SE 3XA3: Test Report
Wordle 2.0

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This document outlines the results of the tests performed on the Wordle 2.0 game to ensure its adherence to SRS requirements.

Table 1: **Revision History**

Date	**Version**	**Notes**
April 1, 2022	1.0	Initial document and tests for Gameplay Requirements
April 10, 2022	1.1	Finished Test Report

1 Functional Requirements Evaluation

1.1 Gameplay Requirements

1. **FR-GP1**
   Description: Test for the share functionality.
   Type: Manual
   Initial State: The Wordle 2.0 site has been initialized and a game has been played.
   Input: Share button clicked.
   Output: Player results copied to clipboard in the form of emojis.
   Expected: Player results copied to clipboard in the form of tile emojis.
   Result: PASS

2. **FR-GP2**
   Description: Test for key input functionality
   Type: Manual
   Initial State: The Wordle 2.0 site has been initialized.
   Input: Word "TREES" entered using on screen keyboard
   Output: Word accepted
   Expected: Word accepted.
   Result: PASS

3. **FR-GP3**
   Description: Test for tile colour functionality
   Type: Manual
   Initial State: The Wordle 2.0 site has been initialized.
   Input: Word entered with the same first letter as the target word.
   Output: First tile highlighted green.
   Expected: First tile highlighted green.
   Result: PASS

4. **FR-GP4**
   Description: Test for tile colour functionality
   Type: Manual

Initial State: The Wordle 2.0 site has been initialized.
Input: Word entered with the same last letter as the target word.
Output: Last tile highlighted green.
Expected: Last tile highlighted green.
Result: PASS

5. **FR-GP5**
   Description: Test for tile colour functionality
   Type: Manual
   Initial State: The Wordle 2.0 site has been initialized.
   Input: Word entered with a different first letter compared to the target word.
   Output: First tile highlighted grey.
   Expected: First tile highlighted grey or yellow.
   Result: PASS

6. **FR-GP6**
   Description: Test for word validity
   Type: Manual
   Initial State: The Wordle 2.0 site has been initialized.
   Input: "AAAAA" entered.
   Output: Alert displayed with the text "Word Not Found".
   Expected: Alert displayed with the text "Word Not Found".
   Result: PASS

7. **FR-GP7**
   Description: Test for word acceptance
   Type: Manual
   Initial State: The Wordle 2.0 site has been initialized.
   Input: "FISH" Entered.
   Output: Alert displayed with the text "Not Enough Letters".
   Expected: Alert displayed with the text "Not Enough Letters".
   Result: PASS

8. **FR-GP8**

Description: Test for letter recognition
Type: Manual
Initial State: The Wordle 2.0 site has been initialized.
Input: Word is entered with three of its letters matching the position of those in the target word.
Output: Three letters are highlighted green.
Expected: Three letters are highlighted green.
Result: PASS

9. **FR-GP9**
   Description: Test gameplay functionality
   Type: Manual
   Initial State: The Wordle 2.0 site has been initialized and a word has been entered.
   Input: Tester attempts to modify existing guess.
   Output: The game does not allow for changes to existing guesses.
   Expected:The game does not allow for changes to existing guesses.
   Result: PASS

10. **FR-GP10**
    Description: Test word length functionality
    Type: Automated
    Initial State: The Wordle 2.0 site has been initialized.
    Input: Automated script checks for the presence of word length button elements
    Output: Script returns true
    Expected: Script returns true
    Result: PASS

11. **FR-GP11**
    Description: Test word length functionality
    Type: Manual
    Initial State: The Wordle 2.0 site has been initialized.
    Input: Tester clicks "FOUR" button
    Output: Gameboard changes to four letters and all functionality is retained.

Expected: Gameboard changes to four letters and all functionality is retained.
Result: PASS

12. **FR-GP12**
Description: Test reset functionality
Type: Manual
Initial State: The Wordle 2.0 site has been initialized and the target word has been entered.
Input: Tester clicks "FIVE" button
Output: Gameboard is cleared and target word is changed.
Expected Gameboard is cleared and target word is changed.
Result: PASS

1.2 User Interface Requirements

13. **FR-UI1**
Description: Tester should be able to see the on-screen keyboard.
Type: Manual
Initial State: Empty web browser page
Input: Tester enters Wordle 2.0 URL.
Output: On-screen keyboard is displayed with QWERTY layout.
Expected On-screen keyboard is displayed with QWERTY layout.
Result: PASS

14. **FR-UI2**
Description: Tester should be able to see the tile gameboard.
Type: Manual
Initial State: Empty web browser page
Input: Tester enters Wordle 2.0 URL.
Output: Gameboard with 5 columns and 6 rows is displayed.
Expected Gameboard of the appropriate length is displayed..
Result: PASS

15. **FR-UI3**
Description: Tester should be able to select the dark theme.
Type: Manual
Initial State: Wordle 2.0 web page is initialized.
Input: Tester clicks on the theme button.
Output: The theme changes to dark mode.
Expected The theme changes to dark mode.
Result: PASS

16. **FR-UI4**
Description: Tester should be able to see the rules of the game.
Type: Manual
Initial State: Wordle 2.0 web page is initialized.
Input: Tester clicks on the rules button.
Output: Message box containing the Wordle 2.0 rules is displayed
Expected Message box containing the Wordle 2.0 rules is displayed.
Result: PASS

17. **FR-UI5**
Description: Tester should be able to see the player statistics.
Type: Manual
Initial State: Wordle 2.0 web page is initialized.
Input: Tester clicks on the statistics button.
Output: Message box containing player statistics displayed.
Expected Message box containing player statistics displayed.
Result: PASS

18. **FR-UI6**
Description: Tester should be able to see number of games played after each game
Type: Manual
Initial State: Wordle 2.0 web page is initialized.
Input: Tester enters target word
Output: Message box containing player statistics displayed.
Expected Message box containing player statistics displayed.

Result: PASS

19. **FR-UI7**
    Description: Tester should be able to see the win/loss ratio after each game
    Type: Manual
    Initial State: Wordle 2.0 web page is initialized.
    Input: Tester enters target word
    Output: Message box containing player statistics displayed.
    Expected Message box containing player statistics displayed.
    Result: PASS

20. **FR-UI8**
    Description: Tester should be able to see the current streak of correct guesses after each game
    Type: Manual
    Initial State: Wordle 2.0 web page is initialized.
    Input: Tester enters target word
    Output: Message box containing player statistics displayed.
    Expected Message box containing player statistics displayed.
    Result: PASS

21. **FR-UI9**
    Description: Tester should be able to see the best streak of correct guesses after each game
    Type: Manual
    Initial State: Wordle 2.0 web page is initialized.
    Input: Tester enters target word
    Output: Message box containing player statistics displayed.
    Expected Message box containing player statistics displayed.
    Result: PASS

22. **FR-UI10**
    Description: Tester should be able to see the guess distribution after each game

Type: Manual
Initial State: Wordle 2.0 web page is initialized.
Input: Tester enters target word
Output: Message box containing player statistics displayed.
Expected Message box containing player statistics displayed.
Result: PASS

2 Nonfunctional Requirements Evaluation

2.1 Look and Feel Tests

1. **NFR-LF1**
   Description: Tests the ease of use and playability of the game.
   Type: Manual
   Tester: Group of randomly selected participants.
   Pass Criteria: Survey score of at least $PERCENT\_AGREEMENT$.
   Result 95 percent of participants in agreement.
   Result: PASS

2. **NFR-LF2**
   Description: Tests that the design of Wordle 2.0 was inspired by the orginal Wordle game.
   Type: Manual
   Tester: Group of randomly selected participants.
   Pass Criteria: Survey score of at least $PERCENT\_AGREEMENT$.
   Result 100 percent of participants in agreement.
   Result: PASS

2.2 Usability

3. **NFR-UH1**
   Description: Tests that the game is playable by children at or above MIN_AGE
   Type: Manual

Tester: Group of randomly selected children.
Pass Criteria: Survey score of at least $PERCENT\_AGREEMENT$.
Result 87 percent of participants in agreement.
Result: PASS

4. **NFR-UH2**
   Description: Tests that the game is playable with one hand.
   Type: Manual
   Tester: Group of randomly selected participants .
   Pass Criteria: Survey score of at least $PERCENT\_AGREEMENT$.
   Result 100 percent of participants in agreement.
   Result: PASS

5. **NFR-UH3**
   Description: Tests that the game is of appropriate difficulty.
   Type: Manual
   Tester: Group of randomly selected participants .
   Pass Criteria: Survey score of at least $PERCENT\_AGREEMENT$.
   Result 100 percent of participants in agreement.
   Result: PASS

2.3 Performance

6. **NFR-P1**
   Description: Tests to see if game elements are added under MIN_TIME.
   Type: Automated
   Initial State: Wordle 2.0 web page is initialized.
   Input: Test script automatically enters 500 words and measures the time it takes for the element to appear in the page's HTML.
   Output: Average time of 0.06s.
   Expected Average time under MIN_TIME.
   Result: PASS

7. **NFR-P2**

Description: Tests to see if game page is loaded under MIN_TIME.
Type: Automated
Initial State: Wordle 2.0 web page is initialized.
Input: Test script automatically reloads page and measures the time needed.
Output: Average time of 0.11s.
Expected Average time under MIN_TIME.
Result: PASS

3 Comparison to Existing Implementation

The original game on which Wordle 2.0 is based, Not Wordle, did not contain any form of testing. With Wordle 2.0, we have documented the design process and written a comprehensive Software Requirements Specification to ensure that our software would behave as designed. To ensure adherence to the SRS, the development team has written 40 test cases, encompassing end to end testing, unit testing, and functional testing. The documentation and testing have allowed the team to create a product that is fully correct in its implementation and is also fully traceable from requirements to testing.

4 Unit Testing

Unit testing was conducted to test individual components within modules. This ensured that each module was correct in its behavior; an important aspect in applications with interconnected modular structures.

5 Changes Due to Testing

No changes were made as a result of testing to the module decomposition or internal design. Changes were made to the code to correct logical bugs revealed by testing. Graphical enhancements were made to the user interface in response to feedback gathered through the usability survey.

6 Automated Testing

Since Wordle 2.0 is a GUI based application, automated tests played a minimal part in the overall testing. Automated tests were done to ensure existence of HTML elements and structure, but could not thoroughly test the user interface. Selenium and Python's built-in assertion library were used to automate tests where appropriate.

7 Trace to Requirements

Table 2: **Traceability Matrix for UI Requirements**

		Requirements									
		FR1	FR2	FR3	FR4	FR5	FR6	FR7	FR8	FR9	FR10
Test Cases	FR-UI1	X									
	FR-UI2		X								
	FR-UI3			X							
	FR-UI4				X						
	FR-UI5					X					
	FR-UI6						X				
	FR-UI7							X			
	FR-UI8								X		
	FR-UI9									X	
	FR-UI10										X

Table 3: **Traceability Matrix for Gameplay Requirements**

		Requirements											
		FR11	FR12	FR13	FR14	FR15	FR16	FR17	FR18	FR19	FR20	FR21	FR22
Test Cases	FR-GP1	X											
	FR-GP2		X										
	FR-GP3			X									
	FR-GP4				X								
	FR-GP5					X							
	FR-GP6						X						
	FR-GP7							X					
	FR-GP8								X				
	FR-GP9									X			
	FR-GP10										X		
	FR-GP11											X	
	FR-GP12												X

Table 4: **Traceability Matrix for Non Functional Requirements**

		Requirements						
		LF1	LF2	UH1	UH2	UH4	P1	P2
Test Cases	NFR-LF1	X						
	NFR-LF2		X					
	NFR-UH1			X				
	NFR-UH2				X			
	NFR-UH4					X		
	NFR-P1						X	
	NFR-P2							X

8 Trace to Modules

Req.	Modules
FR1	M12, M14
FR2	M3, M12, M14
FR3	M4
FR4	M10
FR5	M9, M11
FR6	M9, M11
FR7	M9, M11
FR8	M9, M11
FR9	M9, M11
FR10	M9, M11
FR11	M16, M18
FR12	M1, M5, M16
FR13	M13, M7, M6, M2
FR14	M13, M7, M6
FR15	M13, M7, M6
FR16	M1, M15
FR17	M1, M15
FR18	M13, M6, M17
FR19	M5
FR20	M5
FR21	M5
FR22	M5, M15, M2

Table 5: Trace Between Requirements and Modules

9 Code Coverage Metrics

9.1 Symbolic Parameters

$MIN\_AGE = 10$
$MIN\_TIME = 0.25$
$UNIT\_TEST\_COVERAGE = 40$
$PERCENT\_AGREEMENT = 85$

References