

Software Engineering GP02 Project Testing Specification

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CONTENTS

CONTENTS	2
1. INTRODUCTION	3
1.1 Purpose of this Document	3
1.2 Scope.....	3
1.3 Objectives.....	3
1.4 Save File Testing.....	3
2. TEST SPECIFICATIONS	3
REFERENCES	23
DOCUMENT HISTORY	24

1. INTRODUCTION

This document specifies testing information including system tests that the program will be tested against.

1.1 Purpose of this Document

The purpose of this document is to ensure the program is robust and to detect bugs in the program that can be addressed and fixed. This document will also contain test reports.

1.2 Scope

This document should be read by the system programmers and testers.

1.3 Objectives

The objective of this document is to keep a record of system tests. This includes test content, input, output and pass criteria, as well as reports on the tests that have been done.

1.4 Save File Testing

Save files have been created to consistently carry out the tests in FR11 that concern game loading. These can be found in the repository along with a readme detailing what each save file contains and what test it correlates to.

2. TEST SPECIFICATIONS

Test Ref	Req being tested	Test Content	Input	Output	Pass Criteria
SE-P1-001	PR1	Check that the program is responsive to user input within 1 second	Start a new game. Move white pawn from E2 to E3.	The pawn is moved	The game is started in under 1 second. The pawn is moved from E2 to E3 in under 1 second
SE-P2-001	PR2	Check that the program runs on Aberystwyth IS PCs	Try to run the program on Aberystwyth IS PCs	The program runs	The program starts and runs without issues

Test Ref	Req being tested	Test Content	Input	Output	Pass Criteria
FR1 – Player Setup					
SE-F1-001	FR1	Check that when the program starts the players are prompted to start a new game or restore a previous game	None	A prompt for what the user wants to do should be displayed	The game opens and prompts the user
SE-F1-002	FR1	Check that pressing 'start a new game' functions properly	Press start new game	Further prompts for information should be displayed	The game prompts the users for their names and who is playing the white/black pieces
SE-F1-003	FR1	Check that pressing restore previous game functions properly	Press restore previous game	Further prompts for information should be displayed	The players should be prompted to specify a saved game
SE-F1-004	FR1	Check that when prompted for usernames, giving a blank value is rejected	No value for first user prompt. Then rerun the test for the second user prompt	Error message warns of blank value, re-send name prompt	The value should be rejected and the code to prompt and assign the username should re-run
SE-F1-005	FR1	Check that when a player selects black, they are assigned black, and the other player assigned white	Click black	Player who clicked is assigned black	The user that picked black should be assigned black and the other player assigned white
FR2 – Player Management					
SE-F2-001	FR2	Check that the program will keep track of each player's name and color	Input 'user black' for one user, and 'user white' for the other. Click black for user black	'User black' is assigned black, 'User white' is assigned white	The program displays 'user black' with the black pieces, and 'user white' with the white pieces
SE-F2-002	FR2	Check that the position of a piece is updated when it moves	Start fresh game. Move white pawn from D2 to D3. Move black pawn from A7 to A6. Move white king from D1 to D2	Black pawn at A6, white pawn at D3, white king at D2	A display of the board in starting position, except A7 and D1 are empty. A black pawn in A6. A white pawn in D3. White king in D2
SE-F2-003	FR2	Check that a black piece is removed when it is taken by a white piece	Start fresh game. Move white pawn from D3 to D4. Move black pawn from E7 to E5. Move white pawn from D4 to E5	Black pawn is removed from play, white pawn is on E4	Black pawn on E5 has been removed from the board. White pawn is on E5. Out of play Black pawn is displayed on the side of the board
SE-F2-004	FR2	Check that a white piece is removed when it is taken by a black piece	Start fresh game. Move white pawn from D2 to D4. Move black pawn from E7 to E5. Move white pawn from E2	White pawn is removed from play. Black pawn is at D4	White pawn on D5 has been removed from the board. Black pawn is on D5. Out of play white pawn is

			to E3. Move black pawn from E5 to D4		displayed on the side of the board
FR3 – Board Management					
SE-F3-001	FR3	Check the board is displayed correctly.	Start game	Chess board is displayed with pieces in the starting position	There is a chess board with pieces in the correct places
SE-F3-002	FR3	Check that when the game starts it is visually indicated that it is white's turn	Continue from last test	It is white's turn, and this is shown on screen	The white players Name should be displayed in the top right
SE-F3-003	FR3	Check that after white's turn has been made it is visually indicated that it is black's turn	Continue from last test. Make any move for white	It is black's turn, and this is shown on screen	The black player's Name should now be displayed on the top right
FR4 – Piece Selection					
SE-F4-001	FR4	Check that selecting an empty space does nothing	Start a fresh game. Try to select squares at A3, H6, and D4.	The chess board is displayed with pieces in the starting places	The chess board is displayed with pieces in the starting places, and clicking the empty spaces does nothing
SE-F4-002	FR4	Check that during white turn white pieces can be selected	Start a fresh game. Select white pawn at D2.	The board displays with pieces in starting positions	The piece will be selected, and the program will display possible moves for D3 pawn
SE-F4-003	FR4	Check that during white turn black pieces cannot be selected and moved	Start a fresh game. Try to select black knight at G8.	The board displays with pieces in starting positions	The piece should not be selected
SE-F4-004	FR4	Check that during black turn black pieces can be selected	Start a fresh game. Move white pawn at F2 to F3. Select black pawn at C7.	The board displays with pieces in starting positions	Pawn at C7 is selected and displays possible moves
SE-F4-005	FR4	Check that during black turn white pieces cannot be selected and moved	Continue from last test, try to select white king at E1.	The board displays with pieces in starting positions	The piece should not be selected
SE-F4-006	FR4	Check that when it is white's turn a white piece can be selected, then another white piece can be selected so long as the first piece is not moved	Start a fresh game. Select pawn at E2. Then, without moving it, select rook at H1.	The board displays with pieces in starting positions	The program displays possible moves for the pawn at E2 when it is clicked, then when the rook at H1 is clicked the possible moves for the pawn disappear, and possible moves for the rook are displayed
SE-F4-007	FR4	Check that when it is black's turn a black piece can be selected, then another black piece can be selected so long as the first piece is not moved	Continue from last test, move white pawn at H2 to H3. Select black knight at B8, then, without moving it, select black pawn at F7.	The board displays with pieces in starting positions	The program displays possible moves for the queen when it is clicked, then when the pawn is clicked the possible moves for the queen disappear, and

					possible moves for the pawn are displayed.
FR5 – Movement					
Pawn Movement					
SE-F5-001	FR5	Check the pawn displays correct possible moves on its first move	Start a fresh game, Select pawn at C2	The board displays with pieces in starting positions	Display possible moves that the pawn at C2 can be moved to C3 or C4
SE-F5-002	FR5	Check the pawn can move one vacant place on its first move	Start a fresh game, select pawn at C2 and move it to C3	The board displays and the pawn is moved	C3 is occupied by a pawn, C2 is empty
SE-F5-003	FR5	Check the pawn can move two vacant places on its first move	Start a fresh game, select pawn at C2 and move it to C4	The board displays and the pawn is moved	C4 is occupied by a pawn, C2 is empty
SE-F5-004	FR5	Check the pawn displays correct possible moves on its second move	Start a fresh game, Move pawn from C2 to C3. Make any move on black side. Select pawn at C3	The board displays and the pawn is moved	Pawn is moved to C3. When clicked again display possible moves that the pawn at C3 can be moved to C4
SE-F5-005	FR5	Check the pawn can-not move three vacant places on its first move	Start a fresh game, select pawn at C2 and attempt to move it to C5	The board displays with pieces in starting positions	Pawn is not moved
SE-F5-006	FR5	Check the pawn can move one vacant place when it is not its first move	Start a fresh game, select pawn at C2 and move it to C3. Make any move on black side. Select pawn at C3 and move it to C4	The board displays and the pawn is moved	C4 is occupied by a pawn, C2 is empty
SE-F5-007	FR5	Check the pawn can-not move two vacant places when it is not its first move	Start a fresh game, select pawn at C2 and move it to C3. Make any move on black side. Select pawn at C3 and attempt to move it to C5	The board displays and the pawn does not move two spaces	C3 is occupied by a pawn, C2 is empty. Pawn is not moved from C3 to C5
SE-F5-008	FR5	Check the pawn cannot move three vacant places when it is not its first move	Start a fresh game, select pawn at C2 and move it to C3. Make any move on black side. Select pawn at C3 and attempt to move it to C6	The board displays and the pawn does not move three spaces	C3 is occupied by a pawn, C2 is empty. Pawn is not moved from C3 to C6
SE-F5-009	FR5	Check possible moves are displayed correctly for a pawn that is blocked on its first move and has no diagonal pieces to capture	Start a fresh game, select pawn at E2 and move it to E4. On black side select pawn at E7 and move it to E5. On white side select	The board and possible moves are displayed	Possible moves should show that the pawn can-not move anywhere

			bishop at F1 and move it to A6. On black side select pawn at A7		
SE-F5-010	FR5	Check that a pawn that is blocked on its first move and has no diagonal pieces to capture cannot move	Continue from last test, attempt to move pawn from A7 to A5	The board is displayed, and the piece cannot be moved	The piece should not be moved
SE-F5-011	FR5	Check possible moves are displayed correctly for a pawn that can capture an enemy piece	Continue from last test, Select the pawn on B7	The board and possible moves are displayed	Possible moves should show that the pawn can move to B6 or B5, or capture the piece at A6
SE-F5-012	FR5	Check the pawn can capture diagonally in front	Continue from last test, Move pawn from B7 to A6	The board and possible moves are displayed	Bishop at A6 is removed and the pawn at B7 is moved to A6
SE-F5-013	FR5	Check possible moves are displayed correctly for a pawn with an enemy piece diagonally behind it	Start a fresh game, Move white pawn from H2 to H4. Move black pawn from D7 to D6. Move white pawn from H4 to H5. Move black bishop from C8 to G4. Select white pawn	The board and possible moves are displayed	Possible moves should show that the pawn can move one place forward, and not show that it can capture the bishop behind it
SE-F5-014	FR5	Check the pawn cannot capture diagonally behind	Continue from last test, attempt to move the pawn from H5 to G4.	The board is displayed, and the pawn cannot capture behind it	Nothing should happen
Bishop Movement					
SE-F5-101	FR5	Check if the bishop displays the correct moves at the start of the game	Start a fresh game, select the bishop at C1.	The board and possible moves are displayed	Should not display any possible moves at all as the bishop is blocked
SE-F5-102	FR5	Check if the bishop can correctly display its available spaces which it can move to	Start a fresh game, select the pawn at B2 and move it to B3, after black's move select the bishop	The board and possible moves are displayed	Should display that it is able to move to B2 & C3
SE-F5-103	FR5	Check if the bishop can move one vacant square on its color	Start a fresh game, select the pawn at B2 and move it to B3, for black's turn move the pawn on G7 to G6, then for white move the bishop to B2	The board is displayed, and the bishop is moved	The bishop should Occupy the B2 square and the C1 square should be empty
SE-F5-104	FR5	Check if the bishop correctly displays its available moves on which it captures another piece	Continue from last test, for black's turn move the pawn on H7 to H5 then for	The board and possible moves are displayed	It should Display that it can Capture the Rook on H8

			white select the bishop		
SE-F5-105	FR5	Check if the bishop can move its full range on its own color	Continue from last test, after black's turn Move the Bishop from B2 to E5	The board is displayed, and the bishop is moved	The Bishop Should Occupy E5 and B2 should be empty
SE-F5-106	FR5	Check if the bishop correctly displays its available moves on which it captures other pieces	Continue from last test, after black's turn move the pawn on H5 to H4, then for black select the bishop	The board and possible moves are displayed	It should Display that it can Capture the Rook on H8 and the Pawn on C7
SE-F5-107	FR5	Check if the bishop is able capture, its own colors pieces	Continue from last test, Select the bishop, and try to Capture the white rook on A1	The board is displayed, and the bishop does not capture the piece	It should Not be able to capture the rook and no move should be executed and it should still be whites turn to move
SE-F5-108	FR5	Check if the bishop can capture opposing the opposing players pieces	Continue from last test, Select the bishop, and capture the pawn on C7	The board is displayed, and the bishop captures the piece	The Bishop Occupies the C7 Square and pawn is no longer on the board
Rook Movement					
SE-F5-201	FR5	Check possible moves are displayed correctly when the rook is blocked	Start a fresh game. Select rook at H1	The board and possible moves are displayed	Possible moves show that the rook cannot move anywhere
SE-F5-202	FR5	Check rook cannot move one place forward when blocked	Continue from last test, try to move rook	The board is displayed, and the rook cannot move	Rook cannot move
SE-F5-203	FR5	Check rook can move two places forward	Continue from last test, Move white pawn from H2 to H4. Move black pawn from G7 to G5. Move white rook from H1 to H3	The board is displayed, and the rook moves	Rook is moved from H1 to H3
SE-F5-204	FR5	Check possible moves are displayed correctly for rook with clear space in front and left	Continue from last test, Move black pawn from F7 to F6. Move white pawn from H4 to G5. Move black pawn from F6 to F5. Select white rook at H3	The board and possible moves are displayed	Possible moves are displayed that show the rook can move anywhere on the board directly to the left. And can move up to 3 spaces directly forward or take the pawn at H7
SE-F5-205	FR5	Check rook can move four places forward	Continue from last test, Move rook from H3 to H6	The board is displayed, and the rook moves	Rook is moved to H6
SE-F5-206	FR5	Check rook can move one place left	Continue from last test, Move black pawn from E7 to E5. Move rook from H6 to G6	The board is displayed, and the rook moves	Rook is moved to G6

SE-F5-207	FR5	Check rook can move seven places left	Continue from last test, Move black pawn from E5 to E4. Move white rook from G6 to A6	The board is displayed, and the rook moves	Rook is moved to A6
SE-F5-208	FR5	Check possible moves are displayed correctly for rook that can move backwards and right	Continue from last test, Move black pawn from F5 to F4. Select white rook at A6	The board and possible moves are displayed	Possible moves display that indicate rook can be moved up to 3 places directly backwards, or up to 7 places directly right.
SE-F5-209	FR5	Check rook can move three places backwards	Continue from last test, Move white rook from A6 to A3	The board is displayed, and the rook moves	Rook is moved to A3
SE-F5-210	FR5	Check rook can move one place right	Continue from last test, Move black pawn from F4 to F3. Move white rook from A3 to B3	The board is displayed, and the rook moves	Rook is moved to B3
SE-F5-211	FR5	Check possible moves are displayed correctly for a rook that can capture a piece to the right	Continue from last test, Move black pawn from H7 to H6. Select white rook at B3	The board and possible moves are displayed	Possible moves are displayed that the rook can move up to 3 places directly right, or capture pawn at F3
SE-F5-212	FR5	Check rook can capture a piece 4 places directly right	Continue from last test, Move white rook at B3 to F3	The board is displayed, and the rook captures the piece	The rook is moved to F3 and the pawn previously at F3 is removed from play
Knight Movement					
SE-F5-301	FR5	Check the knight displays the correct moves at the start of the game	Start a fresh game, Select the knight at G1.	The board and possible moves are displayed	The knight should have possible moves on F3 and H3
SE-F5-302	FR5	Check that the Knight can move to a space	Continue from last test, Move the King's side Knight to C3	The board is displayed and the knight moves	The Knight should now be at C3 and B1 should be Empty
SE-F5-303	FR5	Check that the Knight cannot take a Friendly piece	Continue from Last Test, Move Black's D pawn to D5 now try to move the Knight on C3 to Take the E2 Pawn	The board is displayed, and the knight cannot capture the piece	The Knight Should not be Able to take the E4 pawn as it is a friendly piece
SE-F5-304	FR5	Check that the knight Correctly displays that it can capture pieces	Continue from last test, Select the Knight on C3	The board and possible moves are displayed	It should display that that the Knight Can capture the Pawn on D5
SE-F5-305	FR5	Check That the knight can Capture pieces	Continue From last test, Select the Knight on C3 and Capture the pawn on D5	The board is displayed, and the knight captures the piece	The Knight will Capture the Pawn and will be on D5

SE-F5-306	FR5	Check that the Knight can display all of its moves correctly	Continue from last test, do move the Black pawn on E7 to E6 now select the Knight	The board and possible moves are displayed	The knight Should Display Available moves on E7 & E3, F6 & F4, C7 & C3, and B4 & B6
SE-F5-307	FR5	Check that the Knight Can be captured by another piece	Continue from last test, move your pawn on E2 to E4 then as Black take the Knight with Your pawn on E6	The board is displayed, and the knight is captured	On E5 there should be a Black pawn and no White Knight on the Tally for the Black Player the Count should be at 1 Knight Captured
Queen Movement					
SE-F5-401	FR5	Check the Queen displays the correct moves at the start of the game	Start a fresh game, select the Queen at D1.	The board and possible moves are displayed	The Queen should have no possible moves as it is blocked
SE-F5-402	FR5	Check that the Queen can't move anywhere when blocked in	Continue from Last test, try to move the Queen to D2, E1, and C1.	The board is displayed, and the queen does not move	The Queen should not have moved as all of them are illegal moves
SE-F5-403	FR5	Check that the Queen can correctly display All the available moves	Continue from Last test, move White's pawn from E2 to E4 for Black Move the E7 pawn to E5 now select the queen at D1	The board and possible moves are displayed	The only Available correct moves should be the diagonal that goes from D1 to H5
SE-F5-404	FR5	Check that the Queen can Correctly move one space Diagonally	Continue from last test, Select the Queen and move her to E2	The board is displayed, and the queen moves	The D1 square should be empty, and the Queen should now be on the E2 square
SE-F5-405	FR5	Check that the Queen can Correctly move One space vertically	Continue from the last test, for Black move the pawn at F7 to F6 then move the queen at E2 to E3	The board is displayed, and the queen moves	The E2 square should be empty and the E3 square should house the Queen
SE-F5-406	FR5	Check that the Queen can Correctly move one space horizontally	Continue from last test, move the black pawn at F6 to F5. Move the white queen at E3 to D3	The board is displayed, and the queen moves	The E3 square should be Empty and the D3 square should house the Queen
SE-F5-407	FR5	Check that the Queen can Correctly Display available Captures	Continue from last test, for black Capture the E4 pawn with Your F5 pawn then as White select the Queen at D3	The board and possible moves are displayed	The Queen Displays that it can capture the Pawns on E4 and D7
SE-F5-408	FR5	Check that the Queen can capture diagonally adjacent	Continue from Last test, Capture the Pawn on E4 with the queen on D3. For Black move the Queen diagonally adjacent to E7	The board is displayed, and the queen captures the piece	The White Queen is now on the E4 Square and the Black Pawn is gone, and the Black Queen is on the E7 Square

SE-F5-409	FR5	Check that the queen can capture vertically adjacent	Continue from last test, Capture the Pawn on E5 with the white queen at E4.	The board is displayed, and the queen captures the piece	The White Queen is now on the E5 Square and the Black Pawn is gone
SE-F5-410	FR5	Check that the queen can capture vertically 2 spaces and is able to be captured	Continue from last test, Capture the white queen on E5 with the Black Queen on E7.	The board is displayed, and the queen captures the piece	The Black Queen is where the White Queen was and E7 is now empty.
SE-F5-411	FR5	Check that The Queen can Capture Diagonally	Continue from Last Test, move white bishop from F1 to E2. For black capture the white pawn at B2 with the queen at E5.	The board is displayed, and the queen captures the piece	The Black queen is now on B2, and the Pawn is captured
SE-F5-412	FR5	Check That the Queen can be captured by another Piece other than a Queen	Continue from last test, select the white bishop at C1 and take the black queen at B2 with it.	The board is displayed, and the queen is captured	The bishop is Now on B2, and the Black Queen is Captured
King Movement					
SE-F5-501	FR5	Check that the King displays the correct moves at the start of the game	Start a fresh game, select the white king at E1	The board and possible moves are displayed	The king should not have any possible moves as it is blocked
SE-F5-502	FR5	Check that the King Can't Move when it is blocked in	Continue from last test, try to move the king at E1 to: F1, F2, E2, D1, and D2	The board is displayed, and the king is not moved	The King Should Not move to Any space and remain where it is
SE-F5-503	FR5	Check that the King can correctly display All the available moves	Continue from the Last test, move White's pawn from E2 to E4 for Black Move the E7 pawn to E5 now select the king	The board and possible moves are displayed	The Only move That Should show is King to E2
SE-F5-504	FR5	Check that the King can move	Continue from last test, Select the White king and move him to E2 than for Black's King move him to E7	The board is displayed, and the king is moved	The kings should move from the starting Square to Now E2 for the White king and E7 for the Black King
SE-F5-505	FR5	Check that the King can move diagonally	Continue from last test, Move the White king to D3 than for the Black king Move to F6, Move the White King to C4 than for the Black King Move to G5	The board is displayed, and the king is moved	The kings should have moved from E2 and E7 to C4 and G4
SE-F5-506	FR5	Check that the White King correctly displays all possible moves	Continue From Last test, Select the White King	The board and possible moves are displayed	Since the King cannot move into the way of incoming enemy

					pieces as you cannot voluntarily move into check the king Should display that the Only possible moves are B5, B3, C3, D3, & D5
SE-F5-507	FR5	Check that the Black king correctly displays all possible moves	Continue the last test, move the White bishop to E2 than Select the Black King	The board and possible moves are displayed	Since the King cannot move into the way of incoming enemy pieces as you cannot voluntarily move into check the king Should display that the Only possible moves are F4, F6, G6, H6, & H4
SE-F5-508	FR5	Check that the king correctly displays that it can Capture a Piece	Continue from the Last test, For Black move the Bishop to C5 than Select the White king	The board and possible moves are displayed	The White King should be Displayed to be able to capture the Bishop on C5
SE-F5-509	FR5	Check that the king can correctly capture a piece	Continue from the last test, Select the White king and capture the bishop on C5	The board is displayed, and the king captures the piece	The White King should now be on C5, and the bishop should now be Captured
SE-F5-510	FR5	Check that the king should not be able to move into check	Continue from last test, Select the black king, and try to move to F5	The board is displayed, and the king is not moved	The Black king should not be able to move to F5 as that Space is controlled by the white Pawn on E4
Special Movement					
En-Passant Tests					
SE-F5-601	FR5	Check that En-Passant is displayed when it is possible	Start a fresh game, move white's E pawn to E4, then Move Black's E pawn to E6, then move the E4 pawn to E5, then move blacks d pawn to D5, now select the E5 pawn	The board and possible moves including En-Passant are displayed	En-Passant should be displayed as a possible move on this turn for the pawn to take on the D6 square
SE-F5-602	FR5	Check that En-Passant is not displayed on the next turn when it is not taken on its turn	Continue from last test, move any piece as white and the same for black and then as white select the E5 pawn	The board is displayed and does not show En-Passant as possible	En-Passant should not be displayed as a possible move on this turn.
SE-F5-603	FR5	Check that En-Passant is correctly executed in the chess game	Start a fresh game, move white's E pawn to E4, then Move Black's E pawn to E6, then move the E4 pawn to E5, then move blacks d pawn	D5 and E5 become vacant and D6 is occupied by white pawn indicating that En-Passant has happened	The D5 and E5 Square should be vacant the White pawn should be on D6

			to D5, now select the E5 pawn and execute En-Passant on D6		
SE-F5-604	FR5	Check that En-Passant is not able to be executed on the next turn then it was able to be done	Start a fresh game, move white's E pawn to E4, then Move Black's E pawn to E6, then move the E4 pawn to E5, then move black's d pawn to D5, do any other move for white then En-passant, do any other move for black other than moving the D5 pawn, now select the E5 pawn and try to execute En-Passant on D6	En-Passant cannot happen	En-Passant should no longer be possible and as such nothing should happen
SE-F5-605	FR5	Check that En-Passant is not able to be executed on the next turn then it was able to be done after the pawn has moved	Start a fresh game, move white's E pawn to E4, then Move Black's E pawn to E6, then move the E4 pawn to E5, then move black's d pawn to D5, do any other move for white then En-passant, for black move the D5 pawn forward, now select the E5 pawn and try to execute En-Passant on D6	En-Passant cannot happen	En-Passant should no longer be possible and as such nothing should happen
SE-F5-606	FR5	Check that En-Passant is not able to be executed on any turn after it was able to be done.	Start a fresh game, move white's E pawn to E4, then Move Black's E pawn to E6, then move the E4 pawn to E5, then move black's d pawn to D5, do any other move for white then En-passant for 5 turns same with black, then try to execute En-passant	En-Passant cannot happen	En-Passant should no longer be possible and as such nothing should happen
SE-F5-607	FR5	Check that En-Passant is not able to be seen or executed on any other piece other than a pawn	Start a fresh game, move white's E pawn to E4, then Move Black's D pawn to D6, move white's pawn to E5 then move black's bishop to F5, Now	The bishop is not captured by the pawn	Since Pawns are the only pieces that can be attacked via En-Passant nothing should be displayed and the bishop should not be able to be captured by the pawn

			select the E5 pawn and try to execute En-Passant on the Bishop		
Promotion Tests					
SE-F5-701	FR5	Check that the Promotion menu is displayed when it should be for white	Start a fresh game, The moves are: white: pawn to e4 Black: pawn to d5 white: pawn to d3 Black: pawn to c6 white: pawn captures on d5 from e4 black: pawn to e6 white: pawn captures on c6 from d5 black: pawn to e5 white: cxb7 pawn captures on B7 from c6 black: Knight to C6 white: pawn to b8	The promotion menu is opened with the black color pieces	The Promotion menu should open with 4 options for the player to choose From Knight, Queen, Bishop, and Rook in White's Color
SE-F5-702	FR5	Check that the Promotion menu is displayed when it should be for black	Start a fresh game, The moves are: white: pawn to d4 Black: pawn to e5 white: pawn to c3 Black: pawn captures on d4 from e5 white: pawn to e3 black: pawn captures on c3 from d4 white: pawn to e4 black: pawn captures on b2 from c3 white: Knight to C3 black: pawn to b1	The promotion menu is opened with the black color pieces	The Promotion menu should open with 4 options for the player to choose From Knight, Queen, Bishop, and Rook in Black's Color
SE-F5-703	FR5	Check That the Promotion to a Bishop is possible	Start a fresh game, The moves are: white: pawn to e4 Black: pawn to d5 white: pawn to d3 Black: pawn to c6 white: pawn captures on d5 from e4 black: pawn to e6 white: pawn captures on c6 from d5	B8 becomes a bishop. A message that black has taken a pawn is displayed	The Pawn on B8 should now be a Bishop on Dark squares and it should display that Black has Taken One Of your Pawns

			black: pawn to e5 white: pawn captures on b7 from c6 black: Knight to C6 white: pawn to b8 and select to Promote to a Bishop		
SE-F5-704	FR5	Check that the Promotion to a Knight is possible	Start a fresh game, The moves are: white: pawn to e4 Black: pawn to d5 white: pawn to d3 Black: pawn to c6 white: pawn captures on d5 from e4 black: pawn to e6 white: pawn captures on c6 from d5 black: pawn to e5 white: pawn captures on b7 from c6 black: Knight to C6 white: pawn to b8 and select to Promote to a Knight	B8 becomes a knight. A message that black has taken a pawn is displayed	The Pawn on B8 should now be a Knight and it should display that Black has Taken One Of your Pawns
SE-F5-705	FR5	Check that the Promotion to a Rook is possible	Start a fresh game, The moves are: white: pawn to e4 Black: pawn to d5 white: pawn to d3 Black: pawn to c6 white: pawn captures on d5 from e4 black: pawn to e6 white: pawn captures on c6 from d5 black: pawn to e5 white: pawn captures on b7 from c6 black: Knight to C6 white: pawn to b8 and select to Promote to a rook	B8 becomes a rook. A message that black has taken a pawn is displayed	The Pawn on B8 should now be a Rook and it should display that Black has Taken One Of your Pawns
SE-F5-706	FR5	Check that the Promotion to a Queen is possible	Start a fresh game, The moves are: white: pawn to e4 Black: pawn to d5 white: pawn to d3 Black: pawn to c6	B8 becomes a queen. A message that black has taken a pawn is displayed	The Pawn on B8 should now be a Queen and it should display that Black has Taken One Of your Pawns

			white: pawn captures on d5 from e4 black: pawn to e6 white: pawn captures on c6 from d5 black: pawn to e5 white: pawn captures on b7 from c6 black: Knight to C6 white: pawn to b8 and select to Promote to a Queen		
SE-F5-707	FR5	Check that a Promotion is possible right after a capture	Start a fresh game, The moves are white: pawn to d4 Black: pawn to e5 white: pawn to c3 Black: pawn captures on d4 from e5 white: pawn to e3 black: pawn captures on c3 form d4 white: pawn to e4 black: pawn captures on b2 from c3 white: Knight to C3 black: pawn captures on a1 from b2 and try to promote to a queen	The promotion menu is opened next to the black player's name. When queen is chosen, a message is displayed saying that white has taken a black pawn	The Promotion menu should open next to the Name of the Black Player with 4 options for the player to choose From Knight, Queen, Bishop, and Rook. Then when the Queen is Chosen It Should Say that White Has taken a Black Pawn
SE-F5-708	FR5	Check that Promotions are not possible with other pieces	Take Every other piece of white's to the 8 th row meaning a bishop, rook, queen, and king	The promotion menu does not open	The promotion menu Should Not open since only pawns can promote
Castling Tests					
SE-F5-801	FR5	Check that Castling is possible on the king's side	Start a fresh game, The moves are white: pawn to e4 Black: pawn to e5 white: Bishop to D3 Black: pawn to f6 White: Knight to f3 Black: Bishop to c5. Now select the White King	Possible moves show that castling is possible on the king's side	It should Display That Castling is Possible on the King's side by Showing a Golden king on G1 and a Rook on F1
SE-F5-802	FR5	Check That Castling is possible on the Queen's side	Continue from Last Test, the moves are: White: Queen to e2	Possible moves show that castling	It Should Display that Castling is possible bon the Queen's side

			Black: Bishop to d6 White: pawn to b3 Black: Bishop to a3 White: Bishop on c1 captures Bishop on a3 Black: pawn to f5 White: Knight to c3 Black: pawn captures on e4 from f5 now Select The White King	is possible on the queen's side	by showing A Golden King on C1 and a golden rook on D1
SE-F5-803	FR5	Check That Castling on the King's side works	Continue From Last test, Select the white king and castle on the King's side	The board shows that G1 is occupied by the king and F1 is occupied by a rook	The King is now on the G1 Square and the Rook is on the F1 square
SE-F5-804	FR5	Check That Castling on the Queen's side works	Continue From SE-F5-802, Select the king and castle on the Queen's side	The board shows that C1 is occupied by the king and D1 is occupied by a rook	The King is now on the C1 Square and the Rook is on the D1 square
SE-F5-805	FR5	Check That Castling is disabled when the king is moved	Continue From SE-F5-802, Select the king and move to F1 then move Black's D pawn to D6 now select the King	Castling is not possible	The king has moved so castling is no longer Available for White
SE-F5-806	FR5	Check That Castling on the king's side is disabled when the rook has moved	Continue From SE-F5-802, Select the Rook and move to F1 then move Black's D pawn to D6 now select the King	Castling is not possible	Castling is no longer available on the king's side
SE-F5-807	FR5	Check That Castling on the Queen's side is disabled when the rook has moved	Continue From SE-F5-802, Select the Rook and move to C1 then move Black's D pawn to D6 now select the King	Castling is not possible	Castling is no longer available on the Queen's side
SE-F5-808	FR5	Check That Castling is disabled when there are places the enemy pieces can be on the next turn in between the king and the rook	Continue From SE-F5-802, Select the Knight on C3 and move to D5 then take Black's E pawn on F3 do any move as white except move the Queen, king, or any Rooks, Now Take the Queen on E2 with the F3 Pawn and Select the White King	Castling is not possible	Castling is no longer available as the pawn is blocking the Path between both Rooks and the King
FR6 – Detecting Check					

SE-F6-001	FR6	Check That the king does not start off being in check	Start a new game	The board is displayed, and no kings are in check	At the Start of the Games none of the Kings should be in Check
SE-F6-002	FR6	Check That putting the King in Check is Possible	Start a new game, Push white's D pawn to D4 then push black's E pawn to E6 then push white's E pawn to E3. Then Move Black's Bishop to B4	The board is displayed, and the king's square is highlighted yellow	This Should put the king in check and highlight a yellow square underneath him.
SE-F6-003	FR6	Check that moving another piece unrelated to Blocking/ taking the enemy piece giving check to the king should not be possible.	Continue From Last test, try to move the D4 pawn to D5	The board is displayed, and the piece cannot be moved	Since the King is in check and that piece/ move Neither blocks nor takes the piece giving check it is not possible to be done
SE-F6-004	FR6	Check That all Available Moves when given check are displayed	Continue from last test, there should be Displayed for this specific Check 6 Available moves	The board is displayed, and the possible moves are shown	The only available moves are as follows Move the King to E2, Move the Queen to D2, move the Bishop to D2, move the Pawn to C3, and move the Knight to B3 and D2
SE-F6-005	FR6	Check that it is possible to get out of the Check state	Continue from last test, Move the pawn from C2 to C3	The board is displayed, and the king's square is no longer highlighted yellow	The King Should no longer be in check
SE-F6-006	FR6	Check that it is not possible for you to move a piece which would then result in a check being given on your own king	Continue from last test, Move the Bishop from B4 to A5 and now try to push White's C pawn forward	The board is displayed, and the piece is not moved	Since the Rules of chess do not allow for the person to check themselves after moving one of their pieces The pawn on C3 cannot be Moved as it is pinned on to the King
SE-F6-007	FR6	Check that it is not possible to escape check via Castling	Continue from last test do any moves for black except moving the Bishop while for white moving the bishop to D3 and Knight to F3, after which take with black's bishop on C3 checking the king and then try to castle	The board is displayed, and the piece is not moved	Since the King is in Check, he cannot castle
SE-F6-008	FR6	Check if it is possible to capture a piece to escape check	Continue from last test, Capture the	The board is displayed, and the king's square is no	The king should no longer be in check as

			Bishop on C3 with White's Knight on B1	longer highlighted yellow	the bishop has now been Captured
FR7 – Detecting Checkmate					
SE-F7-001	FR7	Check to see if Checkmate is Detected successfully for Black	Start a new Game, the moves are: White: F3 Black: E6 White: G4 Black: Queen H4	The game is ended and the black side wins	The Game should end and the square under the king should be red. The name of the Black player should be displayed saying 'Player Name' Wins as well as the end game prompt. This is Checkmate Because the King cannot go anywhere, and No Pieces can Block and or capture the Queen giving Check
SE-F7-002	FR7	Check to see if Checkmate is Detected successfully for White	Start a new Game, the moves are: White: E4 Black: E5 White: Queen to F3 Black: Knight to E7 White: Bishop to C4 Black: Queen's Knight to C6 White: Queen to F7	The game is ended and the white side wins	The Game should end and the square under the king should be red. The name of the White player should be displayed saying 'Player Name' Wins as well as the end game prompt. This is Checkmate Because the King cannot go anywhere, and No Pieces can Block and or capture the Queen giving Check. Especially not the King as Capturing the Queen would not be possible as it is being Protected by the bishop
SE-F7-003	FR7	Check to see if user can perform a Fool's checkmate	Start a new game; White: F3 Black: Knight to A3 White: G4 Black: Queen to H4	The game is ended and black side wins	The Game should end and the square under the white king turning red. The victor's name is shown on screen
SE-F7-004	FR7	Check to see if user can perform Scholar's checkmate	Start a new game; White: E4 Black: E5 White: Bishop to C4 Black: Knight to C6 White: Queen to H5 Black: Knight to F6 White: Queen to F7	The game is ended and white side wins	The game should end and the square under the black king turning red, the victor's name is shown on screen.
SE-F7-005	FR7	Check to see if user can perform a Double checkmate	Start a new game; White: D4 Black: Knight to C6 White: B3 Black: Knight to	The game is ended and black side wins	The game should end with the square under the white king turning red.

			B4 White: F3 Black: C6 White: Bishop to H3 Black: Queen to A5 White: G3 Black: Knight to d3.		
FR8 – End of game					
SE-F8-001	FR8	Check a prompt is displayed when the game ends	Start a new game, end it	The game ends and a prompt is displayed	An Endgame prompt should appear Saying which player won having an option to save the replay and quit to the Menu
SE-F8-002	FR8	Check white can offer a draw	Start a new game. Offer a draw as white	Black Is prompted to either accept or decline the draw	Black Is prompted to either accept or decline the draw
SE-F8-003	FR8	Check black can offer a draw	Start a new game. Move white pawn from C2 to C3. Offer a draw as black	White is prompted to either accept or decline the draw	White is prompted to either accept or decline the draw
SE-F8-004	FR8	Check accepting a draw works properly	Continue from last test. Accept the draw as white	The game is ended	The game is ended, and a popup prompt is displayed detailing the results
SE-F8-005	FR8	Check returning to the menu from a draw works properly	Continue from last test. Press returns to menu button	Users are returned to the menu	The users are returned to the main menu
SE-F8-006	FR8	Check declining a draw works properly	Start a new game. Click the draw button as white. Click the decline draw button	The game continues	The game continues
SE-F8-007	FR8	Check resign button works for white	Start a new game. Click the resign button as white	Black wins	The game ends with black winning. A popup prompt is displayed detailing the results
SE-F8-008	FR8	Check resign button works for black	Start a new game. Make any move for white. Click the resign button as black	White wins	The game ends with white winning. A popup prompt is displayed detailing the results
SE-F8-009	FR8	Check returning to the main menu from a resignation works properly	Continue from last test. Press returns to menu button	The users are returned to the main menu	The users are returned from the main menu
FR9 – Quitting the game					
SE-F9-001	FR9	Check that Clicking the Quit button gives you a prompt	Click on the Quit Button as either Player	A prompt is displayed	A prompt should come up saying "Are you sure you would like to quit"
SE-F9-002	FR9	Check that Clicking "No" returns you to the game in the same players turn	Continue from last test, Click No	The board is displayed	The game should return to the board at the same player's turn

SE-F9-003	FR9	Check that Clicking “Yes” returns the users to the main menu	Continue from SE-F9-001, Click Yes	The main menu is displayed	The game should return to the Main menu
FR10 – Replay Game					
SE-F10-001	FR10	Check that the jump to next move button works	Open a previous game. Press jumps to next move	Next move is displayed	Next move is displayed
SE-F10-002	FR10	Check that when the end of the game has been reached the user cannot ‘jump to the next move’	Continue from previous test. Keep jumping to next move until the last move has been played. Try to press jump to next move	The end of the game is reached	The end of the game is reached, and nothing happens after the button is pressed again
SE-F10-003	FR10	Check that jump to previous move button works	Continue from previous test. Press jumps to previous move	The previous move is displayed	The previous move is displayed
SE-F10-004	FR10	Check that at the start of the game the jump to previous move button does not work	Continue from previous test. Press jump to previous move until the starting board is displayed. Try pressing jump to previous move again	The starting board is displayed	The starting board is displayed, and nothing happens after pressing the button again
SE-F10-005	FR10	Check that the quit button in the replay works	Continue from last test. Press the quit button	The main menu is displayed	The main menu is displayed
FR11 – Storing and restoring the game state					
SE-F11-001	FR11	Check when ‘replay game’ is selected A file explorer window appears	Navigate to the main menu. Press ‘replay game’ button	A file explorer window is displayed	A file explorer window is displayed
SE-F11-002	FR11	Check that the user is able to navigate through folders using the explorer window by double clicking a folder	Continue from last test, navigate into a folder by double clicking it	File explorer window shows folder that was navigated to	File explorer window shows the folder that was double clicked
SE-F11-003	FR11	Check that the user is able to navigate up (to the parent file) using the explorer window	Continue from last test. Press the navigate to parent button	File explorer window shows parent folder	File explorer window displays the parent folder
SE-F11-004	FR11	Check that directories that do not contain a saved game cannot be selected by the application	Try to select a directory that is not a game directory	The file is not selected, and the file explorer window remains open	The file is not selected, and the file explorer window remains open
SE-F11-005	FR11	Check that invalid XML files are detected and not loaded by the application	A directory has been made containing game save files and other XML files called ‘SE-F11-005_Test’. Try to select this file	The file is not selected, and the file explorer window remains open	The file is not selected, and the file explorer window remains open

SE-F11-006	FR11	Check that corrupted save files are detected and not loaded by the application	A directory has been made containing a save file which has been opened and had some XML files corrupted by adding and removing data at random places, called 'SE-F11-006_Test'. Try to select this file	The file is not selected, and the file explorer window remains open	The file is not selected, and the file explorer window remains open
SE-F11-007	FR11	Check that a valid replay file is loaded	A valid replay file has been made called 'SE-F11-007_Test'	The replay screen open	A screen is displayed showing the starting board, with the option to jump to the next move
SE-F11-008	FR11	Check that the names are loaded correctly from a save file	Continue from last test	The board is displayed with the names displayed by the correct colors	The correct names are displayed by the colors
SE-F11-009	FR11	Check that a valid ongoing game is loaded	A valid ongoing game file has been made called 'SE-F11-007_Test'. Select this file	The game is loaded with the correct names and board layout	The game is loaded with the correct names and board layout
SE-F11-010	F11	Check that pressing save in an ongoing game opens a file browser	Create a new game. Call the white player 'player_white' and the black player 'player_black'. Press the save button.	A file browser opens	A file browser opens
SE-F11-011	FR11	Check that saving an ongoing game works correctly	Continue from last test. Create a folder and save the game under it	An XML file called '1.xml' is saved under the save folder	An XML file called '1.xml' is saved under the save folder. Load this save file. The board should display with pieces in the starting position, the white player should be called 'player_white', and the black player is called 'player_black'
SE-F11-012	FR11	Check that at the end of a round the ongoing game saves automatically	Continue from last test. Move the white pawn from F2 to F3.	At the end of the turn an XML file called '2.xml' is saved under the save folder	At the end of the turn An XML file called '2.xml' is saved under the save folder. Load this save file. The board should display with pieces in the starting position, except for F3 contains a white pawn at F2 is empty. The white

					player should be called 'player_white', and the black player is called 'player_black'
SE-F11-013	FR11	Check that saving a game replay opens a file browser	Start a new game. Move white pawn from G2 to G3. Move black pawn from C7 to C6. Move white pawn from H2 to H3. Offer a draw and accept it. When prompted press 'Save Replay'	A file browser is opened	A file browser is opened
SE-F11-014	FR11	Check that saving a game replay works properly	Continue from last test. Select a location to save the file and save it	The save file contains 3 files: '1.xml', '2.xml', and '3.xml'	The save file contains 3 files: '1.xml', '2.xml', and '3.xml'. These files contain the contents of each turn

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- [2] Software Engineering GP02 Project: User Interface Specification. T. Roethenbaugh. Et al. SE.GP02.UISpec. 1.1.0 Release
- [3] Software Engineering GP02 Project: UI Specification Prototype Presentation. J. Book. Et al. SE.GP02.UIPres. 1.0 Release

DOCUMENT HISTORY

Version	Issue No.	Date	Changes made to document	Changed by
0.1	N/A	05/02/2023	N/A - original version	MIB60
0.2	N/A	12/02/2023	Added more tests, added headers for each functional requirement and sub-headers for FR5	MIB60
0.2.5	N/A	13/02/2023	Removed Some Tests that were no Longer Required, Added Tests for the Bishop, Changed Test Ref names to make it more readable	ABD15
0.3	N/A	15/02/2023	Added more tests for pawn movement and tests for rook movement, removed a redundant test from FR1	MIB60
0.3.5	N/A	20/02/2023	Completed the Table headers, Added Basic tests for remaining untested pieces and tests for En-Passant	ABD15
0.4	N/A	21/02/2023	Finished rook and bishop movement tests. Fixed some FR3 tests. Added FR10 tests. Added list of use case tests that need to be added	MIB60
0.5	N/A	23/02/2023	Added FR9, FR10, FR11 tests	MIB60
0.5.5	N/A	23/02/2023	Added a few more tests, fixed version history decimal points	MIB60
0.6	N/A	27/02/2023	Added a lot of tests, only 3 Sections left, Fixed version Number on Title Page	ABD15
0.6.5	N/A	01/03/2023	Marked Document for Review	ABD15
0.7	N/A	02/03/2023	Changed document version, removed incorrect section, changed date, changed copyright date, added author spacing, updated contents page, added output for tests up to and including knight movement	MIB60
0.7.5	N/A	05/03/2023	Finished adding outputs for the tests	MIB60
0.8	N/A	05/03/2023	Went over the document fixed minor grammar and spelling mistakes leftover, made the Castling and Promotion tests more readable, added references, and marked the Test Specification for review again	ABD15
1.0	N/A	07/03/2023	Review passed, marked document as Release	ABD15
1.1	N/A	16/03/2023	Added more explicit data, created some valid and invalid save files for FR11 testing. Added more FR11 tests	MIB60
1.1.5	N/A	16/03/2023	Added Save File Testing section and updated table	MIB60
1.2	N/A	16/03/2023	Added NFR table and NFR tests	MIB60
1.2.1	N/A	01/05/2023	Removed some full stops at the end of sentences and added the Document to docs	ABD15
1.3	N/A	02/05/2023	Added more tests to Detecting Checkmate	LVS1
1.4	N/A	03/05/2023	Fixed the readability of the promotion tests	ABD15