

Algorithm explanations

When the game starts, it plays background music continuously until the game is closed by the player. Besides, the "Sliding Art" window (code in MenuPlayer.java) is launched. It allows the player to be considered either as a new player, existing player or guest player. If the player is a new player, the player enters their name which is saved locally. If the player is an existing player, the player has their existence in the game verified by comparing their name to those already in the game by looking through the backups. Once the player has made their choice, this window is made invisible and the "Level" window (code in MenuLevel.java) opens.

The "Level" window allows the player to click on a home button that returns to the "Sliding Art" window, a gallery button that allows the player to choose an artwork and a level of difficulty for the sliding puzzle, and 3 buttons corresponding to 3 artworks linked to a different level of difficulty: 3x3 (simple), 4x4 (medium) and 5x5 (difficult). If the player clicks on the home button, the "Level" window closes and the "Sliding Art" window is set visible. If the player clicks on the gallery button, the "Level" window closes and the "Free Mode" (code in MenuFreeMode.java) window opens. If the player clicks on one of the 3 difficulty buttons, the "Level" window closes and the "Sliding Puzzle" (code in Puzzle.java) window opens.

The "Free mode" window allows the player to choose a level of difficulty (easy, medium or hard) and to choose an artwork, among those selected by the creators of the game, by clicking on the button with a puzzle image. Once the artwork and the level are chosen, the player can click on a start button and the "Level" window closes and the "Sliding Puzzle" window opens.

The "Sliding Puzzle" window allows the player to solve a sliding puzzle according to the level of difficulty they have chosen. Indeed, the sliding puzzle is displayed in a board either in 3x3 (easy), 4x4 (medium) or 5x5 (difficult) format. Furthermore, this window has a complete image of the artwork to allow the player to know in which order to put the pieces. There is also a pause button to pause the game, a home button to go back to the "Level" window, a restart button to start the sliding puzzle again, and a ranking button to access the players' ranking at the chosen difficulty level. There is also the player's time, which increases every second, and the number of moves made by the player until they finish the sliding puzzle.

About the sliding puzzle, it is contained in a board (code in Board.java) that contains tiles (code in Tile.java) with a part of the image (code in Figure.java) of the artwork, having coordinates (x, y) in the board. Plus, the board always contains one empty space having the same shape as a tile so that the tiles can move on the board. The number and size of the tiles depends on the level of difficulty chosen so that all the tiles fit in the board: 8 tiles in 3x3 (easy),

15 tiles in 4x4 (medium) and 24 tiles in 5x5 (hard). The tiles are shuffled into the board at the beginning of the game. The player can then move the tiles into the empty space provided. When a tile moves, the game implicitly checks that the move is possible (i.e., that the tile is directly next to the one empty space). If the move is possible, the moving tile exchanges places with the empty space. Eventually, the game ends once the (x, y) coordinates of each tile match the correct coordinates of the original image, i.e., the coordinates of the tiles before the tiles were shuffled at the beginning of the game. Once the sliding puzzle is finished, a small window opens and congratulates the player, then the "Sliding Puzzle" window closes and the "Level" window reopens.

If the player clicks on the home button, the "Sliding Puzzle" window closes and the "Level" window reopens. If the player clicks on the pause button, the board is made invisible, it's written "the game is paused", and the time and number of moves of the player are also paused (i.e., don't increase). If the player clicks again on the pause button, the board is set visible and the player can continue their game. If the player clicks on the restart button, all the tiles are shuffled and the time and number of moves of the player are reset. If the player clicks on the ranking button, the "Sliding Puzzle" window closes and the "Ranking" window (code in MenuRank.java) opens.

The "Ranking" window allows the player to see their ranking in relation to the other players who have already finished this level. This ranking is made according to the time taken by the players to finish a level of the sliding puzzle. Moreover, the "Ranking" window depends on the level chosen by the player, i.e., a ranking for each level of difficulty. The proposed ranking is the one associated with the current level of the player. The "Ranking" window displays the rank, the name and the time of the player. There is also a home button to return to the "Level" window. If the player clicks on the home button, the "Ranking" window closes and the "Level" window reopens.