CSC 480 Spring 2018 System Requirements

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Section 1 - Introduction:

Our purpose is to sufficiently outline and shape a system that can effectively deliver a unique variation of Scrabble™ to a workstation in the Richard S. Shineman Center of SUNY Oswego. The system will only interact with those close enough to connect a mobile device, laptop, or any device with web capabilities to the hardware.

1.1 System Definitions:

A.I. -	an artificial player-placeholder that continues playing the game, if there are zero or only one Player
Client -	the screen in which the player will interact with
'Dictionary' / Chosen Dictionary / Word Dictionary -	the database containing all the allowed words to be used in our game
Game Board -	the graphically displayed shape with smaller shaped inside it representing spots
'Game' -	refers to the system being created
Hand -	the set of letters a player is allowed to play onto the board
Player -	a person or AI actively playing the game.
Tile -	an item the size and shape of one spot on the game board that has a capital letter written on it with its corresponding point value

1.2 Misc Definitions

Abbreviation -	a shortened form of a word or phrase
Anagram -	a word, phrase, or name formed by rearranging the letters of another, such as *cinema*, formed from *iceman*.
Apostrophe -	a punctuation mark (') used to indicate either possession (e.g., *Harry's book* ; *boys' coats*) or the omission of letters or numbers (e.g., *can't* ; *he's* ; *class of '99*)
Cardinality -	the number of elements in a set or other grouping, as a property of that grouping.
Noun -	is the word used for a class of person, place or thing
Pronoun -	a word that can function by itself as a noun phrase and that refers

	either to the participants in the discourse (e.g., *I*, *you*) or to someone or something mentioned elsewhere in the discourse (e.g., *she*, *it*, *this*)
Proper Noun -	is the name of a person, place or thing (i.e., its own name); a proper noun always starts with a capital letter
Prefix -	a word, letter, or number placed before another.
Suffix -	a morpheme added at the end of a word to form a derivative, e.g., *-ation*, *-fy*, *-ing*, *-itis*.

Section 2 - Overall Description

2.1 Product Perspective

2.2 Product Functions

2.3 User Characteristics

2.4 Constraints

2.5 Assumptions and dependencies

Section 3 - System Requirements:

Section 3.1 - External Interface Requirements:

3.1.1 User interfaces

UI1.0	Functional	The primary monitor shall display information relating to the current game.
UI1.0.1	Functional	The current game statistics shall include the team scores, individual scores, and individual player usernames.
UI1.1	Functional	The primary monitor shall display the gameboard.
UI1.2	Functional	The primary monitor shall display information on each player.
UI2.0	Functional	The secondary monitor shall display information relating to overall game statistics.
UI2.1	Constraint	Any high scores that are displayed shall only be that of a human player.
UI3.0	Functional	The game board shall be a shape that allows the game to be playable.
UI3.1	Constraint	The game board shall not be circular.
UI3.2	Constraint	The game board shall be two-dimensional.
UI4.0	Functional	The game board and player information shall be displayed left of the current game scoreboard.
UI5.0	Functional	The overall stats should display the ten highest accumulated scores by human players.
UI5.0.1	Functional	The top accumulated scores shall be separated by team, five for each team.
UI5.1	Functional	The overall stats should display the five all-time highest word scores by human players.

3.1.2 Hardware interfaces

HI1.0	Constraint	The system must operate on a Intel Core i7-3770 CPU which runs at 3.40 GHZ on 8 cores.
HI2.0	Constraint	The system must work on a Gallium 0.4 on NVC1 graphics card.
HI3.0	Constraint	The system must not use more memory then is available on the computer.
HI4.0	Constraint	The data must not exceed the available storage on the hard drive.

3.1.3 Software interfaces

SI1.0	Constraint	The system must run on the Ubuntu 16.04 LTS operating system.
SI1.2	Constraint	The system must run on a 64-bit operating system.
SI2.0	Constraint	The system must work on the following browsers: Google Chrome, Mozilla Firefox, Internet Explorer, and Apple Safari.
SI3.0	Quality	The system must be tested on JUnit 5.

3.1.4 Communications interfaces

CI1.0	Functional	The game must be accessible from mobile devices.
CI1.1	Functional	Mobile devices include smartphones, tablets, and laptops.
CI2.0	Functional	Mobile devices must be able to communicate with the game via a wireless connection.
CI2.1	Functional	The user shall interact with the game via web browsers allowed in SI2.0.

3.2 - Functional Requirements

3.3 Performance Requirements

3.4 Design Constraints

DC1.0	Constraint	The game shall only use the English language.
DC2.0	Constraint	A game must have four players.
DC2.1	Functional	Either four human players, four A.I. players, or some combination of both.
DC3.0	Functional	The game shall have an English word dictionary.
DC3.1	Constraint	The dictionary shall not contain any proper nouns.
DC3.2	Constraint	The dictionary shall not contain any word that includes suffixes, abbreviations, and prefixes, or any word that requires a hyphen or apostrophe.
DC3.3	Functional	If a word does not exist in the chosen dictionary, it cannot be played.
DC3.3.1	Functional	All words formed from a tile being placed must exist in the chosen dictionary.
DC3.4	Constraint	Foreign words are not allowed to be placed on the board unless it is already in the dictionary described in DC3.0.
DC3.5	Constraint	There shall be no word deemed as profanity in the chosen dictionary.

DC4.0	Constraint	Each player will always start their turn with 7 tiles in their hand.
DC4.1	Functional	Each player's tiles should be visible to all other players.
DC5.0	Constraint	On their turn, a player must either add a new word to the board or replace existing tiles in their hand.
DC6.0	Constraint	The first player's word must cover the center space.
DC7.0	Functional	All words played by any player must share at least one letter with an existing word on the board.
DC7.1	Functional	Words played horizontal must be read from left to right.
DC7.2	Functional	Words played vertically must be read from top to bottom.
DC8.0	Functional	Blank tiles can represent any letter, but award no points.
DC8.1	Functional	A blank tile already played, cannot change its assigned letter.
DC9.0	Functional	The teams will be: Green and Gold.
DC9.1	Constraint	Once assigned a team they are permanently on that team.
DC10.0	Functional	The game client will display information pertinent to its human player.
DC10.1	Functional	Pertinent information includes, the gameboard and the player's tiles.
DC11.0	Functional	Each tile shall have a letter with a numeric value in one of the corners.
DC11.1	Constraint	The letter shall be bigger in print size then that of the numeric value.
DC12.0	Functional	On the game board, some spaces shall be allocated as multipliers.
DC13.0	Constraint	The game board must be significantly different from of Hasbro's scrabble board.
DC13.1	Constraint	Point values of tiles must differ from the official hasbro point distribution.

3.5 Software System Attributes

SA1.0	Functional	When a word is placed on the game board, the system shall search the word dictionary for the word.
SA2.0	Functional	There will be a seperate dictionary representing Oswego oriented words.
SA2.1	Functional	A certain set of proper nouns shall be created that somehow reference SUNY Oswego; thus are be exempt from Constraint DC3.1
SA2.2	Functional	A word referencing SUNY Oswego should receive a predetermined bonus to its score.
SA3.0	Functional	The sequence of players shall be determined randomly.
SA4.0	Functional	If a human player is inactive for a determined amount of time, replace them with an AI player.
SA5.0	Functional	Tiles used to form a word will be removed from that players hand.
SA5.1	Functional	After a word is played, the player will receive random tiles until they have 7.
SA6.0	Functional	An equivalent amount of randomly selected tiles will replace the players hand at the end of their turn.
SA7.0	Functional	Tiles on the board will persist until the game is over.
SA8.0	Functional	Information on the player includes: current tiles, current score, player name.
SA9.0	Functional	Relevant statistics shall be determined by developers.
SA10.0	Functional	The space with a multiplier will have a combination of one number followed by a “W” or “L”.
SA10.1	Functional	The “W” multiplier shall be applied to the summed value of the word or the ‘whole word’.
SA10.2	Functional	The “L” multiplier shall be applied to the individual letter placed

		on that space.
SA10.3	Functional	If a word is placed upon multiple multipliers, the “L” multiplier(s) is applied first, followed by any “W” multiplier(s).
SA11.0	Functional	When a word is played by a player, the total points earned are from all the tile values added together; along with the multipliers.
SA12.0	Functional	Multiple word multipliers will be resolved multiplicatively.
SA12.1	Functional	The multiplier space counts only once towards the player’s score.
SA13.0	Functional	Points shall be kept track of throughout the game.
SA14.0	Functional	Spaces allocated as multipliers will be randomly distributed every game.
SA14.1	Constraints	The constraints pertaining to how these are randomly distributed, are team dependent.
SA15.0	Functional	There shall be a bag of tiles.
SA16.0	Functional	The value of each tile will be determined preemptively by the developers.
SA17.0	Functional	Any other letters connecting to the tiles placed will also be added into the total score; so long as the subsequent connecting letters from a game legal word.
SA18.0	Functional	The AI shall use an anagram generator when playing.
SA19.0	Functional	Any player can quit and or forfeit during the game at any time.
SA19.1	Functional	All players should be given the option to play again or quit.
SA20.0	Functional	Players should be able to temporarily switch teams.
SA20.1	Functional	This an exception to DC9.1.

3.6 Other Requirements

OR1.0	Constraint	The chosen name of the game must be completely different from “Scrabble”.
OR2.0	Functional	The game shall end when there are no available moves.
OR2.1	Functional	There are no available moves if every space is filled.
OR2.2	Functional	There are no available moves if a player is unable to play at least one tile.
OR3.0	Functional	Each human player shall have a profile to track overall statistics.
OR3.1	Functional	If a human player does not have a profile, they shall be required to make one before playing.
OR3.2	Functional	The statistics tracked will be determined by the developers.
OR4.0	Functional	The player profile will be placed on a team.
OR5.0	Constraint	There will only be a single game running at any given time.
OR6.0	Functional	The player with the the most points at the end state is deemed the winner.
OR7.0	Functional	After a game had ended a new game will begin.
OR8.0	Functional	Extra Rules may be added so long as they are deemed fun by the stakeholders