

SE 3XA3: Test Report

Supreme Chess

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Contents

1	Functional Requirements Evaluation	1
2	Nonfunctional Requirements Evaluation	6
2.1	Usability	6
2.2	Performance	6
3	Comparison to Existing Implementation	7
4	Unit Testing	7
5	Changes Due to Testing	7
6	Automated Testing	8
7	Trace to Requirements	8
8	Trace to Modules	9
9	Code Coverage Metrics	11

List of Tables

1	Revision History	i
2	Trace to Requirements	8
3	Trace to Modules	9

List of Figures

Table 1: **Revision History**

Date	Version	Notes
2021-04-11	1.0	Revision 1 of the Test Report

1 Functional Requirements Evaluation

Test: T-FR1-1

Result: A user is able to connect to the server successfully.

Test: T-FR1-2

Result: A user is unable to connect to the server while it is not running.

Test: T-FR2-3

Result: A user is presented with a welcome screen when connecting to the application.

Test: T-FR3-1

Result: A user is presented with options to input a username and room name, and join the room.

Test: T-FR4-1

Result: A user is able to join a specified chat room after inputting a username and room name.

Test: T-FR4-2

Result: A user is unable to join a chat room before inputting a username and room name.

Test: T-FR18-1

Result: The board is initialized properly with the correct piece locations and view orientation.

Test: T-FR19-1

Result: The timers are initialized properly.

Test: T-FR20-1

Result: The white pieces are able to move and the black pieces are not. The white timer has begun counting down.

Test: T-FR21-1

Result: A user is unable to move the black pieces as the first move of the game.

Test: T-FR22-1

Result: A user is able to move the white pieces as the first move of the game with a legal move by dragging and dropping a piece.

Test: T-FR23-1

Result: A user has made a move and the system validated if it was legal or not.

Test: T-FR24-1

Result: A legal move updated the board state and flipped board orientation.

Test: T-FR25-1

Result: An illegal move had no effect on the board state and the board orientation remained the same.

Test: T-FR26-1

Result: Legal moves triggered a check for game termination.

Test: T-FR27-1

Result: A legal move that did not terminate the game caused the timers to swap

Test: T-FR28-1

Result: A legal move was verified as legal by the validation system.

Test: T-FR28-2

Result: An illegal move was verified as not legal by the validation system.

Test: T-FR29-1

Result: A legal move updates the board state.

Test: T-FR29-2

Result: An illegal move does not update the board state.

Test: T-FR30-1

Result: Two simultaneous legal moves will only update the board state once with the player who has control.

Test: T-FR31-1

Result: Any number of users in the same chat room were able to start chat.

Test: T-FR32-1

Result: Any number of users in the same chat room could open a chat window.

Test: T-FR33-1

Result: Any number of users in the same chat room could open a chat window simultaneously.

Test: T-FR34-1

Result: Any number of users in the same chat room have the option to end chat for themselves.

Test: T-FR35-1

Result: Any number of users in the same chat room have the option to end chat for themselves.

Test: T-FR36-1

Result: A user ended the chat for themselves and can no longer see the chat window. An option appears for the user to open the chat again.

Test: T-FR37-1

Result: Two users ended the chat for themselves simultaneously and both can no longer see the chat window. An option appears for both users to open the chat again individually.

Test: T-FR38-1

Result: A user ended the chat for themselves and then opened the chat again. All previous messages have been cleared from the chat for that user, but not for other users.

Test: T-FR39-1

Result: Two users ended the chat for themselves simultaneously and both can no longer see the chat window. An option appears for both users to open the chat again individually.

Test: T-FR40-1

Result: A game has started and both timers are initialized with 10:00 minutes of total time.

Test: T-FR41-1

Result: A game has started and a sequence of legal moves has caused the timers to pause and resume on their turns.

Test: T-FR41-2

Result: A game has started and a sequence of illegal moves has had no effect on the timers.

Test: T-FR42-1

Result: A game has started and termination conditions have been tested after every legal move.

Test: T-FR43-1

Result: A game has been played to a “checkmate” position and the game terminates with a checkmate.

Test: T-FR44-1

Result: A game has been played to a “stalemate” position and the game terminates with a draw.

Test: T-FR45-1

Result: Players have agreed to a draw and the game terminates with a draw.

Test: T-FR46-1

Result: One player has resigned the game and the game terminates with a resignation.

Test: T-FR47-1

Result: The timer for one player has reached 0:00 and the game terminates with a timeout.

2 Nonfunctional Requirements Evaluation

2.1 Usability

1. Test: T-UH2-1

Result: Over 90% of the subjects were able to play a move within five minutes of starting the program.

2.2 Performance

1. Test: T-PR1-1

Result: The average output time was much lower than the required 0.25 seconds.

2. Test: T-PR2-1

Result: The maximum response time was lower than the required 2 seconds.

3. Test: T-PR3-1

Result: The maximum response time between a move and the timer pausing was less than the required 0.1 seconds.

4. Test: T-PR8-1

Result: The RAM usage never exceeds 2GB at a time.

3 Comparison to Existing Implementation

Board State Comparison

1. Test: T-EI-1

Result: The team members were able to play the same moves on both systems and the same response occurred on both systems.

4 Unit Testing

No unit tests were required for this project as manual tests were more effective to verify overall behaviour.

5 Changes Due to Testing

1. The system interaction between game termination and functionality of individual components, like timers and buttons, was originally incorrect and found with tests T-FR42-1, T-FR43-1, T-FR44-1, T-FR45-1, T-FR46-, T-FR47-1. This lead to additions to the shared state module where more state was added.

6 Automated Testing

No automated testing was required for this project as manual tests were more effective to verify overall behaviour.

7 Trace to Requirements

Table 2: Trace to Requirements

Test ID	Requirement ID
T-FR1-1	FR1
T-FR1-2	FR1
T-FR2-1	FR2
T-FR3-1	FR3
T-FR4-1	FR4
T-FR4-2	FR4
T-FR18-1	FR18
T-FR19-1	FR19
T-FR20-1	FR20
T-FR21-1	FR21
T-FR22-1	FR22
T-FR23-1	FR23
T-FR24-1	FR24
T-FR25-1	FR25
T-FR26-1	FR26
T-FR27-1	FR27
T-FR28-1	FR28
T-FR29-1	FR29
T-FR29-2	FR29
T-FR30-1	FR30
T-FR31-1	FR31
T-FR32-1	FR32
T-FR33-1	FR33
T-FR34-1	FR34
T-FR35-1	FR35
T-FR36-1	FR36

T-FR37-1	FR37
T-FR38-1	FR38
T-FR39-1	FR39
T-FR40-1	FR40
T-FR41-1	FR41
T-FR41-2	FR41
T-FR42-1	FR42
T-FR43-1	FR43
T-FR44-1	FR44
T-FR45-1	FR45
T-FR46-1	FR46
T-FR47-1	FR47
T-UH2-1	UH2
T-PR1-1	PR1
T-PR2-1	PR2
T-PR3-1	PR3
T-PR8-1	PR8

8 Trace to Modules

Table 3: **Trace to Modules**

Test ID	Module ID
T-FR1-1	M5.3, M5.3.1, M5.3.3
T-FR1-2	M5.3, M5.3.1, M5.3.3
T-FR2-1	M5.3, M5.3.1
T-FR3-1	M5.2, M5.2.1, M5.2.2
T-FR4-1	M5.2, M5.2.1, M5.2.2, M5.2.4, M5.3, M5.3.3
T-FR4-2	M5.2, M5.2.1, M5.2.2, M5.2.4, M5.3, M5.3.3
T-FR18-1	M5.2, M5.2.3, M5.2.5, M5.2.6
T-FR19-1	M5.2, M5.2.4, M5.2.6, M5.3, M5.3.2
T-FR20-1	M5.2, M5.2.1, M5.2.6, M5.3, M5.3.2
T-FR21-1	M5.2, M5.2.1, M5.2.4, M5.2.6

T-FR22-1	M5.2, M5.2.1, M5.2.5, M5.2.6
T-FR23-1	M5.2, M5.2.5, M5.2.6
T-FR24-1	M5.2, M5.2.5, M5.2.6
T-FR25-1	M5.2, M5.2.5, M5.2.6
T-FR26-1	M5.2, M5.2.6
T-FR27-1	M5.2, M5.2.6, M5.3, M5.3.2
T-FR28-1	M5.2, M5.2.4, M5.2.6
T-FR29-1	M5.2, M5.2.3, M5.2.6
T-FR29-2	M5.2, M5.2.3, M5.2.6
T-FR30-1	M5.2, M5.2.3, M5.2.4
T-FR31-1	M5.3, M5.3.3
T-FR32-1	M5.3, M5.3.3
T-FR33-1	M5.2, M5.2.1, M5.3, M5.3.3
T-FR34-1	M5.2, M5.2.1, M5.3, M5.3.3
T-FR35-1	M5.2, M5.2.1, M5.3, M5.3.3
T-FR36-1	M5.2, M5.2.1, M5.3, M5.3.3
T-FR37-1	M5.2, M5.2.1, M5.3, M5.3.3
T-FR38-1	M5.2, M5.2.1, M5.3, M5.3.3
T-FR39-1	M5.2, M5.2.6, M5.3, M5.3.2
T-FR40-1	M5.2, M5.2.6, M5.3, M5.3.2
T-FR41-1	M5.2, M5.2.6, M5.3, M5.3.2
T-FR41-2	M5.2, M5.2.6, M5.3, M5.3.2
T-FR42-1	M5.2, M5.2.2, M5.2.3, M5.2.6
T-FR43-1	M5.2, M5.2.2, M5.2.3, M5.2.6
T-FR44-1	M5.2, M5.2.2, M5.2.3, M5.2.6
T-FR45-1	M5.2, M5.2.2, M5.2.3, M5.2.6
T-FR46-1	M5.2, M5.2.2, M5.2.3, M5.2.6
T-FR47-1	M5.2, M5.2.2, M5.2.3, M5.2.6
T-UH2-1	M5.2, M5.2.6
T-PR1-1	M5.2, M5.2.6
T-PR2-1	M5.2, M5.2.1, M5.2.2
T-PR3-1	M5.2, M5.2.1, M5.2.2
T-PR8-1	M5.2, M5.2.1, M5.2.2

9 Code Coverage Metrics

The development team has managed to reach our coverage goal, achieving 100% statement coverage and around 50% path coverage. For statement coverage, every line of code in the system was used. Please refer to section 7: trace to requirements, and section 8: trace to modules. This shows that every module is covered multiple times.