

Software Engineering Group 17 Test Specification

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1. INTRODUCTION

1.1 Purpose of this Document

The purpose of this document is to describe all system tests to be executed for the “Chess Tutor” application. This document will provide a comprehensive testing guide that will be used to produce a Test Report.

1.2 Scope

This document features a comprehensive testing guide which describes the test reference, the functional requirement the test covers, the content of the test, the inputs, expected outputs, pass criteria and any draft notes. This document follows the format covered in SE.QA.06 [2] and SE.QA.02 [3].

This document should be read by all project members who write code and system tests. It is assumed that the reader is already familiar with the QA Plan [5] and UI Specification [4].

1.3 Objectives

This document is intended to:

- Provide a testing plan test the “Chess Tutor” application.
- Provide reproducible tests, the results of which will be entered into a Test Report to be submitted along with the Final Report.
- Provide tests that cover all functional requirements, external interface requirements, performance requirements and design constraints outlined in the System Requirements [6].

2. TEST SPECIFICATION

Test Ref	Requirement	Test Content	Input	Output	Pass Criteria
SE-F-001	FR1	Check that the menu prompts are displayed upon starting the application	Open the "Chess Tutor" application	All menu prompts are displayed on the screen	All menu prompts are displayed without any issue
SE-F-002	FR1	Check that the "New Game" prompt can be selected	Select "New Game" prompt	User setup screen appears for a new game	"New Game" prompt can be selected without issue
SE-F-003	FR1	Check that the escape key returns the user to the previous screen	Press the escape key	The previous screen is displayed	The user is navigated back to the main menu
SE-F-004	FR1	Check the new game setup allows Username entries	Enter a valid Username ("Dustin")	User can progress through the setup	User can progress with the valid User's name
SE-F-005	FR1	Check the new game setup does not allow an empty name entry	Enter no value into the User's name ("")	User is prompted to enter a valid Username.	User is unable to progress with the invalid User's name
SE-F-006	FR1	Check that the "New Game" setup does not allow username with invalid characters (new lines characters, special characters)	Input a username with a inappropriate characters ("Ch£\$sTu!0r\n")	Error text message explaining it has invalid characters, and what the valid set is.	An error message should appear on screen
SE-F-007	FR1	Check that the program responds correctly to a name which exceeds the character limit of 20	Input a username that exceeds the character limit of 20 ("Group17ChessTutorUser")	Error text message explaining the name is too short/long, what the valid range is.	An error message should appear on screen
SE-F-008	FR1	Check that the "Submit" prompt can be selected	Select "Submit" prompt with valid setup Inputs (SE-F-009)	The new game initialises, and the chess board is displayed.	"Submit" prompt can be selected without issue
SE-F-009	FR1	Check that the "Load Game" prompt can be selected if a save file is available	Select "Load Game" prompt with valid save files available	The "Load Game" menu is displayed on the screen	"Load Game" prompt can be selected without issue

SE-F-010	FR1	Check that the "Load Game" prompt cannot be selected if no save files are available	Select "Load Game" prompt with no save files available	User is prompted that no save files are available	"Load Game" menu does not load, and error message is displayed
SE-F-011	FR1	Check that the "Quit" prompt can be selected without issue	Select "Quit" prompt	"Chess Tutor" application closes	The application closes (this game is not saved)
SE-F-012	FR2	Check that the username entries are saved to the file	Setup a new game (SE-F-002), save game. Observe file	Name data is stored in save file	Name entries are stored withing save file
SE-F-013	FR2	Check that the User colour is kept track of in save file	Setup a new game (SE-F-002), save game. Observe file	Colour data is stored in save file	Colour data is present in file and correct
SE-F-014	FR2	Check that the Users pieces are kept track of (initial state)	Setup a new game (SE-F-002), save the game quit and reload the game. Observe board	User pieces still in play for each User stored in save file	All User pieces should be stored in save file as still in play as none have been taken
SE-F-015	FR2	Check the Users pieces are kept track of after a piece is taken	Setup a new game (SE-F-002), take black Pawn (0,1), save the game, quit and reload the game. Observe board	User pieces still in play for each User stored in save file	All pieces still in play should be stored in the save file
SE-F-016	FR2	Check the initial position of the pieces is correct	Setup a new game (SE-F-002), save the game, quit and reload the game. Observe File	User piece position stored in the save file	The initial positions of the pieces are correct
SE-F-017	FR3	Check that White moves first	Setup a new game (SE-F-002).	The white pieces appear at the bottom of the board	The white pieces are stored at the bottom of the board
SE-F-018	FR3	Check that the program indicates whose turn it is	Setup a new game (SE-F-002), white player move Pawn (0,6), black player move Pawn (0,1)	The board flips such that the current players' pieces are at the bottom of the screen	The board is displayed correctly for the current player

SE-F-019	FR3	Check that the pieces are presented in an unambiguous way	Setup a new game (SE-F-002)	The board display the correct textures for each piece	All pieces have the correct texture
SE-F-020	FR4	Check that only the current User's pieces can be selected	Setup a new game (SE-F-002), try and select a White piece, then try and select a Black piece	Nothing happens, a Black piece cannot be selected during White player's turn	Black piece is not allowed to be selected; the White piece should be allowed to be selected
SE-F-021	FR4	Check that the User can select different pieces during their turn	Setup a new game (SE-F-002), try and select a White pawn (0,6), then try and select another White pawn. (1,6)	The UI should highlight the selected pawn, and unhighlight it when the other pawn is selected. The second pawn should be highlighted.	The program will display the first piece as selected, when the second pawn is selected, the first pawn will become unselected.
SE-F-022	FR4	Check that the pieces change appearance when selected	Setup a new game (SE-F-002), select a White pawn	The White pawn will be highlighted when selected.	White pawn highlight should display correctly.
SE-F-023	FR4	Check the program responds correctly when the user during piece selection clicks outside the board.	Click outside of the board with the mouse on the white player's name.	No changes will occur	The program should do nothing.
SE-F-024	FR4	Check the User can't select a piece after they've moved another piece that turn.	Setup a new game (SE-F-002), move a Pawn (0,6), then try and select another Pawn (1,6).	The piece can't be selected.	The program should not allow the user to select a piece after they've moved one on their turn.
SE-F-025	FR5	Check to see if the program responds when the user tries to move their own piece onto a friendly piece	Start a new game, select white Rook (0,7) and click on the friendly white Knight (1,7)	Nothing will happen.	Nothing will happen, as you cannot move your own piece onto a friendly piece
SE-F-026	FR5	Check that all the legal moves are displayed when a Pawn is selected	Select a Pawn piece during a game (0,6)	The program highlights all legal moves in white	Only legal moves are displayed on the screen
SE-F-027	FR5	Check the Pawn can only move 1 or 2	Select White Pawn (0,6), move 2 spaces to (0,4). Select Black	The Pawns perform all legal moves	The Pawn can move 1 or 2 spaces as its first move

		spaces for its first move	Pawn (0,1) and move 1 space to (0,2)		
SE-F-028	FR5	Check the Pawn can only move 1 space for every move that is not its first	Select White Pawn (0,6), move 2 spaces to (0,4). Select Black Pawn (0,1) and move 1 space to (0,2). Select White Pawn at (0,4) and move 1 space to (0,3)	The Pawn only shows the space in front of it as its legal move	The Pawn can only move 1 space as its second move
SE-F-029	FR5	Check that a Pawn can take a piece diagonally forward	Select White Pawn (0,6) and move 2 spaces to (0,4). Select Black Pawn (1,1) and move 2 spaces to (1,3). Select White Pawn (0,4) and take Black Pawn (1,3)	The White Pawn moves diagonally from (0,4) to take the Black Pawn at (1,3)	The taken Black Pawn is removed from the board and the White Pawn replaces it.
SE-F-030	FR5	Check that a Pawn can perform en passant to take a piece	Select White Pawn (0,6) and move 2 spaces to (0,4). Select Black Pawn (7,1) and move 2 spaces to (7,3). Select White Pawn (0,4) and move 1 space to (0,3). Select Black Pawn (1,1) and move 2 spaces to (1,3). Select White Pawn (0,3) and take Black Pawn (1,3) by moving to (1,2), performing en passant	The White Pawn (0,3) moves to (1,2) and takes the Black Pawn at (1,3)	The Black Pawn is removed from the board
SE-F-031	FR5	Check that all legal moves are displayed when a Rook is selected	Select White Pawn (0,6) and move 2 spaces to (0,4). Select Black Pawn (1,1) and move 2 spaces to (7,3). Select a rook piece during a game (0,7)	The program will highlight all moves	All moves are displayed
SE-F-032	FR5	Check that a Rook can move Orthogonally	Select White Pawn (0,6) and move 2 spaces to (0,4). Select Black pawn (1,1) and move 2 spaces to (1,3). Select White Rook (0,7) and move	The Rook will move vertically and diagonally	Orthogonal movement is achieved

			2 spaces to (0,5). Select Black Rook (0,0) and move 2 spaces to (0,2). Select White Rook (0,5) and move 7 spaces to (7,5)		
SE-F-033	FR5	Check that a Rook can move Orthogonally to take pieces	Select White Pawn (0,6) and move 1 space to (0,5). Select Black pawn (1,1) and move 2 spaces to (1,3). Select White Pawn and move 1 space to (0,4). Select Black Pawn (1,3) and take White Pawn (0,4). Select White Rook (0,7) and take Black Pawn (0,4)	The Black Pawn takes the White Pawn, and the White Rook take the Black Pawn.	The Black and White Pawns are removed from the board
SE-F-034	FR5	Check that all legal moves are displayed when a Knight is selected	Select a Knight piece during a game (1,7)	The program will highlight all moves	All moves are displayed
SE-F-035	FR5	Check a Knight can move in L-shape	Select White Knight (1,7) and move to (0,5)	The Knight moved in an L-shape to an empty square	The Knight's move is legal
SE-F-036	FR5	Check a Knight can take a piece with L-shape movement	Select White Knight (1,7) and move to (2,5). Select Black Pawn (3,1) and move 2 spaces to (3,3). Select White Knight (2,5) and take Black Pawn (3,3)	White Knight replaces Black Pawn (3,3)	White Knight uses L-shape movement to remove Black Pawn from the board
SE-F-037	FR5	Check that all legal moves are displayed when a Bishop is selected	Select a Bishop piece during a game (2,7)	The program will highlight all moves	All moves are displayed
SE-F-038	FR5	Check a Bishop can move diagonally	Select White Pawn (3,6) and move to (3,4). Select Black Pawn (7,1) and move to (7,3). Select White Bishop (2,7) and move to (7,2)	The Bishop moves diagonally to the empty square	Only legal moves are displayed

SE-F-039	FR5	Check a Bishop can take a piece diagonally	Select White Pawn (3,6) and move to (3,4). Select Black Pawn (7,1) and move to (7,2). Select White Bishop (2,7) and take Black Pawn at (7,2),	The Bishop moves diagonally to take the Black Pawn	White Bishop performs a legal move to take Black Pawn
SE-F-040	FR5	Check that all legal moves are displayed when a Queen is selected	Select a Queen piece during a game (3,7)	The program will highlight all moves	All moves are displayed
SE-F-041	FR5	Check a Queen can move diagonally and orthogonally	Select White Pawn (4,6) and move to (4,4). Select Black Pawn (7,1) and move to (7,2). Select White Queen (3,7) and move to (7,3). Select Black Pawn (0,1) and move to (0,2). Select White Queen (7,3) and move to (0,3)	Queen can move diagonally and orthogonally to the empty squares	Only legal moves are displayed
SE-F-042	FR5	Check a Queen can take a piece diagonally and orthogonally	Select White Pawn (4,6) and move to (4,4). Select Black Pawn (7,1) and move to (7,3). Select White Queen (3,7) and take Black Pawn at (7,3). Select Black Pawn (0,1) and move to (0,3). Select White Queen (7,3) and take Black Pawn at (0,3)	Queen can move diagonally and orthogonally to take the Black Pawns	White Queen performs legal moves to take the Black Pawns
SE-F-043	FR5	Check that all legal moves are displayed when a King is selected	Select a King piece during a game (4,7)	The program will highlight all moves	All moves are displayed
SE-F-044	FR5	Check a King can move 1 square diagonally or orthogonally	Select White Pawn (5,6) and move to (5,4). Select Black Pawn (7,1) and move to (7,3). Select White King (4,7) and move to (5,6). Select Black Pawn (7,3) and move to (7,4). Select White	King moves diagonally and orthogonally to empty squares	Only legal moves are displayed

			King (5,6) and move to (5,5)		
SE-F-045	FR5	Check a King can take a piece by moving 1 square diagonally	Select White Pawn (5,6) and move to (5,4). Select Black Pawn (4,1) and move to (4,3). Select White King (4,7) and move to (5,6). Select Black Pawn (4,3) and take White Pawn (5,4). Select White King (5,6) and move to (5,5). Select Black Pawn (0,1) and move to (0,3). Select White King (5,5) and take Black Pawn at (5,4)	King moves diagonally and orthogonally to take a Black Pawn	White King performs legal moves to take the Black Pawn
SE-F-046	FR5	Check left side castling rule is implemented correctly	Perform a Queen-side Castle	The board will update to reflect the move	The move should work as explained in the chess rules [1]
SE-F-047	FR5	Check right side castling rule is implemented correctly	Perform a King-side Castle	The board will update to reflect the move	The move should work as explained in the chess rules [1]
SE-F-048	FR5	Check pieces can't move off the board	Attempt to move the White Rook (7,0) to the left	Nothing happens, pieces cannot be moved off the board.	The program should not allow the User to move a piece off the board
SE-F-049	FR6	Check that check is correctly detected for the Black King	Move White Pawn (4, 6) to (4, 5). Move Black Pawn (5, 1) to (5, 2). Move White Queen to (7, 3)	A red highlight will appear around the Black king	The program should detect the User is in check
SE-F-050	FR6	Check that check is correctly detected for the White King	Move White Pawn (5, 6) to (5, 5). Move Black Pawn (4, 1) to (4, 2). Move White Pawn (5, 5) to (5, 4). Move Black Queen to (7, 4).	A red highlight will appear around the White King	The program should detect the User is in check
SE-F-051	FR7	Check that the game detects when the	Checkmate Black when playing as White". [7]	The "Game Over" screen is shown, a red highlight is shown	The game ends and cannot be continued

		White King is in checkmate		around the Black King	
SE-F-052	FR7	Check that the game detects when the Black King is in checkmate	Checkmate White when playing as Black". [7]	The "Game Over" screen is shown, a red highlight is shown around the White King	The game ends and cannot be continued
SE-F-053	FR8	Check the name of the winning User is displayed in the 'Game Over' screen	One User checkmate's the other's King. [7]	The 'Game Over' screen will display the correct Users name	The winner's name is displayed
SE-F-054	FR8	Check the Main Menu button appears in the "Game Over" screen	One User checkmate's the other's King. [7]	The 'Game Over' screen will display the button to return to the main menu	Functional button return to the main menu is shown
SE-F-055	FR8	Check that the game ends when White chooses to resign	The White Player pauses the game and chooses to resign	The game will be saved and ended. The Game Over screen display the name of the Black player as the winner, and a button to return to the main menu	The game is saved and can be continued when the Users decide to resume it
SE-F-056	FR8	The game ends when Black chooses to resign	The Black Player pauses the game and chooses to resign	The game will be saved and ended. The Game Over screen display the name of the White player as the winner, and a button to return to the main menu	The game is saved and can be continued when the Users decide to resume it
SE-F-057	FR8	White can call a draw and Black can accept	The White Player pauses and calls a draw, and the Black Player can accept	A 'Game Over' screen shows that the game ended in a draw	The draw is accepted and the game ends, displaying that the game ended in a draw
SE-F-058	FR8	Black can call a draw and White can accept	The Black Player pauses and calls a draw, and the White Player can accept	A 'Game Over' screen shows that the game ended in a draw	The draw is accepted and the game ends, displaying that the game ended in a draw
SE-F-059	FR8	White can call a draw and Black can decline	The White Player pauses and calls a	The game continues	The game will be un-paused and continue

			draw, and the Black Player can decline		
SE-F-060	FR8	Black can call a draw and White can decline	The Black Player pauses and calls a draw, and the White Player can decline	The game continues	The game will be un-paused and continue
SE-F-061	FR9	White Player can choose to quit the game at any time	The White Player pauses the game and chooses to quit	The “Game Over” screen is shown, the game is saved, and the user is returned to Main Menu	The Users are returned to the main menu
SE-F-062	FR9	Black Player can choose to quit the game at any time	The Black Player pauses the game and chooses to quit	The “Game Over” screen is shown, the game is saved, and the user is returned to Main Menu	The Users are returned to the main menu
SE-F-063	FR9	Can the White Player exit the pause menu	The White Player selects “Continue” to exit the pause menu	The pause menu disappears	The game is resumed
SE-F-064	FR9	Can the Black Player exit the pause menu	The Black Player selects “Continue” to exit the pause menu	The pause menu disappears	The game is resumed
SE-F-065	FR10	Are all saved games shown	The User selects “Load Game” in the main menu	The list of saved games is shown	All saved games are shown
SE-F-066	FR10	Can the User select a game to load	Start a new game. Save the game. Reload the saved game.	The game loads correctly	All the pieces are in the correct positions
SE-F-067	FR10	Are all the pieces in the correct positions	Start a new game, Move a piece (SE-F-027) Save the game, Reload the saved game.	The game is loaded, and the pieces are in the correct positions	All the pieces are in the correct positions
SE-F-069	FR10	Are all the pieces that were removed from the board still removed	Start a new game, Take a piece (SE-F-029). Save the game, Reload the saved game.	The game is loaded and removed pieces do not show	All the pieces that were removed are still removed

SE-F-069	FR10	Does the game load the showing the king is in check.	Start a new game. Put a king in check (SE-F-049/050). Save the game. Reload the game	The game is loaded with the King highlighted in red	The JavaFX for a King in check is loaded for the White/Black King
SE-F-070	FR10	Does the game load the correct Usernames assigned to the correct colours	Start a new game. Save the game. Reload the saved game.	The game is loaded and the usernames are displayed correctly	The Users will have the same names as when they last played the game
SE-F-071	FR10	Can the White Player choose to move forwards and backwards through the game on their turn	The White Player moves White Pawn (0,6) to (0,4), presses the left arrow key to undo the move, then the right arrow key to redo the move	The game undoes and redoes the turn based on the White Players input	The action performed matches the correct input
SE-F-072	FR10	Can the Black Player choose to move forwards and backwards through the game on their turn	The Black Player moves Black Pawn (0,1) to (0,3), presses the left arrow key to undo the move, then the right arrow key to redo the move	The game undoes or redoes a turn based on the Black Players input	The action performed matches the correct input
SE-F-073	FR11	The game is saved in its entirety when a User chooses to quit	When in a game, open the menu and select "Save and Quit"	The game data is written to a .json file	The correct data is written and saved to the .json file
SE-F-074	FR11	The game is saved and does not overwrite another saved game	When in a game, open the menu and select "Save and Quit"	The game data is written to a .json file	The game is added to a .json file and all other game saves are still in the same file
SE-F-075	FR11	Check if the program is closed during a game, was the last move saved	White moves Pawn (0,6) and then closes the game without pausing and choosing to quit	The game is closed, and the User is sent to the main menu. They select "Load Game" and load the game that just crashed. The last move was saved	The previous game is shown in the list of saved games, and everything is correct when loaded (refer to previous tests for FR10 and FR11)
SE-F-076	FR11	Check to see if program responds correctly when the user attempts to load	Load test_bad_ext.txt game file	Error text message explaining the accepted file extension.	An error message must appear.

		a save file with the wrong extension			
SE-F-077	FR11	Check to see if program responds correctly when the user attempts to load a save file in an incorrect format	Load test_bad_format.json using an incorrect format	Suitable error text message explaining the file is not in the correct format.	An error message must appear.
SE-P-001	PR1	Check the response of the program to user input (Should take under a second)	Start the chess tutor program. Play a new, full game of chess.	All actions will be reflected in the program within one second.	The program must respond correctly to user input within 1 second.
SE-P-002	PR2	Check if the program works on Information Services PC's	Start the chess tutor program on an Information Services PC. Play a new, full game of chess.	The program works as intended.	There should be no error when running the program on an Information Services PC.
SE-E-003	EIR1	Check the appearance of the interface resembles Microsoft Windows standards.	Start the chess tutor program and navigate through all screens.	All screens are outputted with the correct appearance/formatting.	All screens must resemble Microsoft Windows standards for application appearance.

Figure 1: Testing table for Chess Tutor Program

REFERENCES

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DOCUMENT HISTORY

Version	Issue No.	Date	Changes made to document	Changed by
0.1	10	26/02/23	N/A	GWC1
0.2	10	27/02/23	Added Tests	KIF11
0.3	10	27/02/23	Filled in section 1	GWC1
0.4	10	28/02/23	Removed duplicate tests	GWC1
0.5	10	28/02/23	Made document structure changes	KIF11
0.6	18	01/03/23	Adjusted Document Formatting	KIF11
0.7	18/19	04/03/23	Added Tests	GWC1
0.8	19	05/03/23	Added Tests	GWC1
0.9	19	06/03/23	Updated references	GWC1
0.10	19	06/03/23	Updated test table after feedback from review meeting	ADE12, KIF11
1.0	10	06/03/23	First release	GWC1
1.1	27/28	19/03/23	Changes highlighted in feedback	KIF11
1.2	27/28	20/03/23	More changes highlighted in feedback	KIF11
1.3	27/28	22/02/23	Made some tests more repeatable	KIF11
1.4	32/33	15/04/23	Test and document amendments	KIF11
1.5	33	17/04/23	Test amendments	KIF11
1.6	34	24/04/23	Added additional tests	KIF11
1.7	N/A	02/05/23	Minor Re-formatting / Content Changes	DUB4