

Design Sketch for Tetris (text-only)

TetrisApplication

TetrisApplication runs the program with “text” arguments

- Instance methods
 - main()

TetrisTextController

TetrisTextController is the controller for the Tetris game. It makes changes to the models based on user’s input. It also changes the view to reflect the models. Implements KeyListener.

- Instance variables
 - gameBoard – an instance of TetrisBoard
 - currentPiece – an instance of TetrisPiece
 - textView – an instance of TetrisView
 - location – an int to remember current location of the piece
 - score – an int to remember current score
- Instance methods
 - keyTyped – for KeyListener interface
 - keyPressed – for KeyListener interface
 - keyReleased – for KeyListener interface
 - updateBoard – update corresponding elements of board based on the current piece
 - updateLine – if there is a completed line, clear it and update each row of the board
 - createNewPiece – generate a randomly shaped and randomly located piece

TetrisPiece

TetrisPiece is a model for the Tetris game. It stores information about the current state of the piece. It has functions that can be called by the controller.

- Instance variables
 - piece – a two-dimensional boolean array of 4 rows and 4 columns
 - location – an int to remember the location of the piece
 - shape – an int to remember the shape of the piece
- Instance methods
 - zRotate – rotate the piece counter-clockwise
 - xRotate – rotate the piece clockwise
 - moveLeft – move the piece one block to the left
 - moveRight – move the piece one block to the right
 - moveDown – move the piece one block down
 - getLocation – return the location of the piece
 - assignShape – based on the random number passed in from Controller class, generate a shape accordingly

TetrisBoard

TetrisBoard is a model for the Tetris game. It stores information about the current state of the board.

- Instance variables
 - board – a two-dimensional boolean array of 18 rows and 10 columns
- Instance methods
 - getBoard – get the game board

- checkCompletedLine – return a boolean, check if there is a completed line
- attemptMoveRight – return a boolean, check if the attempted move can be achieved
- attemptMoveLeft – return a boolean, check if the attempted move can be achieved
- attemptMoveDown – return a boolean, check if the attempted move can be achieved
- attemptZRotate – return a boolean, check if the attempted rotate can be achieved
- attemptXRotate – return a boolean, check if the attempted rotate can be achieved
- isGameOver – return a boolean, check if the game is over

TetrisTextView

TetrisTextView is the view for the Tetris game. It prints the model to the console.

- Instance variables
 - gameBoard – an instance of TetrisBoard
- Instance methods
 - printBoard – prints the instructions, the current score, the game board, and pieces

Design Sketch for Tetris (GUI)

TetrisApplication

TetrisApplication runs the program without arguments.

- Instance methods
 - main()

TetrisGUIController

TetrisGUIController is the controller for the Tetris game. It makes changes to the models based on user's input. It also changes the view to reflect the models. Extends JComponent. Implements KeyListener. Implements ActionListener.

- Instance variables
 - gameBoard – an instance of TetrisBoard
 - currentPiece – an instance of TetrisPiece
 - view – an instance of TetrisView
 - timer – a Timer to automate the falling of the current piece
- Instance methods
 - paint – paint the gameBoard and the pieces on Graphics object
 - actionPerformed – automate the falling of the current piece
 - keyTyped – for KeyListener interface
 - keyPressed – for KeyListener interface
 - keyReleased – for KeyListener interface
 - paintBoard – paints the game board and pieces
 - updateBoard – update corresponding elements of board based on the current piece

- updateLine – if there is a completed line, clear it and update each row of the board
- createNewPiece – generate a randomly shaped and randomly located piece

TetrisPiece

TetrisPiece is a model for the Tetris game. It stores information about the current state of the piece. It has functions that can be called by the controller.

- Instance variables
 - piece – a two-dimensional boolean array of 4 rows and 4 columns
 - location – an int to remember the location of the piece
 - shape – an int to remember the shape of the piece
- Instance methods
 - zRotate – rotate the piece counter-clockwise
 - xRotate – rotate the piece clockwise
 - moveLeft – move the piece one block to the left
 - moveRight – move the piece one block to the right
 - moveDown – move the piece one block down
 - getLocation – return the location of the piece
 - assignShape – based on the random number passed in from Controller class, generate a shape accordingly

TetrisBoard

TetrisBoard is a model for the Tetris game. It stores information about the current state of the board.

- Instance variables
 - board – a two-dimensional boolean array of 18 rows and 10 columns

- Instance methods
 - `getBoard` – get the game board
 - `checkCompletedLine` – return a boolean, check if there is a completed line
 - `attemptMoveRight` – return a boolean, check if the attempted move can be achieved
 - `attemptMoveLeft` – return a boolean, check if the attempted move can be achieved
 - `attemptMoveDown` – return a boolean, check if the attempted move can be achieved
 - `attemptZRotate` – return a boolean, check if the attempted rotate can be achieved
 - `attemptXRotate` – return a boolean, check if the attempted rotate can be achieved
 - `isGameOver` – return a boolean, check if the game is over

TetrisGUIView

TetrisGUIView is the view for the Tetris game. It displays the models on the screen. Extends JPanel.