

# CS 161 Product Test Completion

Areebah Iqbal  
CS 161 - Section 01  
Professor Tsao  
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## **Section 1: 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:**

- Use the Deployed Website: <http://aiqbal.pythonanywhere.com/> (Ensure http is being used, since https won't work)

### **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, an IDE and a Command Line Interface (CLI) may be needed. Firstly, the IDE could be used to view the cloned project. Secondly, the CLI could be used for git, installing dependencies, and more.
- **Password Key:** N/A

## **Section 2: Automation (Complexity of Testing Instructions)**

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

- Navigating to the Deployed Website: 1 min. (max)
- Time for Testing Features: 55 min.
- Time for Backend: 1 min. (max) for each API route

### **Testing Tools:**

- Frontend: Use the Deployed Website - <http://aiqbal.pythonanywhere.com/> (Ensure http is being used, since https won't work)
- Backend: Postman

## **Section 3: Testing Information**

**Verify Built and Testing from Others:** Gargi and Fariha

**Time to Finish the Tests: ~65 min.**

### **Test Cases for Each Feature**

#### **Home Page, User Authentication (Login, Sign Up, and Logout), and Nav. Bar Testing**

| <b>Feature</b>      | <b>Description</b>  | <b>Test Case(s)</b>   | <b>Expected Result</b>   | <b>Time</b> | <b>Result</b> |
|---------------------|---|---|--|-------------|---------------|
| 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. Users can click either Play or 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 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.    | Pass          |
| 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   | The form doesn't submit  | 1 min.      |               |

|                |   |   |   |          |      |
|----------------|---|---|---|----------|------|
|                |   | create an account with an already existing username.                        | and the user is alerted that the username is already taken. Instead, the user should input another username.  |          |      |
|                |   | 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.   |      |
| 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.   |      |
| Logout Feature | Users can log out of the logged in account. The user will be navigated back to the Home Screen.                       | User clicks 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 more). | < 1 min. | Pass |

|                                     |  |   |  |          |      |
|-------------------------------------|--|---|--|----------|------|
| Clicking in Sign Up and Login Here! | Users can navigate to the Sign Up Page by clicking the text Sign Up or navigate to the Login Page by clicking the text Login Here! underneath the forms. | User clicks the text Sign Up.   | When the user hovers over the text, it gets underlined. Then when the user clicks, it goes to the Sign Up Page.    | < 1 min. | Pass |
|                                     |  | User clicks the text Login Here!.   | When the user hovers over the text, it gets underlined. Then when the user clicks, it goes to the Login Page Page. |          |      |
| 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 |
| Navigation Bar                      | After clicking Play as Guest or logging in, a navigation bar will appear on the Game Page, allowing the users to navigate to different pages.            | Users click Play Game.  | User is navigated to the Game Page.  | 1 min.   | Pass |
|                                     |  | Logged in users clicks Logout.  | User is logged out and navigated to the Home Screen.   |          |      |
|                                     |  | Admin users clicks Admin Dashboard  | User is navigated to the Admin Dashboard.  |          |      |

### Administrative Privileges Testing:

Before performing these tests, please log into an admin account. To verify you are in a logged in account, please check if the navigation bar has an Admin Dashboard button. If you don't have an admin account and are interested in logging into an admin account, here are credentials for admin account:

- username: admin
- password: 1234

| Feature          | Description               | Test Case(s)                   | Expected Result                                   | Time   | Result |
|------------------|---------------------------|--------------------------------|---|--------|--------|
| Admin Privileges | Users with administrative | Administrative user clicks the | The user should be able to view all the accounts, | 2 min. | Pass   |

|                    |  |  |   |        |      |
|--------------------|--|--|---|--------|------|
|                    | privileges will have the ability to view all users, and change non-admin users to admin, and delete non-admin users. | button Admin Dashboard after logging in (that button is only visible for admins).                              | click the Change to Admin button, and click the Delete button.  |        |      |
| Change User Status | Users with administrative privileges will have the ability to change non-admin users to admin.                       | After navigating to the Admin Dashboard, the admin user can select non-admin accounts to update them to admin. | The user should be able click the Change to Admin button. After clicking the button, an alert will pop-up. If the admin clicks OK, then that user should be updated to admin. If the user clicks CANCEL, the user should remain a non-admin.  | 1 min. | Pass |
| Delete Account     | Users with administrative privileges will have the ability to delete non-admin users.                                | After navigating to the Admin Dashboard, the admin user can select non-admin accounts to delete.               | The user should be able to click the Delete button. After clicking the button, an alert will pop-up. If the admin clicks OK, then that account should be removed from the database. If the user clicks CANCEL, the user shouldn't be deleted. | 1 min. | Pass |

#### Game Testing and User Statistics Testing:

| Feature             | Description   | Test Case(s)   | Expected Result  | Time          | Result |
|---------------------|---|--|--|---------------|--------|
| 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. Basically, it should turn all the tiles green. | 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.         | It will show all the values for ten seconds and flip 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 |
|                                 |  | User selects 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. |               |      |
|                                 |  | User selects 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   | Users can't click on either button during the first                                  | The Hint and Solve button should be unclickable.  | 3 min.        | Pass |

|                  |   |  |   |          |      |
|------------------|---|--|---|----------|------|
|                  | points during the game.   | ten seconds of viewing the tiles.  |   |          |      |
|                  |   | Users 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.   |          |      |
|                  |   | Users can't click on the Hint button when the Solve is happening.          | When the Solve button is clicked, the Hint button should become disabled.   |          |      |
| 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 | 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. | Pass |



|                          |   |   |  |          |      |
|--------------------------|---|---|--|----------|------|
|                          | lowest number of mistakes they have had when completing the puzzle.   |   | accordingly.   |          |      |
| New User Game Statistics | New users will have game blank game statistics.   | Users can view game statistics at the bottom, but it will be blank. | Users should be able to view the game statistics. It should be blank. On top of that, it should update accordingly.  | < 1 min. | Pass |
| 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 |