Criterion B: Design

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Test Plan

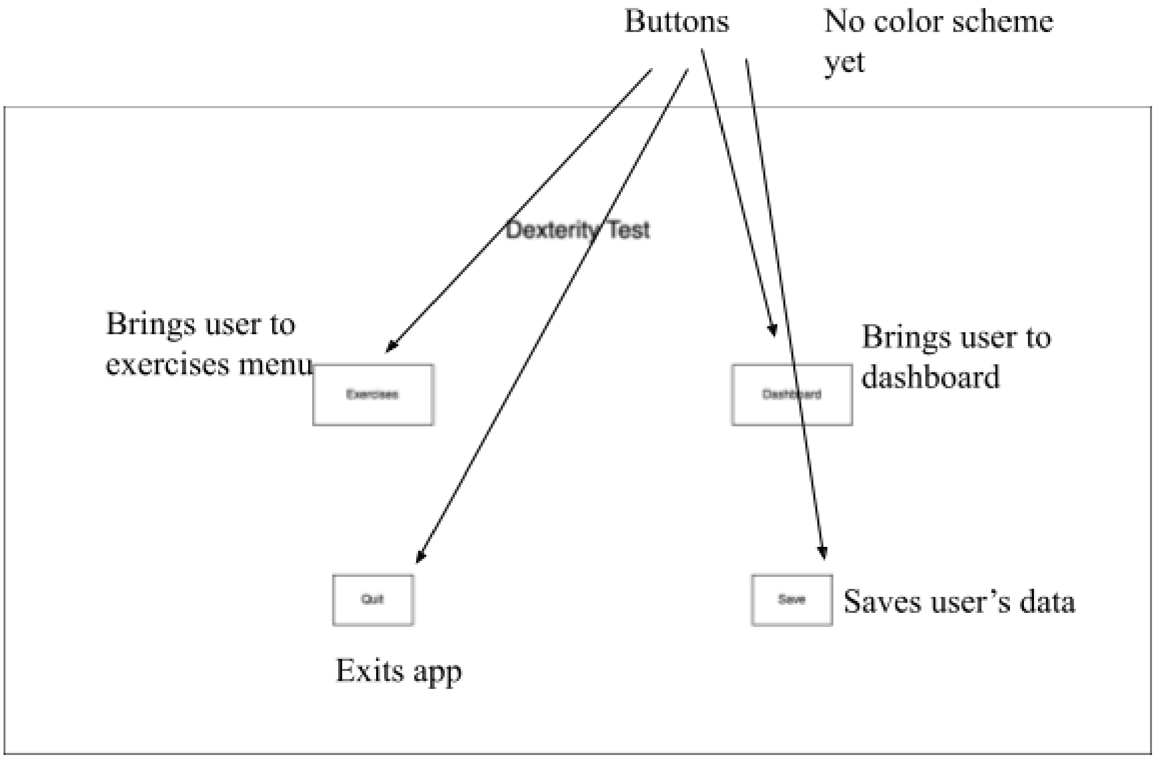
Test No.	Test Details	Test Data	Expected Results
1	*Test the variety of exercises* Reason: To ensure user can improve in everywhere they need. Success Criteria 1: The application should have 5 functioning exercises to test hand-eye coordination, memory, and reaction time.	Normal Data: Exercises page the user can easily navigate to that displays all exercises which the user can also navigate to.	The application should be able to display each exercise and explain how each of them work.
2	*Test for correct exercise scores* Reason: The user needs to be shown the correct result they got. Success Criteria 2: Calculate the scores for each of the tests/ exercises and display them.	Normal Data: Scores are displayed after the exercise and in the dashboard menu. Scores update when a better score is achieved.	The application should show the user their result directly after the exercise is finished and the scores should be displayed in the dashboard menu.
3	*Test the saving system* Reason: If the user were to close the app and the saving system doesn't work all their progress would be gone. Success Criteria 3: User must be able to save/ load/ delete the data from their exercises.	Normal Data: The user's scores are displayed in the dashboard menu after closing and reopening (then pressing the "load" button. Extreme Data: If the user immediately goes and does exercises after saving data then goes back to the dashboard menu and clicks the "load" button, the	The application should provide "save" buttons to press and automatically save when the "quit" button is pressed. When the "load" button is pressed if there is saved data that data will be displayed but if there isn't, nothing happens. The "delete" button deletes all the saved data.

		user’s old data is replaced with the saved data.	
4	*Test the Reaction Time Test* Reason: Reaction time test must function properly so that the user is provided with accurate scores. Success Criteria 4: The reaction time test must accurately measure the amount of time it takes for a user to react and find the average of five tests in milliseconds.	Normal Data: The exercise gives the user 5 tries to react as fast as possible to the box turning red. Afterwards, the average of the tries was displayed in milliseconds.	The application should measure the time the user takes to react then take the average of 5 tries and show the user’s final score in milliseconds.
5	*Test the Sequence Memory Test* Reason: Sequence memory test must function properly so that the user is provided with accurate scores. Success Criteria 5: The sequence memory test must use a random pattern of buttons every time and with every level of the test the length of the sequence must increase.	Normal Data: The exercise creates a random sequence of buttons light up one at a time and the length of the sequence increases as the user progresses and it gives the user an unlimited amount of time to answer.	The application should light up buttons red in a specific sequence that will get harder as the user continues to get the sequence right. The user must only be able to press the buttons when the user is done being shown the sequence.
6	*Test the Aim Trainer* Reason: The aim trainer must function properly so that the user is provided with accurate scores. Success Criteria 6: The aim trainer must provide a certain amount of targets appearing one after another when the user clicks on it, provide an accurate measurement of the time taken for each target, and determine the average time taken, in milliseconds.	Normal Data: 30 targets are shown in succession. After each target is clicked, the average time taken to click each target is calculated and displayed to the user in milliseconds. Abnormal Data: The target occasionally disappears after changing the window size, most likely because the random position it	The application should display a target for the user to press, then when pressed the target will appear in a random location in the window. This should repeat 30 times and the user should be shown the average of the 30 times in milliseconds.

		appears in is outside the window.	
7	*Test the Language Memory Test* Reason: The language memory test must function properly so that the user is provided with accurate scores. Success Criteria 7: The language memory test must use an array of at least 500 words and provide a random word from that array approximately ½ of the time and create a new array of all the words the user has already been shown and show a random word from that list approximately ½ of the time. The user should be given 3 lives, and the test will end when the user runs out of lives.	Normal Data: A random word is displayed and when either the "new" or "seen" button is pressed depending on if the word was new or seen the user will lose a life. When a new word is recognized to be new by the user it becomes a seen word. Abnormal Data: At the beginning of the test, the same seen word sometimes appears multiple times, however this should just be due to chance.	The application should display a word and then allow the user to choose whether that word has been shown before or not using the "new" or "seen" buttons and must keep track of how many times the user got it right.
8	*Test Number Memory Test* Reason: The number memory test must function properly so that the user is provided with accurate scores. Success Criteria 8: The number memory must be able to show the user a random number whose amount of digits increases as the level increases. It must allow the user to input the number they think is the answer, use the return key to enter their answer and use the delete key to delete the most recently inputted number. The user must only be able to input numbers.	Normal Data: The user is shown a random number and is given 3 seconds to memorize the number before it disappears and the user has to input what number they think it is. Each time the user gets the number right the number is randomly regenerated but with one more digit. Extreme Data: At very high digits the length of the number doesn't increase and could stay the same length	The application should display a randomly generated number with a set amount of digits with the user being given 3 seconds to memorize the number and only allow the user to input their answer when the timer is done counting down. The user should also only be allowed to input numbers as well as be able to delete the most recently inputted number and confirm their answer.

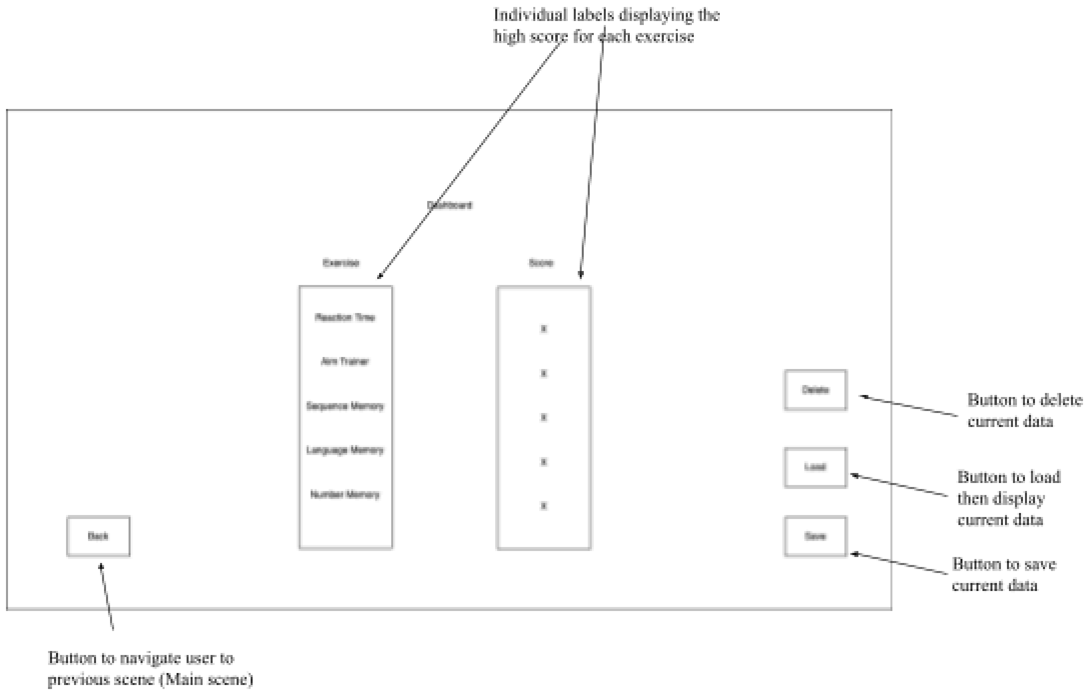
		of digits.	

Designs:



The main menu scene is the first screen the user will be shown when opening the app, which is why it's called main.

Screenshot #1: Main Scene Initial Design



Individual labels displaying the high score for each exercise

Button to delete current data

Button to load then display current data

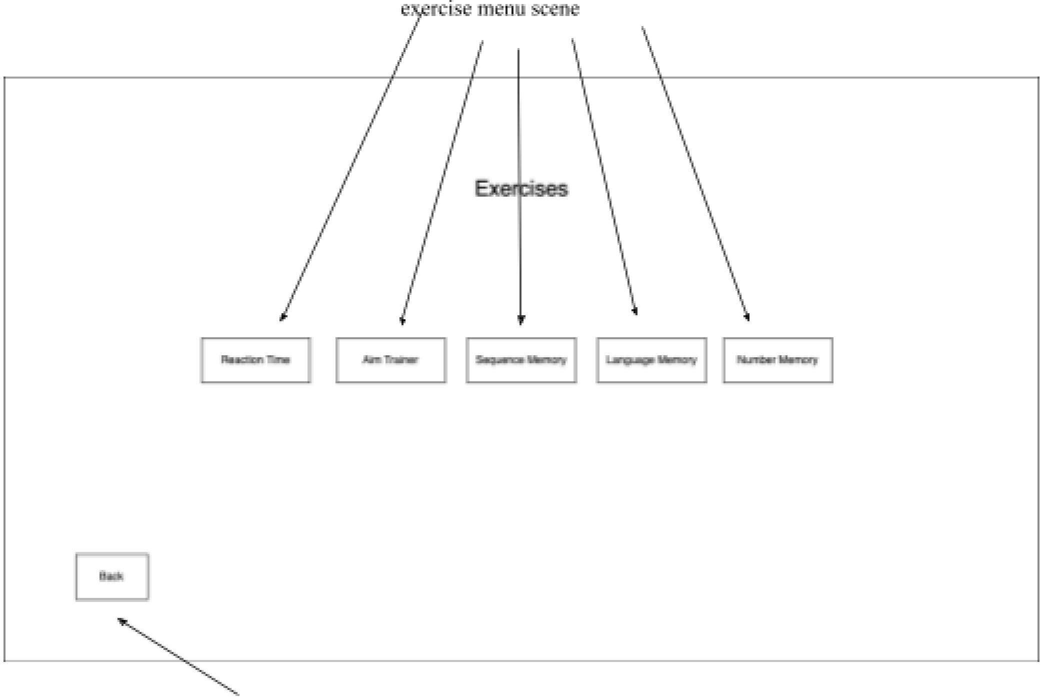
Button to save current data

Button to navigate user to previous scene (Main scene)

The dashboard is used to display the user's high scores and delete the user data if the user wants to.

Screenshot #2: Dashboard Scene Initial Design

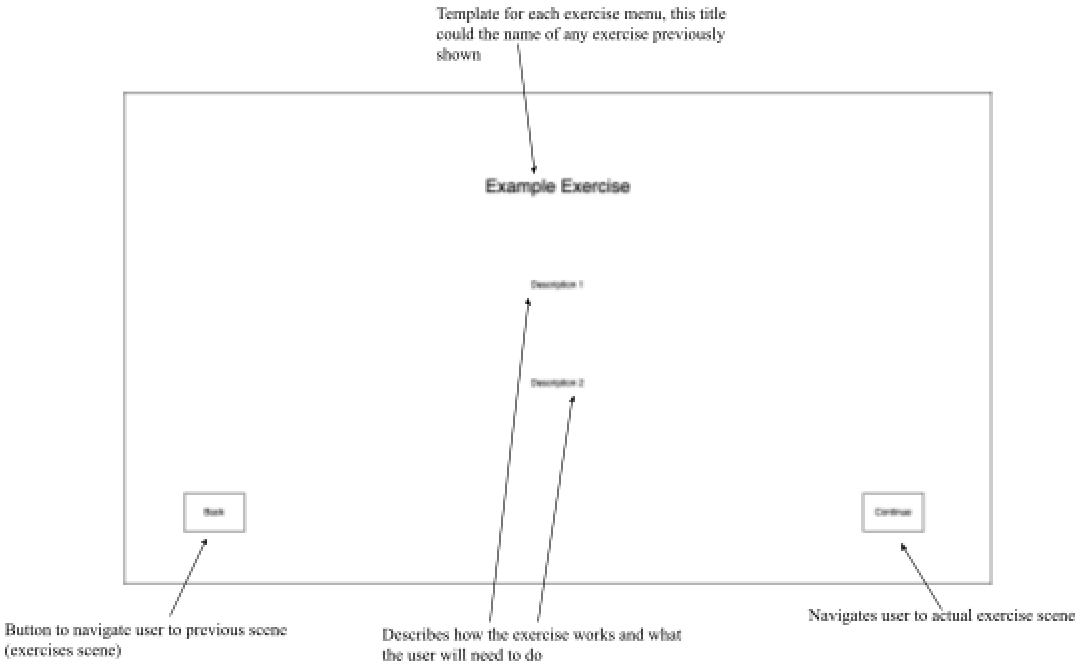
Buttons to navigate user to desired exercise menu scene



Button to navigate user to previous scene (main scene)

The exercises scene shows the user the exercise options and allows the user to navigate to their desired exercise easily.

Screenshot #3: Exercises Scene Initial Design



Template for each exercise menu, this title could the name of any exercise previously shown

Button to navigate user to previous scene (exercises scene)

Describes how the exercise works and what the user will need to do

Navigates user to actual exercise scene

The exercise menu scene allows the user to understand the exercise their doing and allows them to anticipate what the exercise will be like.

Screenshot #4: Example Exercise Menu Scene Initial Design

Flowcharts:

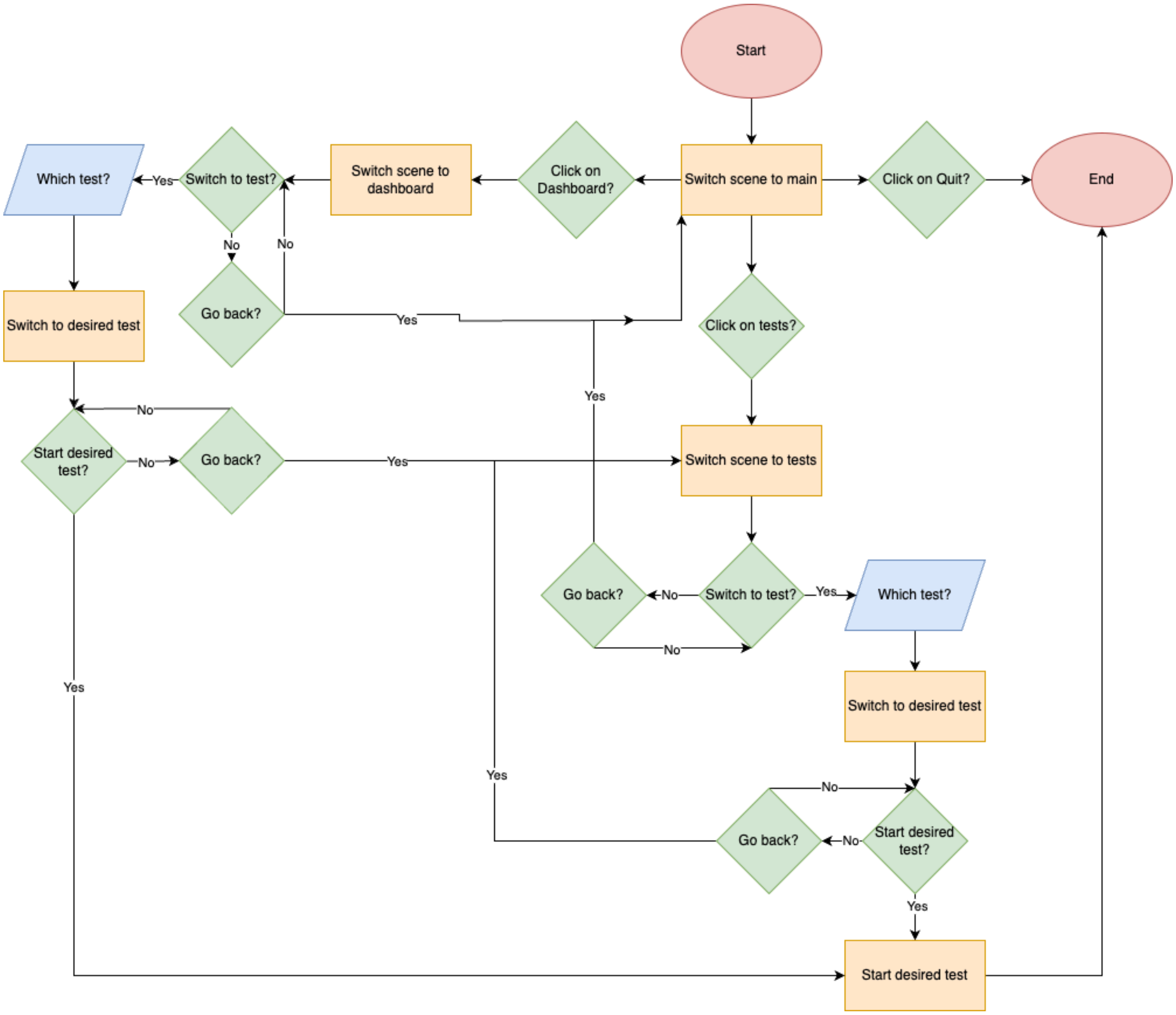


Figure #1: Menu Navigation System

Figure #1 shows how the user will be able to navigate through the app, going through the main scene to the dashboard to all the exercises.

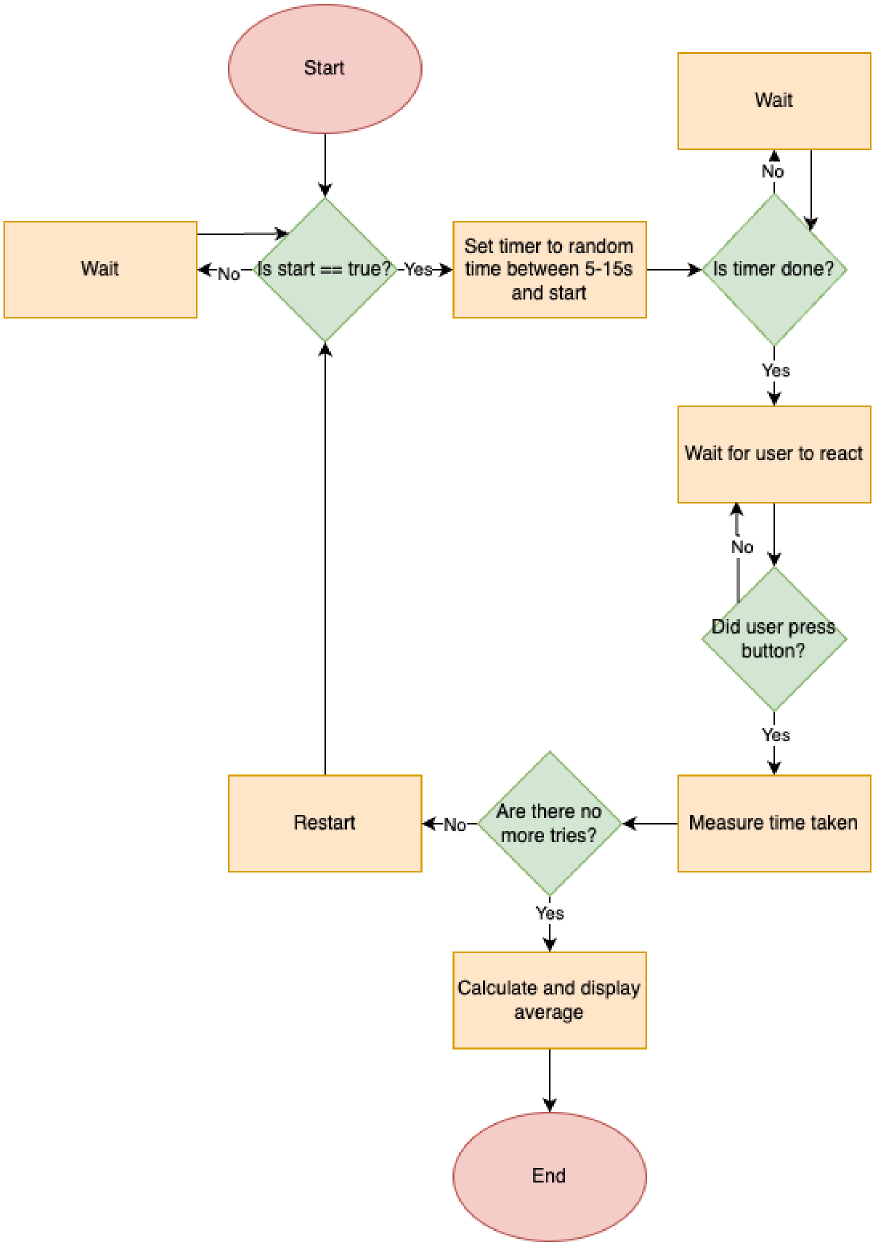


Figure #2: Reaction Time Test System

Figure #2 shows how the reaction time test will work, it waits for the user to start the exercise and then sets a timer for a random amount of time, between 5s and 15s then turns the button red and waits for the user to react to calculate the amount of time taken, this then repeats a total of 5 times then the average is calculated.

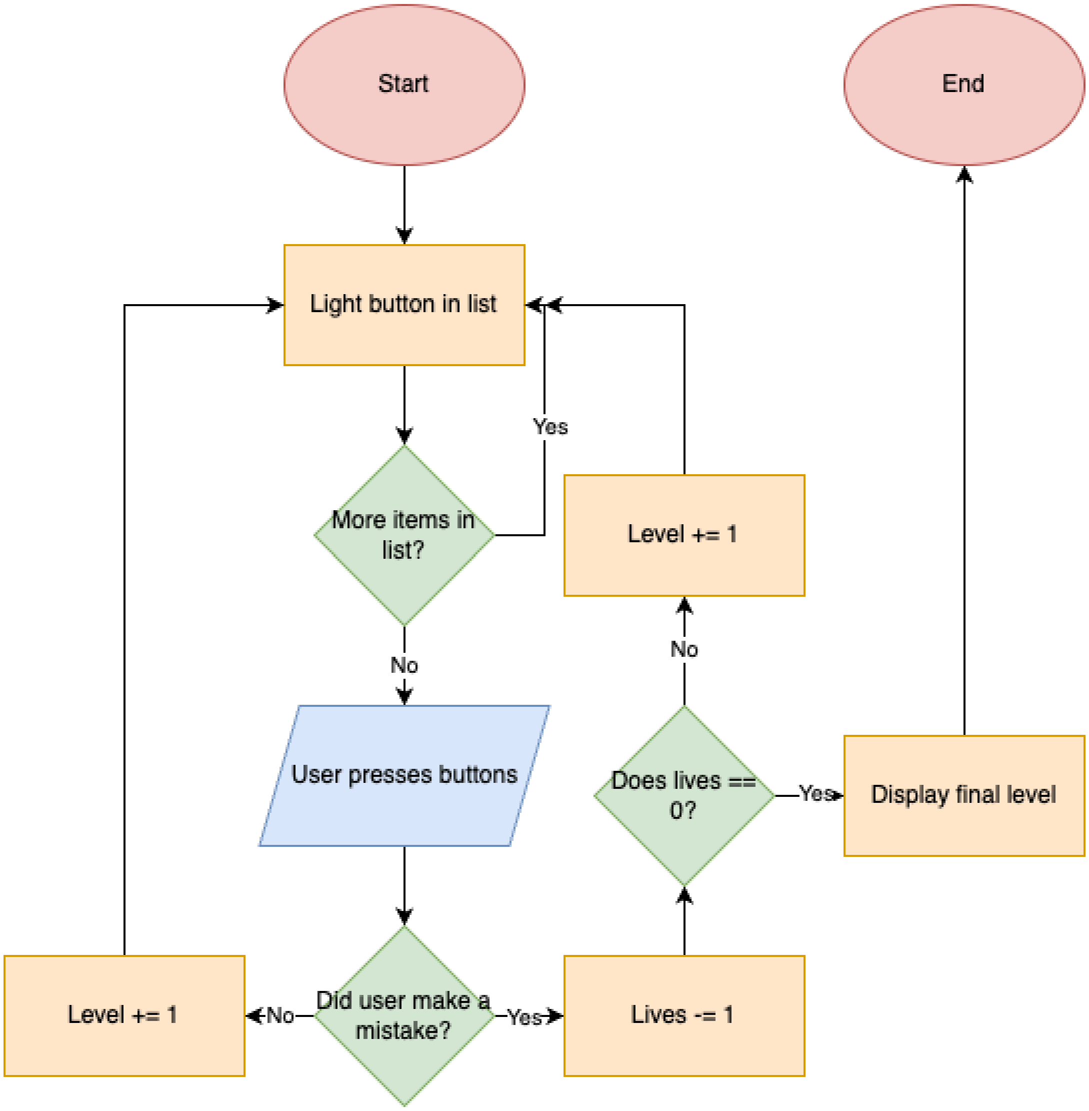


Figure #3: Sequence Memory Test System

Figure #3 shows how the sequence memory test works. When the user starts the exercise one button will light up, and the user must remember what button lighted up. This process continues with the amount of buttons lighting up one after another increasing. When the user runs out of lives the exercise ends and the user’s score is displayed.

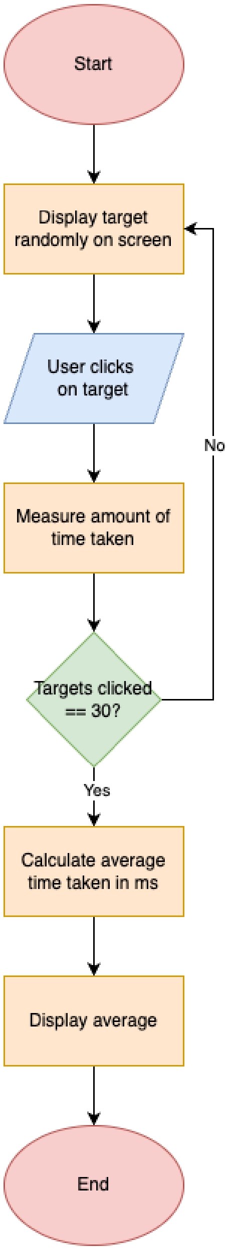

Start
Display target randomly on screen
User clicks on target
Measure amount of time taken
Targets clicked == 30?
No
Yes
Calculate average time taken in ms
Display average
End

Figure #4: Aim Trainer System

Figure #4 shows how the aim trainer exercise will work. When the user starts the exercise a target will appear on the screen and the user has to click on the target as fast as possible, 30 targets will appear in total. Afterward, the average time taken to click on a target will be calculated.

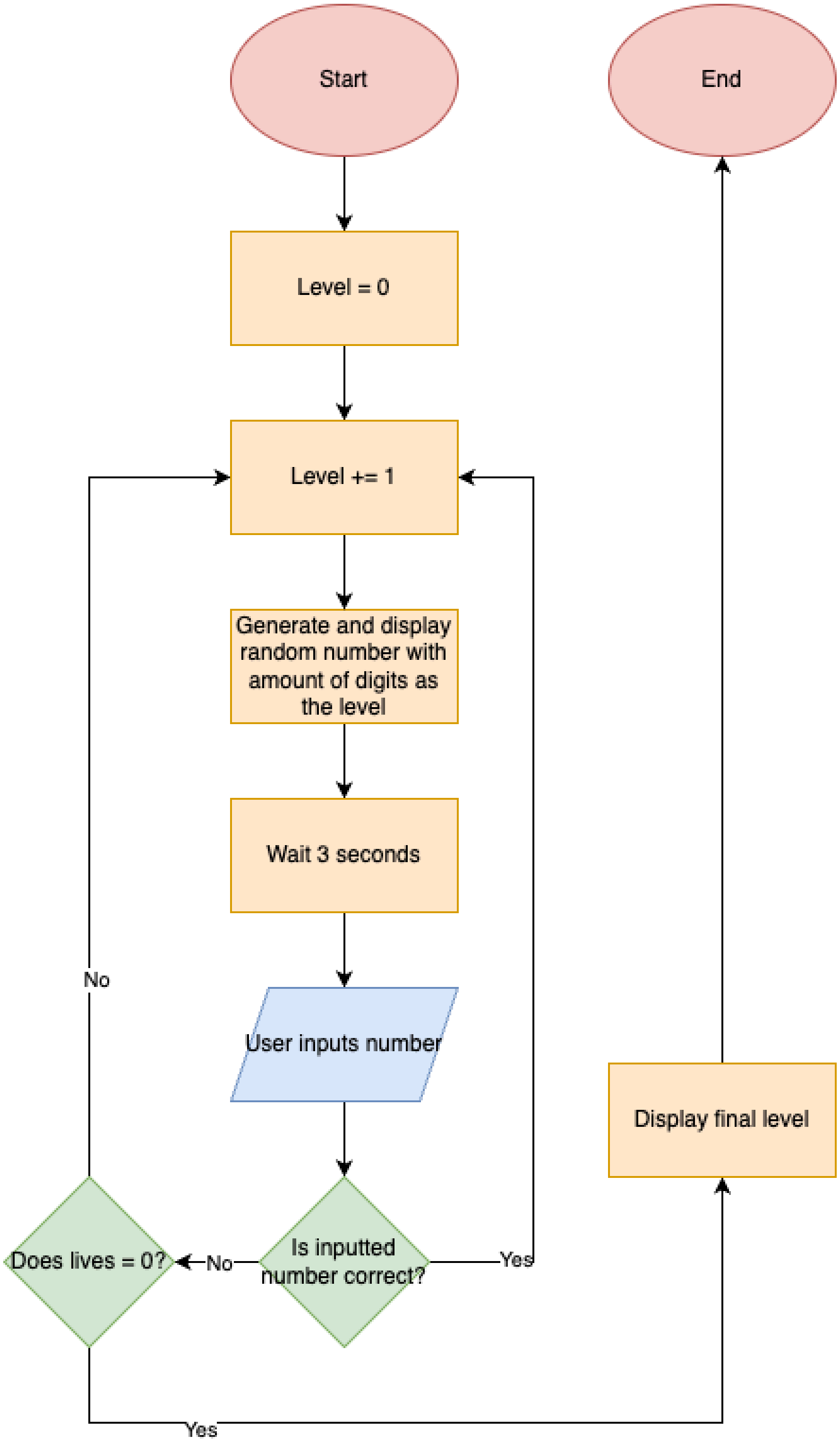


Figure #5: Number Memory Test System

Figure #5 shows how the number memory test will work with the level increasing every time the user inputs the correct number and then displays another number but with one more digit. When lives run out it will display the final level the user got to.

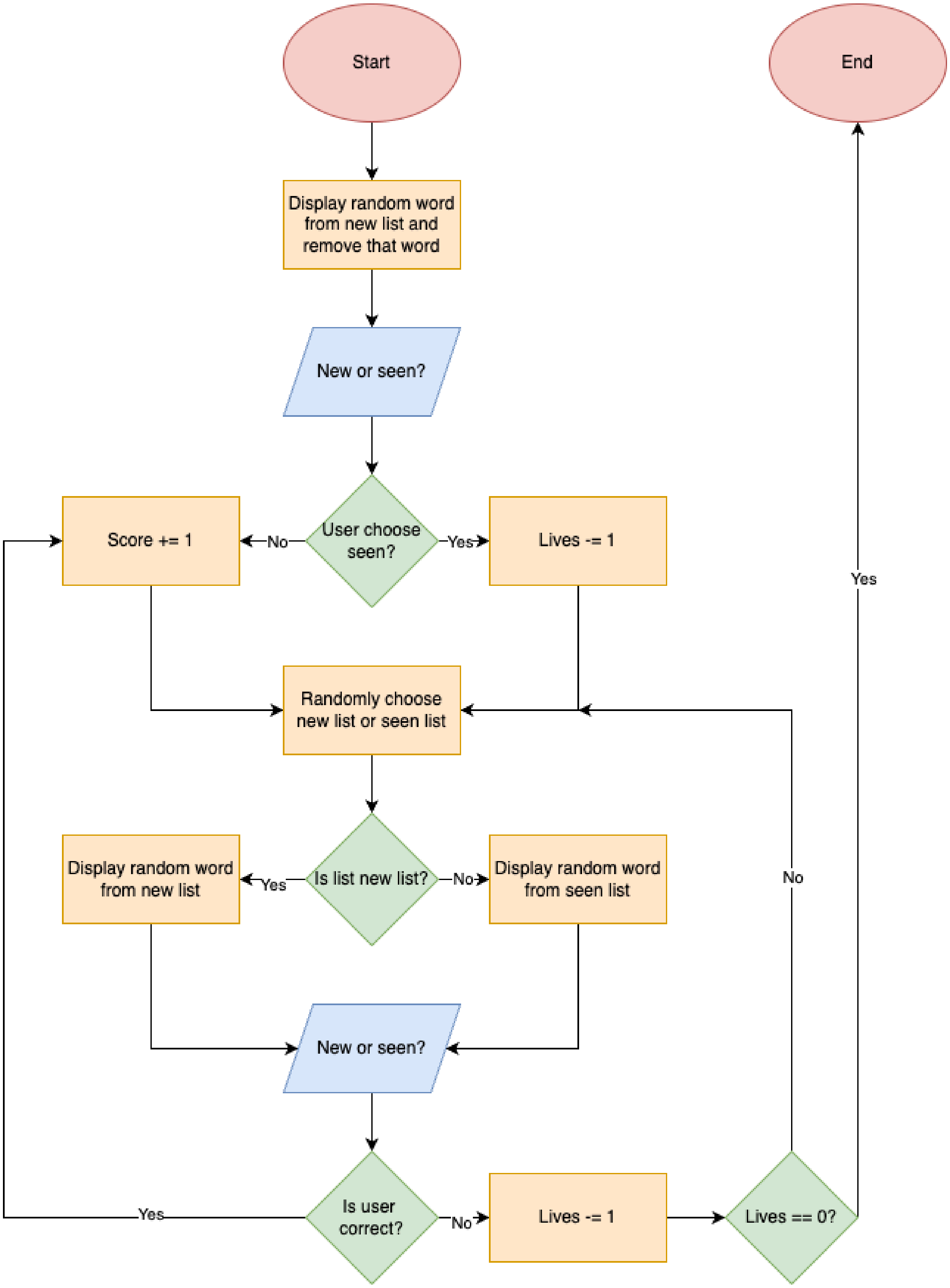

Start
End
Display random word from new list and remove that word
New or seen?
User choose seen?
No
Yes
Score += 1
Lives -= 1
Yes
Randomly choose new list or seen list
Is list new list?
Yes
No
Display random word from new list
Display random word from seen list
No
New or seen?
Is user correct?
Yes
No
Lives -= 1
Lives == 0?

Figure #6: Language Memory Test System

Figure #6 shows how the language memory test will work, randomly selecting a word and the user has to choose if the word was seen already or not. When the user runs out of lives the total amount of correct answers appears.

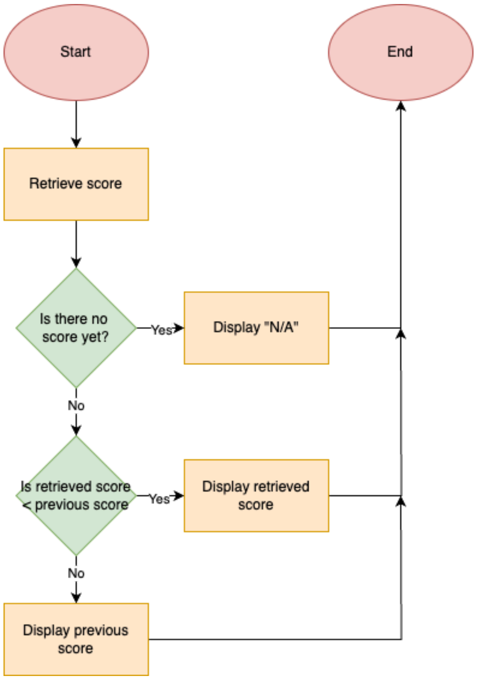


Figure #7: Aim Trainer and Reaction Time Dashboard Updating System

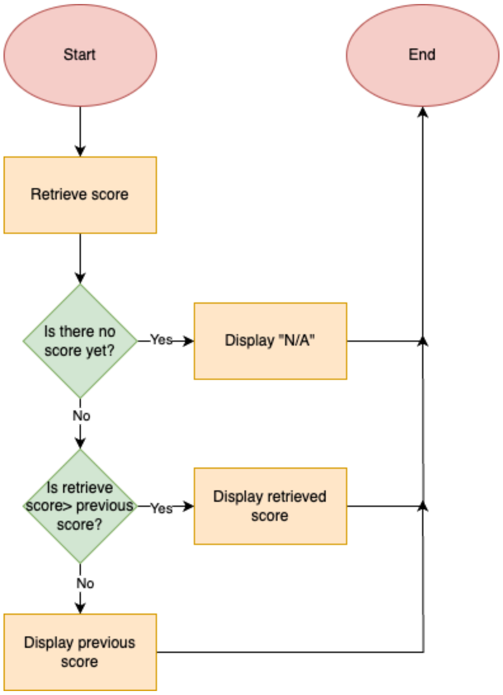


Figure #8: Sequence, Verbal, and Number Memory Dashboard Updating System

Figures #7 and #8 show how the scores will be updated in the dashboard for each exercise. Aim trainer and reaction time tests are separate because the new score has to be lower than the previous for the score to be updated.

Word Count: 336