

CW1 - Scrabble

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TASK 1

1 - Scrabble Official Rules

The game can be played with two to four players, and the main objective is to score more points than everyone else.

The Letters

Each letter is given a different value, with the less common letters being worth more, and the opposite also being true.

There is also a blank tile that can be used as a substitute for any letter in a word, and it will retain that letter for the rest of the game i.e. if it was used to replace the letter "A", it will stay as "A" on the board.

Scrabble Board

The board is a 15x15 tile in a square grid, each letter will equate to 1 tile on the grid.

Playing the Game

To start, each player will take seven tiles from the bag without looking inside, and the player with the closest letter to the letter "A" will go first, but if a Blank Tile is drawn, they will go first.

All players have three options to choose from. The first is to simply spell out a whole word, the second is to exchange a tile for a new one from the bag and finally they can pass to the next player. However, if any player passes twice in a row the game will end and the highest score will win.

Players will always have seven tiles each and are able to replace them each time they use them on the board. This will continue until there are no tiles left which will mark the end of the game, and thus the highest scoring player will win.

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Acceptable Words

All words found in the standard English Dictionary may be used, as well as an Official Scrabble Dictionary. There are no hyphens or apostrophes, so any words including those cannot be played and this also goes for words that use a capital letter.

Extra Point Values

There are multipliers on certain tiles on the board, if a tile is placed on these it will receive a either a 2x or 3x multiplier which will increase the value of the tile placed, for example, if the tile placed has a value of 4 on a 2x multiplier, it will be worth 8 points. Some of these multipliers can also multiply the whole word, not just individual tiles.

Double Letter Scores – There are tiles with a light blue outline, these are 2x multiplier tiles, and will double the value of any singular tile placed on it.

Triple Letter Score - There are tiles with a dark blue outline, these are 3x multiplier tiles, and will triple the value of any singular tile placed on it.

Double Word Score - There are tiles with a light red outline, these are 2x word multiplier tiles, and they run diagonally on the board. When a word is placed on these squares, the entire value of the word will be doubled.

Triple Word Score - There are tiles with a dark red outline, these are 3x word multiplier tiles. When a word is placed on these squares, the entire value of the word will be tripled. These are found on all four sides of the board and are equidistant from the corners.

One Single Use – The multiplier tiles are all only singular use, for example, if a word has been placed along a 2x multiplier, a new word placed that uses the letter on the 2x multiplier, will not receive the multiplication.

2 – Scrabble Computer Based Solution

Must Haves

A 15x15 board tile square with a grid.

100 tiles total in the game, with 2 blank tiles.

Each letter equates to one tile on the board.

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Allow for tiles to be swapped for a random one.

Two players, the computer and 1 user player

Display tiles on the board.

Display instructions at the start

Uncommon letters have more point values than others, increasing points with rarity and difficulty.

Blank tiles have no point values.

A turn can be passed to the next player.

Allow the player to place tiles can be placed on the board.

Game ends when all tiles have been used.

Display the winner at the end of the game.

Option to play again at the end of the game.

Game ends when turn has been passed twice.

Players will always have 7 tiles.

Tiles will contain one letter from the English Alphabet.

Should Haves

Display current computer and user score.

A blank tile will retain the same letter as it was substituted for.

A player can choose to exchange one or all tiles in their possession.

The player who draws the letter closest to "A" will start, or if they draw a blank tile.

The first player will place their word in the centre of the board.

Display all scores at the end of the game.

Words are built off the existing words, excluding the first one.

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Could have

Some squares offer multipliers for the value of the tile there.

Some squares multiply the total value of the word.

The points of the remaining tiles will be removed from their score.

The player who ended the game and has no remaining tiles will have a bonus score.

The tile values of all remaining players will be added to the score of the player who is out of tiles to produce the final score for the game.

First word score, the player who starts will start on a double square.

Would like to have

Other language version of the game

Special characters to be included.

A dictionary containing all legal words.

Multiplayer allowing for up to four total users.

Task 2: Implementation

1

There are multiple variables needed for snakes and ladders to work in a computer-based implementation. Assuming the game is a Player vs Computer implementation, below are the variables and what their uses are.

LetterPlaced – This variable is used to show what letter is placed on the board.

WordPlaced – This variable is used to validate the word that has been placed.

PlayerScore - This is used to display the player's score.

CpuScore – This is used to display the Computer's Score.

TileAvailable – This is used to check if the tile is available.

WordValue – This is used to calculate the value of the word placed.

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BlankTile – This is used to store the letter the blank tile has been turned into.

ReplaceTile – This is used to replace an existing tile in their current hand with a random tile.

LetterScore – All letters have a score associated with them and this is used to store that score.

DisplayWinner – This is used to display the winner.

GameStart – Used to start the game.

GameEnd - Used to finish the game early.

Board – This is a constant variable, as the number of tiles on the board will always be 15x15.

3

Here below are some of my sub-processes detailed using pseudocode.

FirstMove -

Display Tile for Player

Is it a blank tile?

Is CPU Tile closer to "A" than Player?

Display "CPU goes first"

CPU will place first word

CPU is FirstPlayer

Return

GamePlay -

Who's turn is it?

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Can CPU place a word?

Replace Tiles or Pass?

Replace One Tile or All Tiles?

CPU replaces all Tiles

Have tiles been replaced 2 turns in a row?

Display word on board

Calculate WordValue

Return

GameEnd -

Is CpuScore = PlayerScore?

Is CpuScore > PlayerScore?

Display "Player Wins!"

Remove All Tiles from Board

Return

References

Scrabble Rules - Scrabble Official Rules. (n.d.). Retrieved from Scrabble Pages:
<https://www.scrabblepages.com/scrabble/rules/>

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GRADEMARK REPORT

FINAL GRADE

76/100

GENERAL COMMENTS

Brief has been fulfilled with clear application of analytical and logical thinking to solutions.

More could have been contributed to the breakdown of the games rules using referenced information.

Flowcharts supplied are of a good standard and document is presented relatively well. Some formatting and double spacing could help overall professionalism of written piece.

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