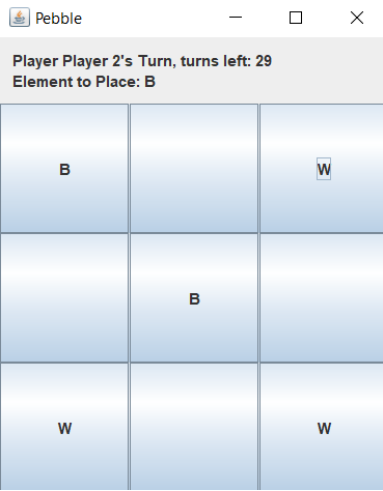
User can make a move according to the rules written in the task by clicking on desired pebble and the adjacent empty cell.

If there are opponent's pebbles on the adjacent cells, they removes.
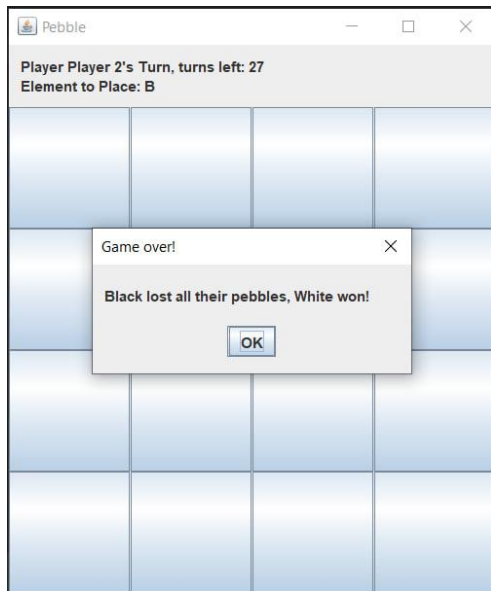
Before the move:

After the move:

The white pebble was moved to the right top corner, the neighboring black cell was removed.
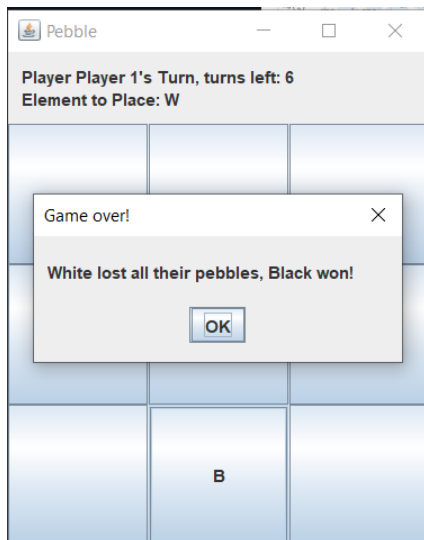
According to the rules game finishes if there are no turns left or there are no pebbles of any player left.

After the game over, a new game automatically starts.

Player having white pebbles won:

Player having black pebbles won:

Draw: