Software Engineering GP02 Project

Testing Specification

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# Introduction

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

## 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.

## Scope

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

## 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.

## 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.

# 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 |

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| --- | --- | --- | --- | --- | --- | --- |
| **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 to E3. Move black pawn from E5 to D4 | 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 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 bishop at F1 and move it to A6. On black side select pawn at A7 | The board and possible moves are displayed | | Possible moves should show that the pawn can-not move anywhere |
| 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 than for white select the bishop | The board and possible moves are displayed | | It should Display that it can Capture the Rook on H8 |
| 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 to D5, now select the E5 pawn and execute En-Passant on D6 | 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 |
| 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 blacks d pawn to D5, do any other move for white then En-passant, do any other move for black other then 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 blacks 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 blacks 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 whites pawn to E5 then move black’s bishop to F5, Now select the E5 pawn and try to execute En-Passant on the Bishop | 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 |
| **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: e4 Black: d5 white: d3 Black:c6 white: exd5 black: e6 white: dxc6 black: e5 white: cxb7 black: Knight to C6 white:b8 | The promotion menu is opened next to the white player’s name | | The Promotion menu should open next to the Name of the White Player 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: d4 Black: e5 white: c3 Black:exd4 white: e3 black: dxc3 white: e4 black: cxb2 white: Knight to C3 black: b1 | The promotion menu is opened next to the black player’s name | | 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 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: e4 Black: d5 white: d3 Black: c6 white: exd5 black: e6 white: dxc6 black: e5 white: cxb7 black: Knight to C6 white: b8 and select to Promote to a Bishop | 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 |
| SE-F5-704 | FR5 | Check that the Promotion to a Knight is possible | Start a fresh game, The moves are: white: e4, black: d5 white: d3, black: c6 white: exd5 black: e6 white: dxc6 black: e5 white: cxb7 black: Knight to C6 white: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: e4 Black: d5 white: d3 Black: c6 white: exd5 black: e6 white: dxc6 black: e5 white: cxb7 black: Knight to C6 white: 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: e4 Black: d5 white: d3 Black: c6 white: exd5 black: e6 white: dxc6 black: e5 white: cxb7 black: Knight to C6 white:b8 and select to Promote to a Queen | 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 |
| SE-F5-707 | FR5 | Check that a Promotion is possible right after a capture | Start a fresh game, The moves are white: d4 Black: e5 white: c3 Black: exd4 white: e3 black: dxc3 white: e4 black: cxb2 white: Knight to C3 black: bxa1 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 8th row | 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: e4 Black: e5 white: Bishop D3 Black: F6 White: Knight C3 Black: Bishop 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 E2 Black: Bishop D6 White: B3 Black: Bishop A3 White: Bishop captures Bishop Black: F5 White: Knight C3 Black: FxE4 Now Select The White King | Possible moves show that castling is possible on the queen’s side | | It Should Display that Castling is possible bon 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-F5-807 | 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 Bishop on C3 with White’s Knight on B1 | The board is displayed, and the king’s square is no longer highlighted yellow | | The king should no longer be in check as 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 |
| **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 | FR11 | 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. |

REFERENCES

[1] Software Engineering Group Projects: General Documentation Standards. C.W. Loftus. SE.QA.03. 2.5 Release

[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 |