

CS 161 Product Test Plan

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CS 161 - Section 01
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Section 1: Feedback from Others

Feedback:

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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.

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: 45 min.
- Time for Backend: TBD

Testing Tools:

- Frontend: PyTest + Selenium
- Backend: Postman

Section 4: Testing Information

Time to Finish the Tests: TBD, since all the features haven't been built.

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 and two buttons: Play and Play as Guest. On top of that, users should be able to click the buttons.	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.	
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.	
Click Play as Guest	On the home screen, the user has the option to try out the game.	User clicks the Play as Guest button on the home screen.	The user should be navigated to the game screen. There shouldn't be any statistics on the bottom or any Logout button in the corner.	< 1 min.	

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.	
		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 that 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.	User can click the Logout button in the top corner.	The user's session ends and 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 more).	< 1 min.	

Login Page	Users can login into 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.	
		User input incorrect password.	The form doesn't submit and the user is alerted that an incorrect username or password was entered.	1 min.	
		User enters 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.	User 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.	
Admin Privileges	Users with administrative privileges will have the ability to view all users and delete non-admin users.	Adminstative 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, and click the Delete Account button.	2 min.	
Delete Account	Users with administrative privileges will have the ability delete non-admin users.	After navigating to the Accounts Pages, the admin user can select one or more non-admin accounts to delete.	The user should be able to select one or more non-admin accounts and click the Delete Account button. Those accounts should be removed from the database.	2 min.	
Question Generation	Users will get different questions	The user should be able to view the question at the	The algorithm should generate a valid question that is	10 min. (max)	

	to answer on the top of the tiles.	top.	solvable by flipping around two tiles.		
Play the Game by Flipping Tiles	Users can play the game by flipping the tiles. It will show all the values for ten seconds and flip over. After that, 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 flip the correct tiles. If the user flips the correct ones, it stays. If the user flips tiles that don't answer the question, it is highlighted red.	10 min. (max)	
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.	
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.	
Timer	The game will track the amount of the time that 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.	
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.	
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	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. On top of that, it should update	1 min.	

	mistakes they have had when completing the puzzle		accordingly.		
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.	