CS 161 Product Test Plan

Areebah Iqbal
CS 161 - Section 01
Professor Tsao
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Section 1: Feedback from Others

Feedback:

- Gargi: I suggest adding a section on the Game End Screen for users who are playing as a guest, which gives them the option to sign up for an account and save their performance/score.
- Fariha: For the game, maybe you could implement some kind of scoring mechanism so that a user can track how well they do over multiple games.

Section 2: Project Overview and Build Instructions For Testing

Detailed Description of the End Product: Memory Math-o-rama is an educational game designed to improve a user's arithmetic skills, while also improving cognitive thinking skills. Users will answer the arithmetic questions by flipping two tiles. Users will be timed and mistakes will be tallied. If the user is struggling, the user can request for hints or the solution. Users with an account will have additional features, such as viewing game statistics and logging out. On top of that, users with administrative privileges can view all users and delete non-administrative accounts.

Testing Instructions for Expert Users to Carry out the Tests:

- **Building the Frontend:**
    1. Navigate to dev/frontend.
    2. Once in the folder, run npm i.
    3. Then, run npm start.
    4. Go to http://localhost:3000 to interact with the front-end.
- **Building the Backend:**
    1. Navigate to dev/backend.
    2. Once in the folder, install dependencies by running pip3 install -r requirements.txt.
    3. Afterwards, run python3 server.py.
    4. Go to http://localhost:5000 to interact with the back-end.
- Deployment Link Coming Soon

Requirements for Hardware, Software, and/or Password Key:

- **Hardware:** To test the project, the hardware needed is a computer, a mouse or a trackpad, and a keyboard.

- **Software:** To test the project, the software needed is an IDE and a Command Line Interface (CLI). Firstly, the IDE will be used to view the cloned project. Secondly, the CLI will be used to run the commands for installing the dependencies, building the frontend, and building the backend.
- **Password Key:** N/A

Section 3: Automation (Complexity of Testing Instructions)

Time and Effort to Set Up the Test Plan For Execution:

- Cloning the Project, Installing Dependencies, and Starting Project : 10 min. (max)
- Download and Setup for All Testing Tools: 20 min. (max)
- Time for Testing Features: 50 min.
- Time for Backend: 20 min.

Testing Tools:

- Frontend: Frontend
- Backend: Postman

Section 4: Testing Information

Time to Finish the Tests: 60 minutes

Test Cases for Each Feature:

Feature	Description	Test Case(s)	Expected Result	Time	Result
Home Screen	The home screen is essentially the landing page when the user first accesses the game. Users will have the option to play as a guest or play.	Users can view the title of the game. User clicks either Play and Play as Guest.	Firstly, the user should be able to visit the site and view the Memory-Math title. Secondly, the buttons should be clickable and navigate the user accordingly.	< 1 min.	Pass
Click Play	On the home screen, the user has the option to play the game after logging in or signing up.	User clicks the Play button on the home screen.	The user should be navigated to a login screen. If the user doesn't have an account, the user can click Sign Up. The user should be navigated to the Sign Up Page after clicking that.	< 1 min.	Pass
Click Play	On the home	User clicks the	The user should be	< 1 min.	Pass

as Guest	screen, the user has the option to try out the game.	Play as Guest button on the home screen.	navigated to the game screen. There shouldn't be any statistics on the bottom or any Logout button in the corner.		
Sign Up Page	Users can create an account by providing their first name, last name, email, username, and password.	The user leaves one of the form fields blank.	The form doesn't submit and the user is prompted to fill out the empty fields.	1 min.	Pass
		User tries to create a password that doesn't meet the password requirements.	The form doesn't submit and the user is alerted to create a password that fits the requirements.	1 min.	
		User tries to create an account with an already existing username.	The form doesn't submit and the user is alerted that the username is already taken. Instead, the user should input another username.	1 min.	
		User tries to create an account with an existing email.	The form doesn't submit and the user is alerted that the inputted email is already associated with an account.	1 min.	
		User tries to create an account with a valid email, username, and password.	The form is submitted and the user is navigated to the login page.	2 min.	
Logout Feature	Users can log out of the logged in account. The user will be navigated back to the Home Screen.	Users can click the Logout button in the top corner.	The user's session ends. Then, the user is redirected to the Home Screen. The user shouldn't be able to access and perform any unauthenticated content (such as delete accounts, view game statistics, and	< 1 min.	Pass

			more).		
Login Page	Users can login into their account by entering their username and the correct password associated with that username.	User inputs incorrect username.	The form doesn't submit and the user is alerted that an incorrect username or password was entered.	1 min.	Pass
		User inputs incorrect password.	The form doesn't submit and the user is alerted that an incorrect username or password was entered.	1 min.	
		User enters the correct username and password.	The form is submitted and the user is redirected to the game page.	1 min.	
Password Encryption	Before storing a user's password in the database, it will be hashed.	Use Postman to view user information and check if the password data is encrypted.	The password shouldn't be visible in plain text in the database.	< 1 min.	Pass
Admin Privileges	Users with administrative privileges will have the ability to view all users, and change non-admin users to admin, and delete non-admin users.	Administrative user clicks the button View Accounts after logging in (that button is only visible for admins).	The user should be able to view all the accounts, select the non-admin accounts, click the Change User to Admin button, and click the Delete button.	2 min.	Pass
Change User Status	Users with administrative privileges will have the ability to view all users and delete non-admin users.	After navigating to the Accounts Pages, the admin user can select non-admin accounts to update to user status.	The user should be able click the Change User to Admin button. That user should be updated to admin.	1 min.	Pass

Delete Account	Users with administrative privileges will have the ability to delete non-admin users.	After navigating to the Accounts Pages, the admin user can select non-admin accounts to delete.	The user should be able click the Delete Account button. That account should be removed from the database.	1 min.	Pass
Question Generation	Users will get different questions to answer on the top of the tiles.	The user should be able to view the question at the top.	The algorithm should generate a valid question that is solvable by flipping around two tiles.	10 min. (max)	Pass
View Instructions	Users can view the instructions of the game at any time.	The user should be able to view instructions after clicking the How To Play? button.	A modal will pop up with the instructions to the game after clicking the How To Play? button.	1 min. (max)	Pass
View Tiles for Ten Seconds	Users can view the tiles for ten seconds to remember the values.	When the user starts playing, the user should see the tiles for ten seconds.	The game should show all the values for ten seconds and flip them over.	< 1 min.	Pass
Play the Game by Flipping Tiles	Users can play the game by flipping the tiles. Users will have to flip over the correct tiles.	User plays the game by flipping the tiles to answer the arithmetic questions.	The user should be able to interact with the tiles.	10 min. (max)	Pass
		Users select the two tiles that correctly answer the question.	The tiles should flip around, turn green, and remain flipped throughout the entire game. On top of that, they shouldn't be clickable.		
		Users select two tiles that don't correctly answer the question.	The tiles should flip around and then turn back around.		

View Hints	If the user is stuck, the user can request a hint.	User clicks the View Hint button.	All the tiles should flip over for ten seconds, allowing the user to view the values. After, the grid returns to the previous state.	< 1 min.	Pass
Solver	If the user is stuck, the user can get the answer.	User clicks the Solve button.	It will flip over the two tiles that correctly answer the question.	< 1 min.	Pass
Solve and Hint Disabled	The game will disable the solve and hint at some points during the game.	User can't click on either button during the first ten seconds of viewing the tiles	The Hint and Solve button should be unclickable.	3 min.	Pass
		User can't click on the Hint and Solve button when the Hint is happening.	During the ten seconds of viewing the hint, the user can't click on the Hint button again and the Solve button.		
		User can't click on the Hint button when the Solve is happening.	When the Solve button is clicked, the Hint button should become disabled.		
		When there are only two tiles remaining, the Solve is disabled.	The Solve button is disabled when the last two remaining tiles are left.		
Timer	The game will track the amount of the time that the user takes to finish the puzzle.	User starts the game and can view the increasing time in the corner.	It should accurately track the time and display the timer during the game play.	< 1 min.	Pass
Time Penalty	The game gives users a time penalty for using the hint or solve.	User gets a time penalty of five seconds for using the hint.	Five seconds should be added to the timer.	2 min.	Pass

		User gets a time penalty of thirty seconds for using the solve.	Thirty seconds should be added to the timer.		
Mistakes Counter	The game will track the amount of mistakes the user makes during the puzzle.	User makes a mistake and can view the mistake counter in the corner.	User makes a mistake by flipping over incorrect tiles, which results in the mistake counter increasing by one. On top of that, the user should be able view the mistake counter in real-time.	< 1 min.	Pass
Game Statistics	Logged in users will be able to view the shortest time they have taken to complete the puzzle and the lowest number of mistakes they have had when completing the puzzle.	Users can view game statistics at the bottom.	Users should be able to view the game statistics. It should match the information stored in the database.	5 min.	Pass
		If the user performs better than the stored statistic, then it should update accordingly.	On the next game, the user should be able to view the new statistic.		
Game End Screen	Users can view the amount of time they took to finish the game and the amount of mistakes they made during the game after completing the puzzle. Users can also view a Play Again button.	User finishes the game.	The game statistics of the game played should be displayed. If the user made a new record, it should be updated. On top of that, the user can click the button Play Again to start a new game.	2 min.	Pass