Software Engineering GP02 Project

Testing Specification

|  |  |
| --- | --- |
| Author: | Micah Barendse [mib60], Abdullah Durrani [abd15] |
| Config Ref: | SE\_N66\_xxx\_xx |
| Date: | 7th February 2023 |
| Version: | 0.35 |
| Status: | Draft |

Department of Computer Science

Aberystwyth University

Aberystwyth

Ceredigion

SY23 3DB

Copyright © Aberystwyth University 2021

CONTENTS

CONTENTS 2

1. Introduction 3

1.1 Purpose of this Document 3

1.2 Scope 3

1.3 Objectives 3

2. USE CASE TESTING 3

3. TEST SPECIFICATIONS 3

REFERENCES 7

DOCUMENT HISTORY 8

# 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.

# USE CASE TESTs that need to be added

This section will be removed prior to review

* Need some more tests and error cases for saving games
* Need some more tests and error cases for loading games
* Prompt castling move
* Check
* Checkmate
* Back button
* Offer draw
* Resign button
* Prompt en passant
* Toggle hints button
* End game

# TEST SPECIFICATIONS

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 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 user names, 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 user name 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 | ***TBD based on future design*** | 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 colour | | 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 | None | 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 | None | ***TBD based on future design*** |
| 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. | None | ***TBD based on future design*** |
| **FR4 – Piece Selection** | | | | | | |
| SE-F4-001 | FR4 | Check that selecting an empty space does nothing | | Start a fresh game. Try to select some empty spaces | None | ***TBD based on future design*** |
| SE-F4-002 | FR4 | Check that during white turn white pieces can be selected | | Select any white piece during white’s turn | None | The piece will be selected and the program will display hints |
| SE-F4-003 | FR4 | Check that during white turn black pieces cannot be selected and moved | | Try to select any black piece during white’s turn | None | The piece should not be selected |
| SE-F4-004 | FR4 | Check that during black turn black pieces can be selected | | Select any black piece during black’s turn | None | The piece will be selected and the program will display hints |
| SE-F4-005 |  | Check that during black turn white pieces cannot be selected and moved | | Try to select any white piece during black’s turn | None | 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 | | On white’s turn: select any white piece, then, without moving it, select another white piece | None | The program displays hints for the first piece, then when the second piece is clicked the hints disappear, and hints for the second piece 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 | | On black’s turn: Select any black piece, then, without moving it, select another black piece | None | The program displays hints for the first piece, then when the second piece is clicked the hints disappear, and hints for the second piece are displayed |
| **FR5 - Movement** | | | | | | |
| **Pawn Movement** | | | | | | |
| SE-F5-001 | FR5 | Check the pawn displays correct hints on its first move | | Start a fresh game. Select pawn at C2 | None | Display hints 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 | None | 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 | None | C4 is occupied by a pawn, C2 is empty |
| SE-F5-004 | FR5 | Check the pawn displays correct hints on its second move | | Start a fresh game. Move pawn from C2 to C3. Make any move on black side. Select pawn at C3. | None | Pawn is moved to C3. When clicked again display hints 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 | None | 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. | None | 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. | None | 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. | None | C3 is occupied by a pawn, C2 is empty. Pawn is not moved from C3 to C6. |
|  |  | Check hints 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. | None | Hints should show that the pawn can-not move anywhere |
| SE-F5-009 | 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 | None | The piece should not be moved |
| SE-F5-010 |  | Check hints are displayed correctly for a pawn that can capture an enemy piece | | Continue from last test. Select the pawn on B7 | None | Hints should show that the pawn can move to B6 or B5, or capture the piece at A6 |
| SE-F5-011 | FR5 | Check the pawn can capture diagonally in front | | Continue from last test. Move pawn from B7 to A6 | None | Bishop at A6 is removed and the pawn at B7 is moved to A6. |
| SE-F5-012 | FR5 | Check hints 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 | None | Hints should show that the pawn can move one place forward, and not show that it can capture the bishop behind it |
| SE-F5-013 | FR5 | Check the pawn cannot capture diagonally behind | | Continue from last test. Attempt to move the pawn from H5 to G4. | None | Nothing should happen |
| **Bishop Movement** | | | | | | |
| SE-F5-101 | FR5 | Check the Bishop displays the correct moves at the start of the game | | Start a Fresh game, Select the Dark Squared bishop | None | Should not display any possible moves at all as the bishop is blocked |
| SE-F5-102 | FR5 | Check The Bishop can correctly display it’s 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 | None | Should display that it is able to move to B2 & C3 |
| SE-F5-103 | FR5 | Check The Bishop can move one vacant square on it’s color | | Start a Fresh game, Select the pawn at B2 and move it to B3, After black’s turn (G7 to G6) Move the Dark Squared bishop to B2 | None | The Dark Squared Bishop should Occupy the B2 square and the C1 square should be empty |
| SE-F5-104 | FR5 | Check if the bishop correctly displays it’s available moves on which it captures another piece | | Continue from last test, After black’s turn (H7 to H5) Select the Bishop | None | It should Display that it can Capture the Rook on H8 |
| SE-F5-105 | FR5 | Check The Bishop can move it’s full range on its own color | | Continue From Last Test, after black’s turn Move the Bishop from B2 to E5 | None | The Dark Squared Bishop Should Occupy E5 and B2 should be empty |
| SE-F5-106 | FR5 | Check if the bishop correctly displays it’s available moves on which it captures other pieces | | Continue from last test, After black’s turn (H5 to H4) Select the Bishop | None | 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 it’s own colors pieces | | Continue from last test Select The Dark Squared Bishop and try to Capture the white rook on A1 | None | 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 Dark Squared Bishop and Capture the pawn on C7 | None | The Dark Squared Bishop Occupies the C7 Square and pawn is no longer on the board |
| **Rook Movement** | | | | | | |
| SE-F5-201 | FR5 | Check hints are displayed correctly when the rook is blocked | | Start a fresh game. Select rook at H1 | None | Hints show that the rook cannot move anywhere |
| SE-F5-202 |  | Check rook can not move one place forward when blocked | | Continue from last test. Try to move rook | None | 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 | None | Rook is moved from H1 to H3 |
| SE-F5-204 |  | Check hints 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. | None | Hints 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 |  | Check rook can move four places forward | | Continue from last test. Move rook from H3 to H6. | None | Rook is moved to H6 |
| SE-F5-206 |  | Check rook can move one place left | | Continue from last test. Move black pawn from E7 to E5. Move rook from H6 to G6. | None | Rook is moved to G6 |
| SE-F5-207 |  | 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. | None | Rook is moved to A6 |
| SE-F5-208 |  | Check hints 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. | None | Hints display that indicate rook can be moved up to 3 places directly backwards, or up to 7 places directly right. |
| SE-F5-209 |  | Check rook can move three places backwards | | Continue from last test. Move white rook from A6 to A3. | None | Rook is moved to A3 |
| SE-F5-210 |  | 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. | None | Rook is moved to B3 |
| SE-F5-211 |  | Check hints 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. | None | Hints are displayed that the rook can move up to 3 places directly right, or capture pawn at F3. |
| SE-F5-212 |  | Check rook can capture a piece 4 places directly right | | Continue from last test. Move white rook at B3 to F3. | None | 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 king’s side Knight | None | The knight should be have possible moves on F3 and H3 |
| **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 | None | The Queen should have no possible moves as it is blocked |
| **King Movement** | | | | | | |
| SE-F5-501 | FR5 | Check the King displays the correct moves at the start of the game | | Start a fresh game, select the king | None | The king should not have any possible moves as it is blocked |
| **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 | None | 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 | None | 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 | None | The D5 and E5 Square should be vacant the White pawn should be on D6 |
| **Promotion Tests** | | | | | | |
| SE-F5-701 | FR5 |  | |  |  |  |
| **Castling Tests** | | | | | | |
| SE-F5-801 | FR5 |  | |  |  |  |
| **FR6 – Detecting Check** | | | | | | |
| SE-F6-001 | FR6 |  | |  |  |  |
| **FR7 – Detecting Checkmate** | | | | | | |
| SE-F7-001 | FR7 |  | |  |  |  |
| **FR8 – End of game** | | | | | | |
| SE-F8-001 | FR8 |  | |  |  |  |
| **FR9 – Quitting the game** | | | | | | |
| SE-F9-001 | FR9 |  | |  |  |  |
| **FR10 – Replay game** | | | | | | |
| SE-F10-001 | FR10 | Check when ‘replay game’ is selected A file explorer window appears | | Navigate to the main menu. Press ‘replay game’ button | None | A file explorer window is displayed |
| SE-F10-002 | FR10 | Check that the user is able to navigate through files using the explorer window by double clicking a folder | | Continue from last test. Navigate into a file by double clicking it | File explorer window shows folder that was navigated to | File explorer window shows the folder that was double clicked |
| SE-F10-003 | FR10 | 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-F10-004 | FR10 | Check that files other than XML (probably, depending on what we chose for file type) cannot be selected by the application, or are hidden by the file explorer | | Double click a file that is not a .XML | 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-F10-005 | FR10 | Check that invalid XML files are detected and not loaded by the application | | Double click a .XML file that is not a save file from the game. | 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-F10-006 | FR10 | Check that corrupted save files are detected and not loaded by the application | | Create a save file, open the save file and insert some random characters, and remove some. | 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-F10-007 | FR10 | Check that a valid save file is loaded | | Select a valid save file. | The replay screen open | A screen is displayed showing the starting board, with the option to jump to the next move |
| SE-F10-008 | FR10 | Check that the jump to next move button works | |  |  |  |
| SE-F10-009 | FR10 | Check that when the end of the game has been reached the user cannot ‘jump to the next move’ | |  |  |  |
| SE-F10-010 | FR10 | Check that the quit button in the replay works | |  |  |  |
| **FR11 – Storing and restoring the game state** | | | | | | |
| SE-F11-001 | FR11 |  | |  |  |  |

REFERENCES

[1] Software Engineering Group Projects: General Documentation Standards. C.W. Loftus. SE.QA.03. 2.5 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 |
| 0.25 | 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 |
| 0.35 | 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 |
|  |  |  |  |  |