

CS 40800

Team 10: Test Plan

Project Title: LogicAI

Team Members: Indhu Meena Ramanathan, Richard Hansen, Steven Dellamore,
Columbus Holt

Functional Requirement 1

As a user, I would like to be able to enter my name upon my first time playing the game

Functional Test Cases

Test ID	0
Title	Enter Username
Instructions	On the start screen, enter a username
Expected Result	If username is valid, it should move into the game screen
Severity	Important

Equivalence Test Cases

Test ID	1
Title	Valid Username
Instructions	On the start screen, enter a valid username and click play
Expected Result	Should accept valid username and move into the game screen
Severity	Important

Test ID	2
Title	Blank Username
Instructions	On the start screen, enter a blank username and click play
Expected Result	Should request you to enter a valid username with an error
Severity	Important

Test ID	3
Title	Username too long (> 30 characters)
Instructions	On the start screen, enter a username that is greater than 30 characters
Expected Result	Should request you to shorten your username
Severity	Important

Test ID	4
Title	Numbered username
Instructions	On the start screen, enter a username that only consists of [0-9]
Expected Result	Should accept valid username and move into the game screen
Severity	Important

Boundary Test Cases

Test ID	5
Title	Username that is exactly 30 characters
Instructions	On the start screen, enter a username that is exactly 30 characters
Expected Result	Should accept valid username and move into the game screen
Severity	Important

Functional Requirement 2

As a user, I would like to be able to select the difficulty of the AI

Functional Test Cases

Test ID	6
Title	Select difficulty drop down
Instructions	On the start screen, click on the difficulty drop down
Expected Result	Should be given 4 options, easy, medium, hard, impossible
Severity	Critical

Test ID	7
Title	Select easy from difficulty drop down
Instructions	On the start screen, click the easy option on the difficulty drop down menu
Expected Result	App displays your new difficulty
Severity	Critical

Test ID	8
Title	Select medium difficulty
Instructions	On the start screen, click the medium option on the difficulty drop down menu
Expected Result	App displays your new difficulty
Severity	Critical

Test ID	9
Title	Select hard difficulty
Instructions	On the start screen, click the hard option on the difficulty drop down menu
Expected Result	App displays your new difficulty
Severity	Critical

Test ID	10
Title	Select impossible difficulty
Instructions	On the start screen, click the impossible option on the difficulty drop down menu
Expected Result	App displays your new difficulty
Severity	Critical

Boundary Test Cases

Test ID	11
Title	No difficulty selection
Instructions	On the start screen, do not click any difficulty
Expected Result	App displays the default difficulty (easy)
Severity	Critical

Functional Requirement 3

As a user, I would like to be able to press a button to start the game

Functional Tests

Test ID	12
Title	Click Start button
Instructions	On the start screen, click the start button
Expected Result	App brings you into the game board
Severity	Critical

Functional Requirement 4

As a user, I would like to be remembered [by the browser] so that information is stored between sessions

Functional Tests

Test ID	13
Title	Check if username saved
Instructions	On the start screen, enter a valid username, and then refresh your browser
Expected Result	App should display the username you created
Severity	Workaround

Test ID	14
Title	Check if difficulty saved
Instructions	On the start screen, enter new difficulty and then refresh your browser

Expected Result	App should display the difficulty you changed
Severity	Workaround

Test ID	15
Title	Check if map saved
Instructions	On the start screen, select a new map and then refresh your browser
Expected Result	App should display the new map you selected
Severity	Workaround

Equivalence Test Cases

Test ID	16
Title	Invalid username cached
Instructions	On the start screen, enter a invlaid username and then refresh
Expected Result	App should not save the invalid username
Severity	Workaround

Functional Requirement 5

As a user, I would like to be able to select a game board to play on

Functional Tests

Test ID	17
Title	Default map
Instructions	On the start screen, click play

Expected Result	App should display the default starter map
Severity	Critical

Test ID	18
Title	Select new map
Instructions	On the start screen, cycle to a different map and select it
Expected Result	App should display the new map selected
Severity	Critical

Test ID	19
Title	Play with new map
Instructions	On the start screen, click start when the new map is selected
Expected Result	App should bring you to the game screen with your new map
Severity	Critical

Boundary Test Cases

Test ID	20
Title	Select multiple maps
Instructions	On the start screen, select one map, and then select a different one
Expected Result	App should show display the new map as your current map

Severity	Critical
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Functional Requirement 6

As a user, I would like to be able to navigate to the game board page so that I would be able to go to the game

Functional Tests

Test ID	21
Title	Start game
Instructions	On the start screen, click start game
Expected Result	App should display the game with the appropriate information for the game boards and difficulty
Severity	Critical

Test ID	22
Title	Check game credentials
Instructions	Try to go around the login screen, straight to the game screen
Expected Result	App should redirect you to the login screen
Severity	Workaround

Functional Requirement 7

As a user, I would like to be given 20 different game boards so that I can play different versions of the game

Functional Tests

Test ID	23
Title	Cycle clockwise through maps (< 20)
Instructions	On the start screen, click the right arrow to cycle through the maps
Expected Result	App should display the new game board every time its clicked
Severity	Important

Test ID	24
Title	Cycle counterclockwise through maps (< 20)
Instructions	On the start screen, click the left arrow to cycle through the maps
Expected Result	App should display the new game board every time it switches
Severity	Important

Test ID	25
Title	Cycle maps counterclockwise > 30 times
Instructions	On the start screen, click the left arrow more than 30 times
Expected Result	Should be given the same map you clicked on your 10th click
Severity	Important

Test ID	26
Title	Cycle maps clockwise > 30 times

Instructions	On the start screen, click the right arrow more than 30 times
Expected Result	Should be given the same map you clicked on your 10th click
Severity	Important

Boundary Test Cases

Test ID	27
Title	Cycle maps clockwise 20 times
Instructions	On the start screen, click the right arrow exactly 20 times
Expected Result	Should be given the map you started with
Severity	Important

Test ID	28
Title	Cycle maps counterclockwise 20 times
Instructions	On the start screen, click the left arrow exactly 20 times
Expected Result	Should be given the map you started with
Severity	Important

Functional Requirement 8

As a user, I would like to have dotted lines connecting vertices so that I know all my available moves on the game board

Functional Tests

Test ID	29
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Title	Dotted Lines
Instructions	On the game screen, all the available moves should be displayed
Expected Result	All valid game moves should be displayed with dotted lines
Severity	Important

Test ID	30
Title	Dotted Lines four sides
Instructions	On the game screen, every vertex should have only 4 edges connect it.
Expected Result	All valid game moves should be displayed with dotted lines. Each vertex should have exactly 4 edges connecting to it
Severity	Important

Functional Requirement 9

As a user, I would like to be able to select lines and have them highlight, so I know what moves I have made on the game board

Functional Tests

Test ID	31
Title	Highlighted Dotted line
Instructions	On the game screen, hover the mouse over a dotted line
Expected Result	App should turned the dotted line into a solid line

Severity	Important
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Test ID	32
Title	Opponent dotted line
Instructions	On the game screen, have the AI make a move
Expected Result	The dotted line where the AI moved should be removed and replaced with a solid line
Severity	Important

Test ID	33
Title	Non-Highlighted Dotted line
Instructions	On the game screen, do not hover over any dotted lines
Expected Result	All lines that have not yet been selected should be shown as dotted
Severity	Important

Functional Requirement 10

As a user, I would like to be able to capture shapes, by selecting enclosing lines, so I can capture shapes to win the game

Functional Tests

Test ID	34
Title	Player Capture Shape
Instructions	On the game screen, complete a shape
Expected Result	App should highlight the captured

	shape in the player's color
Severity	Critical

Test ID	35
Title	Player move again
Instructions	Have the player capture a shape
Expected Result	App should let the player move again
Severity	Critical

Boundary Test

Test ID	36
Title	Player Near Shape Side Select
Instructions	On the game screen, select 3 sides of a shape and one side of a nearby shape with no prior sides selected
Expected Result	No shape should be highlighted in the Player's color
Severity	Critical

Functional Requirement 11

As a user, I would like to be able to see my opponent's moves highlighted, allowing me to see what moves they have made on the game board

Functional Tests

Test ID	37
Title	AI Capture Square

Instructions	On the game screen, have the AI complete a shape
Expected Result	App should highlight the captured square in the AI color
Severity	Critical

Test ID	38
Title	AI move again
Instructions	Have the AI capture a shape
Expected Result	App should display the next move from the AI
Severity	Critical

Functional Requirement 12

As a user, I would like to be able to see the score of the match so that I know if I am winning or not

Functional Tests

Test ID	39
Title	Score Counter Display
Instructions	Hit the play button
Expected Result	The game loads and a score counter with initial value 0-0 should be visible
Severity	Important

Test ID	40
Title	Score AI
Instructions	Have the AI take a square

Expected Result	AI's scoreboard should be increased by one
Severity	Important

Test ID	41
Title	Score Player
Instructions	Have the player take a square
Expected Result	Players scoreboard should be increased by one
Severity	Important

Test ID	42
Title	Score accuracy
Instructions	Have the player take 2 squares and AI take 3
Expected Result	Score board should read (player)2-(AI)3
Severity	Important

Boundary Test

Test ID	43
Title	Post Game Score Counter Display
Instructions	Finish a game and click back to the main menu
Expected Result	The score counter should no longer be visible
Severity	Important

Functional Requirement 13

As a user, I would like to be able to see what shapes my opponent has captured, so I can view the current board state

Functional Tests

Test ID	44
Title	Captured Shape Display
Instructions	On the game screen, perform a move that will result in the AI making a move that will capture a shape
Expected Result	The shape captured by the AI should be filled with a color separate from the player's color
Severity	Critical

Equivalence Tests

Test ID	45
Title	Captured Near Shape Display
Instructions	On the game screen, perform a move that will result in capturing a square next to the AI's previously captured shape
Expected Result	The shape captured by the Player should be filled with a color separate from the AI's color, and the nearby shape should remain the same
Severity	Critical

Boundary Tests

Test ID	46
Title	Captured Final Shape Display
Instructions	On the game screen, perform a move that will result in the AI making a move that will capture the final shape of the game
Expected Result	The final shape captured by the AI should be filled with a color separate from the Player's color and all other shapes should maintain their color
Severity	Critical

Functional Requirement 14

As a user, I would like to be able to capture multiple squares, and have my score update accordingly, so I can see my current performance

Functional Tests

Test ID	47
Title	Match Player Score Increment
Instructions	On the game screen, make a move that would increase the Player's score
Expected Result	Score counter should update the player's score
Severity	Important

Test ID	48
Title	Match AI Score Increment
Instructions	On the game screen, allow the AI to make a move that would increase

	the AI's score
Expected Result	Score counter should update the AI's score
Severity	Important

Test ID	49
Title	Two square capture Player
Instructions	On the game screen, have the player make a move that captures two squares
Expected Result	Gamescore should accurately reflect both areas being added
Severity	Important

Test ID	50
Title	Two square capture AI
Instructions	On the game screen, have the AI make a move that captures two squares
Expected Result	Gamescore should accurately reflect both areas being added
Severity	Important

Equivalence Tests

Test ID	51
Title	Score Counter Increment Target
Instructions	On the game screen, make any move that would adjust the score or result in the AI making a move that would adjust the score

Expected Result	The score counter only increments the score of the user making the move.
Severity	Important

Boundary Tests

Test ID	52
Title	Final Move Score Count
Instructions	On the game screen, make the move prior to the AI's final move.
Expected Result	End game score is correctly incremented based off the final move(s) of the game
Severity	Important

Functional Requirement 15

As a user, I would like the game to end once all available moves have been taken, and a final score being calculated

Functional Tests

Test ID	53
Title	Final Game Move
Instructions	Perform a move that will result in the AI making a move that will result in the end of the game
Expected Result	The game should conclude, and the final score should be calculated
Severity	Critical

Equivalence Tests

Test ID	54
Title	Non-Final Game Move
Instructions	Perform a move that should not conclude the game
Expected Result	The game should not conclude
Severity	Critical

Boundary Tests

Test ID	55
Title	Post-Final Game Finishing Move Validation
Instructions	On the game screen, after performing a move that concludes the game, attempt to make a post-conclusion concluding move.
Expected Result	The move should be precluded
Severity	Critical

Functional Requirement 16

As a user, I would like to see a preview of the game board that I can choose from so that I can select one that I am interested in

Functional Tests

Test ID	56
Title	Preview game board
Instructions	On the start screen, select a new game board to play with

Expected Result	Should get a preview of your updated game board
Severity	Workaround

Equivalence Tests

Test ID	57
Title	Preview game board more
Instructions	On the start screen, select a new game board to play with. Then select a new game board
Expected Result	Should get a preview of your updated game board
Severity	Workaround

Boundary Tests

Test ID	58
Title	Check preview on exactly 20 map changes
Instructions	Preview 20 different maps
Expected Result	You should be able to see all 20 different maps given by the game
Severity	Workaround

Functional Requirement 17

As a user, the game board is able to distinguish between shapes captured by me and my opponent

Functional Tests

Test ID	59
Title	Player takes shape
Instructions	Select an edge that would complete a shape
Expected Result	The completed shape should be colored so the user knows that they have taken the shape
Severity	Important

Test ID	60
Title	Altakes shape
Instructions	Have the AI select an edge that would complete a shape
Expected Result	The completed shape should be colored so the user knows that the AI has taken that shape
Severity	Important

Functional Requirement 18

As a user, I would like to only be able to choose a unique name

Functional Tests

Test ID	61
Title	Create name
Instructions	Enter a name in the front page to be set as their username
Expected Result	The name is rendered on the game screen
Severity	Important

Equivalence Tests

Test ID	62
Title	Create unique name
Instructions	Enter a name in the front page to be set as their username that is unique
Expected Result	The backend and database checks if the game is unique and name is rendered on the game screen
Severity	Important

Test ID	63
Title	Create existing name
Instructions	Enter a name in the front page that already exists
Expected Result	An error is shown that no progress can be made with a "Unique name" error and does not allow the user to play the game
Severity	Important

Boundary Tests

Test ID	64
Title	Empty name
Instructions	Do not enter a name
Expected Result	An error is shown that no progress can be made with a "No name" error and does not allow the user to play the game
Severity	Important

Functional Requirement 19

As a user, I would like to view my previous game score at the end of the game so I can see how well I competed against the AI

Functional Tests

Test ID	65
Title	View Score
Instructions	Make a move and view game state
Expected Result	Score is displayed
Severity	Important

Equivalence Tests

Test ID	66
Title	Move that increases game score
Instructions	Make a move by selecting an edge that would complete the shape
Expected Result	Game score is increased proportionally to the area of the shape selected and displayed on the screen
Severity	Important

Test ID	67
Title	Move that keeps game score
Instructions	Make a move by selecting an edge that would not complete a shape
Expected Result	Game score is shown the same as the previous score and displayed

	on the screen
Severity	Important

Boundary Tests

Test ID	68
Title	Move does not decrease game score
Instructions	Make a random move on the game board
Expected Result	Game score is shown appropriately, if the player completes a shape, their score is updated. If the player does not complete a shape, their score remains the same.
Severity	Important

Functional Requirement 20

As a user, I would like to have a quick-play option so I can immediately get into the game without having to make a username

Functional Tests

Test ID	69
Title	Quickplay start
Instructions	On the start screen, click on the quickplay button
Expected Result	Should start the game with random settings
Severity	Important

Equivalence Tests

Test ID	70
Title	Quickplay start invalid username
Instructions	On the start screen, enter an invalid username and click quickplay
Expected Result	Should start the game with random settings
Severity	Important

Test ID	71
Title	Quickplay start blank username
Instructions	On the start screen, keep the username blank and click quickplay
Expected Result	Should start the game with random settings
Severity	Important

Test ID	72
Title	Quickplay start numbered username
Instructions	On the start screen, make the username only number [0,9] and click quickplay
Expected Result	Should start the game with random settings
Severity	Important

Functional Requirement 21

As a user, I would like to view my previous score ranked against the

previous user scores, so I know how well my previous game compares

Functional Tests

Test ID	73
Title	Highlighting score name
Instructions	On the results screen, check the previous scores
Expected Result	Your scores should be highlighted
Severity	Important

Equivalence Tests

Test ID	74
Title	Completed game
Instructions	On the results screen, check your previous score
Expected Result	Previous game score is displayed and highlighted
Severity	Workaround

Test ID	75
Title	Incompleted game
Instructions	On the results screen, check the scoreboard
Expected Result	Current score should not on the scoreboard
Severity	Workaround

Boundary Tests

Test ID	76
Title	Check min and max scores
Instructions	Ensure that the lowest possible, and highest possible scores display and are sorted correctly
Expected Result	All entries are sorted by score
Severity	Workaround

Functional Requirement 22

As a user, I would like to be able to scroll through multiple past high scores, to see past scores

Functional Tests

Test ID	77
Title	Score scrolling
Instructions	Based on the user's scroll position, the correct section of the highscores table is listed
Expected Result	Ability to scroll on highscores table
Severity	Workaround

Boundary Tests

Test ID	78
Title	Top/bottom scrolling
Instructions	When scrolled to the top or bottom entries, they are displayed correctly
Expected Result	All entries in table can be displayed via scrolling

Severity	Workaround
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Functional Requirement 23

As a user, I would like to navigate back to the home page when I complete a game

Functional Tests

Test ID	79
Title	Completed game navigation
Instructions	When a game is completed, and the navigate button is selected, the home page is loaded
Expected Result	Correctly navigate to home page
Severity	Important

Equivalence Tests

Test ID	80
Title	Selecting outside button region
Instructions	When a click is placed outside the button region, ensure the navigation is not run
Expected Result	Navigation not run when clicking outside button region
Severity	Workaround

Test ID	81
Title	Selecting inside button region
Instructions	When a click is placed inside the button region, ensure the

	navigation is run
Expected Result	Navigation runs when selecting within the region
Severity	Workaround

Functional Requirement 24

As a user, I would like to see a timer for how long I've been playing the current game

Functional Tests

Test ID	82
Title	Clock timer
Instructions	Check if clock timer updates
Expected Result	Clock timer updates correctly over time to show correct game time
Severity	Workaround

Equivalence Tests

Test ID	83
Title	Clock after time after x seconds
Instructions	After waiting x seconds from starting the game, the clock timer shows x seconds
Expected Result	Clock displays correct time after x seconds
Severity	Workaround

Test ID	84
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Title	Clock time in multiple games
Instructions	When a game is completed, and then another game starts, the clock resets correctly
Expected Result	Clock starts at 0 after every game
Severity	Workaround

Boundary Tests

Test ID	85
Title	Start time
Instructions	When game is just started, ensure clock starts at 0
Expected Result	Clock displays 0 at start of game
Severity	Workaround

Functional Requirement 25

As a user, I would like to be able to have a trained agent that is able to pick edges on the game board so that I would be able to have an opponent

Functional Tests

Test ID	86
Title	Agent line selection
Instructions	The agent sends back line selections
Expected Result	The line choice corresponds to a space on the gameboard
Severity	Critical

Equivalence Tests

Test ID	87
Title	Select all possible edges on board
Instructions	The agent sends back a selection for each of the possible board edges
Expected Result	The agent can select all board edges
Severity	Critical

Boundary Tests

Test ID	88
Title	Selecting same edge twice
Instructions	The agent cannot send back the same edge twice as a choice
Expected Result	Agent only ever selects an edge once
Severity	Critical

Test ID	89
Title	Selecting non-existent edge
Instructions	The agent cannot select an edge value that does not exist
Expected Result	Agent only selects existing edge values
Severity	Critical

Functional Requirement 26

As a user, I would like to be able to have a trained agent that is able to play with various levels of difficulty against me so that I can decide how I would like to play

Functional Tests

Test ID	90
Title	Select agent difficulty
Instructions	When agent difficulty is selected, the agent performance is adjusted
Expected Result	Agent can be easy/medium/hard
Severity	Workaround

Equivalence Tests

Test ID	91
Title	Selecting between difficulties
Instructions	When selecting difficulties in sequence, only the most recent difficulty is kept
Expected Result	Difficulty selection is chosen correctly
Severity	Workaround

Test ID	86
Title	Correct difficulty is loaded
Instructions	When a difficulty is selected, ensure that the correct difficulty is loaded
Expected Result	Selecting easy/medium/hard returns the easy/medium/hard AI

Severity	Workaround
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Boundary Tests

Test ID	92
Title	No difficulty selected
Instructions	User does not specify a difficulty before starting the game, a default difficulty is chosen
Expected Result	Can start a game without selecting a difficulty
Severity	important

Functional Requirement 27

As a user, I would like to have an agent that is trained against multiple models so that I would be able to have a variety of different boards to play with

Functional Tests

Test ID	93
Title	Board/Agent matching
Instructions	When a board is loaded, the corresponding agent is also loaded
Expected Result	Load the correct agent for a given board
Severity	Important

Equivalence Tests

Test ID	94
Title	Have a valid model per board

Instructions	When a board is selected, there is an available model to be loaded
Expected Result	All boards are attached to a model
Severity	Workaround

Test ID	95
Title	Board with unique model
Instructions	User selects all possible boards for multiple games
Expected Result	Each board is unique and the board chosen does not have the same model as another model
Severity	Workaround

Boundary Tests

Test ID	96
Title	Selecting boards multiple times
Instructions	When selecting different boards multiple times, the correct agent is loaded for the last board selected
Expected Result	Only last board and last agent are chosen
Severity	Workaround

Functional Requirement 28

As a user, I would like to have a way to go back once the game started so that if I clicked the wrong board or difficulty I can easily change back

Functional Tests

Test ID	97
Title	Going back
Instructions	On the game screen, click the back button
Expected Result	Should be redirected to the login screen
Severity	Workaround

Test ID	98
Title	Going back invalid username
Instructions	On the game screen, click the back button, then enter a invalid username
Expected Result	Should be redirected to the login screen, but not allowed to go back into the game
Severity	Workaround

Test ID	99
Title	Going back, changing difficulty
Instructions	On the game screen, click the back button and change the difficulty
Expected Result	Should be redirected to the login screen, and allow for a difficulty change
Severity	Workaround

Test ID	100
Title	Going back, changing map
Instructions	On the game screen, click the back

	button and change the map
Expected Result	Should be redirected to the login screen, and allow for a new map to be selected
Severity	Workaround