Software Validation & Test Cases Document

for

Checkers

Version 2.0.0

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Revision History

Name	Date	Reason For Changes	Version
1.0.0	12–08–19	Initial Draft	pp534
2.0.0	14–08–19	Final Draft and Revisions	mh3294

1 Introduction

1.1 Purpose of Document

The purpose of this document to document and demonstrate that our Checkers game design and functionality aligns with the requirements outlined in the referenced requirement document. This document includes validation and testing of all possible scenarios by defining accepting states and noting the actual outcome of each respective case.

1.2 Scope of Document

The scope of this document encompasses the three phases that are each unique parts in our overall game procedure. We chose to separate our tests into three phases because they are each independent in that they encapsulate similar tests, yet are dependent on each other via a linking action or procedure. This document will try to justify that our design has been tested and meets the entire specifications of our requirements, and will report any bug that exists within our testing suite.

1.3 References

All required references can be found in the preceding document at the terminal end. Most of these references will point towards are design and requirements document, which have been previously submitted.

2 Testing Environment

This section has brief information about the system environment where the test suite was performed and the information of the tester.

2.1 Developer's Environments

Machine Name	OS	Client/Server	JRE	Person	Date
patel_laptop	Windows 10	Client	Java 12	Patel,P	12–08–19
horger_desktop	Windows 10	Server	Java 12	Horger,M	14–08–19
zlotek_laptop	Linux Distro	Server	Java 12	Zlotek,J	19–08–19
carfagno_desktop	Windows 10	Client	Java 12	Carfagno, J	19–08–19

3 Testing Environment Setup and Prerequisites

Prerequisite

- This game has implemented a Java Swing GUI for interaction. Java 12.0 is needed on the target system in order for the user to properly see the UI without any issues.
- Just for testing purpose, our program can be tested on a single, localhost machine. For multiplayer games with other devices, a stable Internet connection is needed.
- A Drexel Account is required to interact with the lobby structure to satisfy the tests conditions.

4 Test Cases

This chapter is divided into four sections, each respective to each phase of the game. The first phase includes the launching portion of the game, as well as interacting with the key menus to launch lobbies. The second phase tests the validation and logic of gameplay. The Third phase, while small, tests the functionality of multiple sessions running concurrently in conjuncture with the server. Finally, the fourth phase tests win conditions and outlying cases. If a test is Work-In-Progress, this means we are crafting the test suite or finalizing the components used in the testing mechanism.

4.1 Test Phase 1: Starting Game

4.1.1 Description

This section covers the testing of the initial phase of launching the program, creating a lobby, joining a lobby and starting a new game. This section relies heavily on UI interaction with our Swing menus.

4.1.2 Prerequisites for this test case

An internet connection with a firewall rule allowing traffic on all ports, to be certain, is required to this phase. Localhost also works just fine, as long as two sessions are able to run on the target machine with no drawbacks.

4.1.3 Scenario

Item No.	Case	Expectation	Actual Outcome	Requirement Reference
1	Launch the game with active internet connection	GUI of Lobby menu should be launched	Passed	R1.1
2	Launch the game with server down	GUI Warning should be present	Passed	R1.2
3	Launch the game with no active internet connection	GUI Warning should be present	Failed, GUI not developed	N1.1
4	Launch the game outside of Drexel's internet connection	GUI Warning should be present	Work-In-Progress	N1.2
5	Create a lobby button clicked	Create a lobby ID	Passed	L1.1
6	Join a lobby button clicked	Once lobby selected from lobby menu, player should be able to join that session	Passed	L1.1
7	Create multiple sessions	No more then 10 lobbies should be allowed	Work-In-Progress	L2.2
8	Start 5 lobbies concurrently with 10 clients	There should be no warning present	Passed	L2.3
9	Start 10 lobbies with 11 clients	11th player should not able to create a lobby	Work-In-Progress	L2.3
10	Initialize Lobby with 2 clients	GUI should have 8X8 board with randomly assigned color for clients	Passed	G1
11	Client tries to connect to lobby with an invalid ID	GUI Warning should be present	Failed, GUI not developed	L2.6

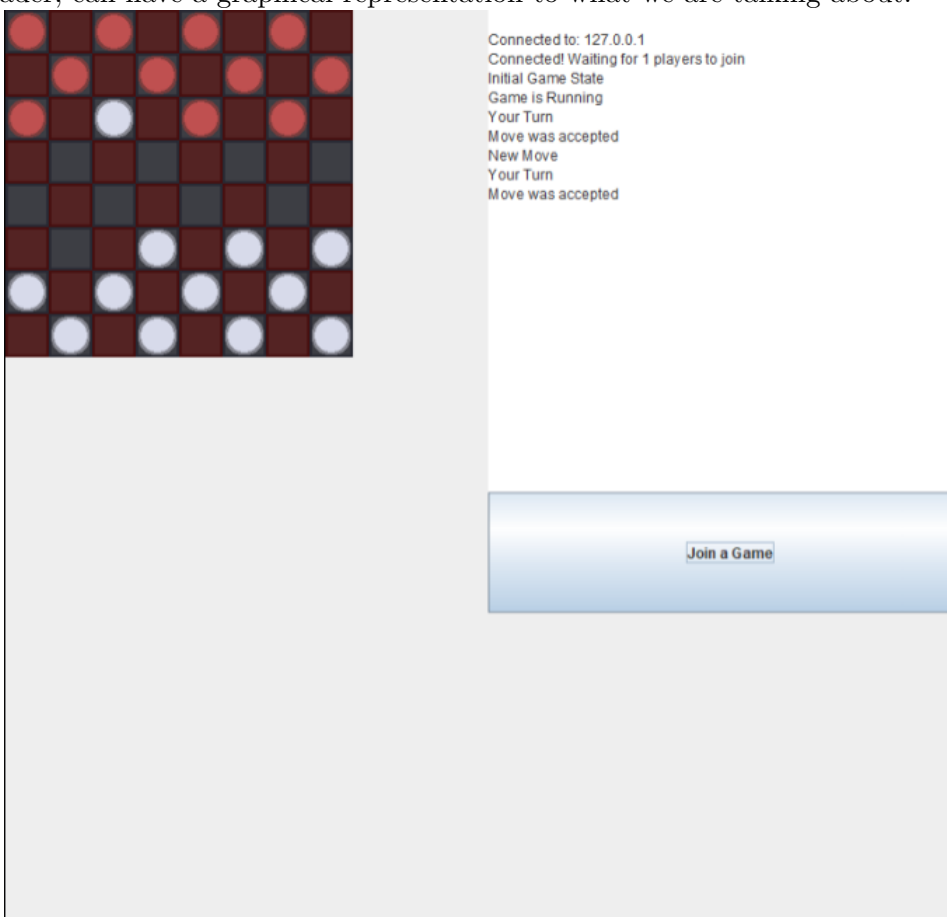
4.2 Test Phase 2: Gameplay Validation

4.2.1 Description

This section covers the testing of the gameplay validation system. This includes the testing of game moves, moves that are valid and invalid, jumps, and the process of king generation. These requirements to which they match up are mostly in the 6.2 Gameplay section of our requirements documentation. Finally, we want to make the distinction that we want to test the end-facing client, because that is the product we are sending as our deliverable.

4.2.2 Prerequisites for this test case

A valid lobby that has been initialized for an in-progress game. Note, we will be talking about the server validation of clients disconnecting and other similar processes in the next phase. For reference, we will be posting a picture of the board below, so you, the reader, can have a graphical representation to what we are talking about.



4.2.3 Scenario

Item No.	Case	Expectation	Actual Outcome	Requirement Reference
1	Black piece first move	Only player with black piece should make move	Passed	G4
2	White piece makes the first move	If Player with white piece makes the move, then it should be discarded and the piece should come back to the original position	Passed	G2
3	Piece makes a move	Can move diagonally in either direction and piece stays in new square	Passed	G5
4	Non-crowned piece tries to jump	Only jump and capture the opponent piece if there is an empty square above that targeted piece.	Passed	G5

Item No.	Case	Expectation	Actual Outcome	Requirement Reference
5	Non-crowned piece tries to jump multiple	If a jump is made over multiple piece against opponent with respect to 4, move is valid.	Passed	G5
6	Non-crowned piece tries to not move diagonally	If a piece move in horizontal or vertical direction then it should come back to original position	Passed	G5
7	Non-crowned piece moves backwards	If a piece tries to move backward diagonally, then it should be discarded and it should come back to original position	Passed	G5
8	Non-crowned piece has no space for jump	if there is not space to place the piece after the jump to capture, then it should come back to original position	Passed	G5
9	Non-crowned piece has no space for multiple jump	If jump made over player's own piece is valid, and next jump is not, only prompt the first jump	Passed	G5

Item No.	Case	Expectation	Actual Outcome	Requirement Reference
10	Non-crowned piece turns into king	If either player piece reaches to the 10th row from player direction then, piece should turn into a crowned piece	Passed	G6
11	Crowned piece makes a move	A crown can move in any four diagonal direction	Passed	G6
12	Crowned piece makes a jump	A crown can jump in any direction as long as test case 4 is valid	Passed	G6
13	Crowned piece makes multiple jumps	A crown can jump in any direction as long as test case 12 is true	Passed	G6
14	Crowned piece tries to not move diagonally	A crown cannot move horizontal or vertical; piece should return in original direction	Passed	G6
15	Crowned piece makes an invalid jump	If a jump is made over a player's own piece, the piece should return in original direction	Passed	G6
16	Crowned piece placed in the 10th row again	The crown piece state should not be affected in any way	Work-In-Progress	G6

4.3 Test Phase 3: Multiple

4.3.1 Description

This section covers the testing of the proper game performance of multiple sessions running at the same time. Most of our server tests are in this phase below, as they are independent of the client tests. The cases where they match are detailed in the final phase, along with the win conditions.

4.3.2 Prerequisites for this test case

More than one game lobby running for these tests to work. An active server must also be running on Drexel's network in order to properly achieve network results.

4.3.3 Scenario

Item No.	Case	Expectation	Actual Outcome	Requirement Reference
1	Lobby only sends activity between two fixed clients	Only changes in the game state should be seen between two clients and should not interfere other session game play	Work-In-Progress	L2.3
2	Client has poor network connection	Server should automatically alert the client connection	Work-In-Progress	N1.4
3	Client can't connect to the server within a reasonable time	Server should automatically close the requested connection	Passed	N2.4
4	Server shuts down unexpectedly	All lobbies are warned gracefully of the shutdown	Failure - need error handling	L2.4
5	Lobby concludes the game	No other lobbies should be opened or closed in any way	Passed	L2.5
6	Server starts back up after it terminated with lobbies active	No lobbies will be re-created as clients have disconnected	Work-In-Progress	N2.3

4.4 Test Phase 4: Ending the game

4.4.1 Description

This section covers the testing of the scenario when the game ends and all possibilities of further action that can be taken from the clients.

4.4.2 Prerequisites for this test case

At least one lobby in the active state, with the game in progress. Two clients are required for each of these test cases.

4.4.3 Scenario

Item No.	Case	Expectation	Actual Outcome	Requirement Reference
1	Piece makes a winning jump	If a piece makes a valid jump over the last piece, then that player should be declared the winner	Passed	6.2.1
2	Game Concludes	Player who won should receive the winner message, loser should receive the opposite message	Work-In-Progress	6.2.1
3	Client want to leave the lobby	Once a client quits the lobby, they should be returned to the lobby screen	Passed	6.2.2
4	Client leaves the lobby	The other connected client to the lobby is declared the winner	Work-In-Progress	6.2.2
5	After game is finished, both players want a rematch	A new lobby will be created with the same two clients	Failed - throwing errors	6.2.2
6	After game is finished, if one player doesn't want a rematch	Both players will return to the lobby screen	Work-In-Progress	6.2.2

Bibliography

[1] Team Big Chungus, *Software Requirements Specification*, CS 451-002, Drexel University, Summer 2019.

[2] Team Big Chungus, *Software Design Document*, CS 451-002, Drexel University, Summer 2019.