

Final Project – Final Design Document – Peter Hu’s Scrabble Program

Overview:

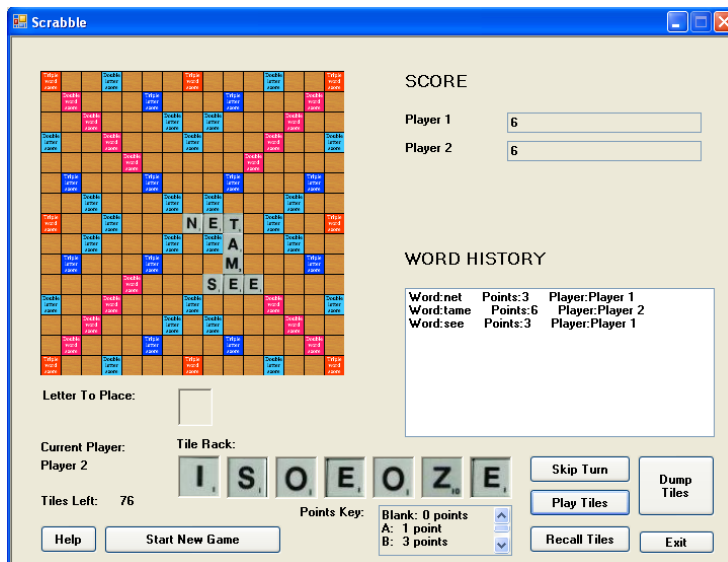
The program I am wrote is a Scrabble program. The goal of the program is to model the functionality of the real Scrabble board game. This program allows up to four players to make legal moves, keeps track of player scores, and utilizes a realistic playing board. The main features of this program are that of a simple user-interface to players, accurate computation and tracking of scores, and tolerance only for legal moves.

Design Details:

- USER INTERFACE
 - Set- up Interface



- Where the program opens and asks for player names
- Main Game Board interface.



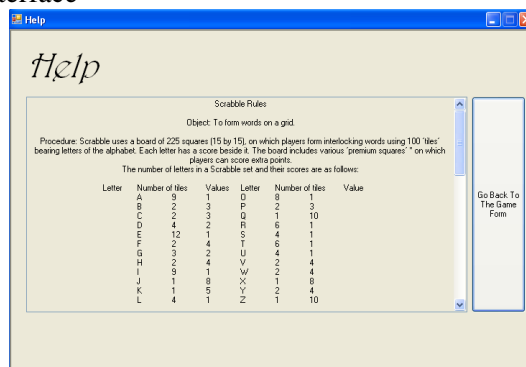
- Board
 - Where the tiles will be placed
- Current Player Interface
 - Where a player can view his rack of tiles and make actions.
 - Rack of tiles

- Rack of the 7 tiles a player has
- Skip button
 - Skips turn without dumping tiles are forming words
- Play Button
 - Forms words, checks for validity, and adds to the current player's score
- Help Button
 - Opens up the help form
- Dump Tiles Button
 - Dumps all 7 tiles of the current player for new random tiles. Skips the player's turn
- Start New Game Button
 - Opens the new game form
- Letter To Place Picture Box
 - Shows what letter will go on the board
- Statistical Display Interface
 - A variety of information displays
 - Score Board
 - Shows the player's scores
 - Current Player Display
 - Shows the current player
 - Tiles Left Display
 - Shows how many tiles are left in the letter bag
 - Points Key Text box
 - Shows how much each letter is worth
 - History/ Last word played
 - Log that keeps track of the last words created, the players who created the words, and the word's scores.
- End condition interface / Start new game interface



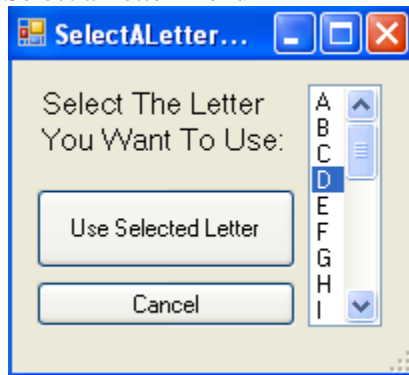
- Notify the user of who won or if players tied.
- Menu of options for the user to choose from when the game is over

- Help Interface



- Opens a form with the user manual and rules of the game.

- Select a Letter Menu



- When a blank tile is selected, this interface allows the user to define what letter he wants.

- RULES

- Win condition
 - When no more tiles are left in the bag, have the game finish and award a win to the player with the highest score.
- Legal tile placement
 - Tiles can only be placed adjacent to ones that have already been placed on the board except for the first.
- Agreement on created words
 - Any word(s) created by a tile must be agreed upon to be correct.

- CLASSES

- Letter Class
 - Inherited from tile class
 - FIELDS
 - Letter
 - Score
 - Tile Picture
 - METHODS
 - No methods
- Tile Class
 - FIELDS
 - image
 - METHODS
 - Draw method
- Scrabble Class
 - The brains of the program
 - FIELDS
 - Rectangle and bounds to draw the board into
 - Rows
 - Columns
 - Tile size
 - Current Letter
 - Current Turn Number
 - First move bool
 - Index of current tile rack
 - Letter bag
 - List of players
 - Index of the current player
 - List of letters for the word being made
 - Current player
 - Array of letters that live in the grid
 - List of points placed

METHODS

- Archive of locations of previously placed tiles
 - Define Grid Method
 - Draw Grid Method
 - Draw Method
 - Click Event Method
 - Valid Move Method
 - First Tile Valid Placement Method
 - Valid Tile Placement Method
 - Recall Tiles Method
 - Form Word Method
 - Change Current Player Method
 - Is There a Tile Above Method
 - Is There a Tile Below Method
 - Is there a tile to the left Method
- Player Class (Player objects will be held in an array)
 - currentPlayer Player object will keep track of the current player.
 - FIELDS
 - Name
 - List of letter tiles they have
 - Score
 - METHODS
 - No Methods
 - Letter bag Class
 - List of letters
 - FIELDS
 - List of Letters
 - Random number generator
 - Methods
 - Get Letter From Bag Method
 - Get List of Letters From Bag Method
 - Get Letter For Wild/Blank Tile
 - A=(9), B=(2), C=(2), D=(4), E=(12), F=(2), G=(3), H=(2), I=(9), J=(1), K=(1), L=(4), M=(2), N=(6), O=(8), P=(2), Q=(1), R=(6), S=(4), T=(6), U=(4), V=(2), W=(2), X=(1), Y=(2), Z=(1), Blank=(2).
 - Constructor fills with the correct amount of different letters.
 - Tiles are randomly drawn from the letter bag.
 - Word Class
 - List of Letters
 - FIELDS
 - List of Letters
 - METHODS
 - Method to get score
 - Method to get letters

Suggestions For Future Versions:

1. Add dictionary functionality
 - a. “Add word to dictionary” function.
 - b. Word Look-up
2. Double-letter score, triple-word score, etc...
3. Web, chat, and remote player interface.
4. Functionality for words that require tiles to be placed on the borders of the board.

5. Functionality to find more than one word.
6. Save and load game functions.
7. More advanced dump tile functionality - trade tile functionality.