

### Summary of Test Plan Discussion with Colleagues:

- + Gargi
  - Make sure your landing page describes the game, so that people can understand what the product is about before trying it out.
  - Incentivise users to sign up on the landing page as well, rather than only giving options to play with no account or play as a user.
  - Having navbar options separately also available on the user dashboard may be a little confusing to users; consider one universal navbar across the site.
- + Areebah:
  - Prevent an admin user for deleting other admin accounts
  - It might be helpful to put a range on the numbers, so that users don't put extremely huge or small values

### Testing Instructions for Expert Users:

- + *Deployed link:* <https://digit-sum-graphs.vercel.app>
  - All test cases will be done manually on the deployed site link (listed above).
  - To test the admin account, use these admin account credentials:
    - Username: admin
    - Password: password
  - More instructions are written for each test case.
- + *Requirements for hardware/software/password key:*
  - Hardware: computer/laptop, keyboard, mouse/trackpad
  - Software: N/A

### Automation (Complexity) of Testing Instructions:

- + *Time and effort to set up the test plan for execution:*
  - Setup time for all requirements/testing tools: 10 min (max)
  - Testing time for test cases: ~ 45 min
  - Testing time for backend: 1 min (max) per API route
- + *Testing tools:*
  - Frontend: manually test at deployed link at <https://digit-sum-graphs.vercel.app>
  - Backend: Postman

### Amount of Time to Finish the Tests:

- + *Expected execution time to complete the tests:* ~ 45 min
  - Refer to the 'Expected Time' column in **Test Cases** for the time expected to test specific features.

### Test Cases:

<i>Feature</i>	<i>Description</i>	<i>Test Case(s)</i>	<i>Expected Time (max)</i>	<i>Expected Result</i>	<i>Actual Test Result</i>
Landing page	When users land on the site, they'll be greeted by the home screen. There is a navigation menu at the top where users have the option to log in or go to a game. There is a description of the game, as well as an example of how to play. Users will have the option to 'Play Now!'.	User lands on the landing page.	< 1 min	User should be able to see the navigation menu at the top and the game description, as well as the 'Play Now!' option. All buttons/links should redirect to the correct pages.	Pass/Fail
		User clicks on the 'Play Now!' button.	< 1 min	User is redirected to a Graph Puzzle page.	Pass/Fail
Navigation menu	On each page, users have a navigation menu at the top right corner. From there, they will see links that lead to Home, Login, or Game. If users are logged in, they will also see a Dashboard link, as well as a Logout link.	User selects 'Home'.	< 1 min	User is redirected to the landing page.	Pass/Fail
		User selects 'Game'.	< 1 min	User is redirected to the Game menu, from where they can select a graph puzzle to solve.	Pass/Fail
		User selects 'Login' if they are not logged in.	< 1 min	User is shown the Login modal.	Pass/Fail
		User selects 'Dashboard' if they are logged in.	< 1 min	User is redirected to the dashboard based on whether their user type is admin or user.	Pass/Fail
		User selects 'Log out' if they are logged in.	< 1 min	User is logged out of their account.	Pass/Fail
Login modal	When users click on the navigation menu and then select 'Login', they will be shown the login modal, where they can login to a pre-existing account by providing the correct credentials associated with said account.	User enters an incorrect username.	< 1 min	User is alerted that they entered incorrect credentials	Pass/Fail
		User enters an incorrect password.	< 1 min	User is alerted that they entered incorrect credentials	Pass/Fail
		User enters the correct username and password.	< 1 min	User is logged in. From now on, their game data will be saved and they can access the user dashboard.	Pass/Fail

		<p>User enters the correct username and password and password for an admin account.</p> <p>Admin account credentials: -Username: admin -Password: password</p>	< 1 min	User is logged in. From now on, they can access the admin dashboard.	Pass/Fail
Signup modal	When users click on the navigation menu and then select 'Login' and then 'Create an account' at the bottom of the login modal, they will be shown the signup modal, where they can create an account by inputting a valid username, email, and password.	User leaves one of the form fields blank.	< 1 min	The form doesn't submit. User is prompted to fill out the fields they left incomplete.	Pass/Fail
		User tries to create an account with an already existing username.	1 min	The form doesn't submit. User is alerted that the entered username is associated with another account.	Pass/Fail
		User tries to create an account with an already existing email.	1 min	The form doesn't submit. User is alerted that the entered email is associated with another account.	Pass/Fail
		User tries to create an account with a password that doesn't meet password requirements	1 min	The form doesn't submit. User is alerted to create a password that meets the requirements.	Pass/Fail
		User tries to create an account when both password fields don't match.	1 min	The form doesn't submit. User is alerted that both password fields must match.	Pass/Fail
		User tries to create an account with a valid username, email, and password.	1 min	The form submits. User is logged in. From now on, their game data will be saved and they can access their dashboard.	Pass/Fail
Password hashing	When an account is being created, users' passwords will be hashed before it's stored in the database for security purposes.	Use Postman to test the 'users/add' API route with a body that contains the user_type, as well as a test username, email, and	1 min	The password shouldn't be visible in plaintext in the database or in the 'http://digitsumgraphs.pythonanywhere.com/users/add' API route.	Pass/Fail

		password.			
User authentication	The user's identity will be verified after they login on the Login modal and before they can access certain pages on the site. If authentication fails, the user will be asked to enter their credentials again and they will not be able to go to their dashboard..	User enters the incorrect credentials on the Login page.	1 min	User is alerted they entered incorrect credentials. They will not be able to access their dashboard.	Pass/Fail
		User enters the correct credentials on the Login page.	1 min	User is logged in. They will be able to access their dashboard.	Pass/Fail
Logout	When users click on the navigation menu and then select 'Log out', users can logout of their account.	User selects 'Log out' in the navigation menu.	< 1 min	User is logged out. Their session ends, and they cannot access their dashboard without logging in again.	Pass/Fail
Game menu page	When users click on the navigation menu and then select 'Game', users will be redirected to the graph menu page, where they can choose from many possible puzzles.	User selects a puzzle from the available puzzle links.	< 1 min	User gets redirected to a graph game page, where they will see a puzzle.	Pass/Fail
Game	After selecting a puzzle, user gets redirected to the graph game page. Each puzzle is a diagram of interconnected nodes. User has to type in positive whole numbers in each node such that each node's number is the sum of the digits of all the numbers connected to it. Users are also timed on how long they take to complete the puzzle.	User tries to submit the solution when one/all of the nodes are empty.	< 1 min	User gets an alert warning them that their solution cannot be submitted if it's not valid (all the nodes aren't filled out, or the nodes are filled with invalid values).	Pass/Fail
		User tries to enter an invalid value (a letter/a number that is not a positive whole number between 1 - 99).	< 1 min	The node displays a warning that the input must be a positive integer from 1 - 99.	Pass/Fail
Get solution	If users are stuck on the puzzle, they can click 'Get Solution' to get the solution to the puzzle.	User clicks on the 'Get Solution' option.	< 1 min	User gets the solution for the puzzle.	Pass/Fail

Submit solution	When users are finished filling out all nodes with valid values, they can click 'Submit Solution' to see whether they are correct.	User clicks 'Submit Solution' for an incorrect solution	~ 5 min	User sees a message telling them that their solution is incorrect. They can exit the message to go back to the game, or they can choose between a 'View all graphs' or 'Home' option.	Pass/Fail
		User clicks 'Submit Solution' for a correct solution.	~ 5 min	The timer is stopped. User sees a message telling them their solution is correct. They also see how long it took them to solve the puzzle. They are asked if they want to move on to the next game, to which they can select the 'Yes', 'No', or 'View all graphs' option.	Pass/Fail
Game end modal	After users complete a level, they will see a screen displaying how long it took them to complete the game, as well as options to either continue to the next puzzle or to go to the landing page or game menu.	User clicks on the 'Yes [to proceed to next level]' option.	< 1 min	User is redirected to the next puzzle if it's available; if there're no more puzzles, they're redirected to the game menu page.	Pass/Fail
		User clicks on the 'No [to proceed to next level]' option.	< 1 min	User is redirected to the landing page.	Pass/Fail
		User clicks on the 'View all Graphs' option.	< 1 min	User is redirected to the game menu page.	Pass/Fail
User dashboard	When users click on the navigation menu while they're logged in and then select 'Dashboard', if they are a user, they will be redirected to their dashboard, where they can view their account settings and gameplays.	User lands on their dashboard.	1 min	User sees their account settings, as well as their gameplay history.	Pass/Fail
User gameplays	On their dashboard, users can view their gameplays about the games, which includes the puzzle they	User has not played any games. User goes to the dashboard and views the	< 1 min	User sees a message telling them they have not played any games yet.	Pass/Fail

	solved, the date it was solved, and the time it took to complete the puzzle.	'Gameplays' section.			
		User tries to play a game, but they cannot enter a correct solution. User goes to the dashboard and views the 'Gameplays' section.	Time to attempt a game + < 1 min	User does not see a new game added on to their previous game because they did not successfully complete that game.	Pass/Fail
		User plays a game and finds a correct solution. User goes to the dashboard and views the 'Gameplays' section.	Time to complete a game + < 1 min	User sees a new game in addition to their previous games.	Pass/Fail
Admin dashboard	When admins click on the navigation menu while they're logged in and then select 'Dashboard', if they are an admin, they will be redirected to their dashboard, where they can view their account settings and their admin features such as user account removal and password reset.	Admin lands on their dashboard.	< 1 min	Admin sees their account settings, as well as a list of users where they can execute admin functionalities on.	Pass/Fail
Admin account functionalities	Admins have the ability to see a list of non-admin users on their dashboard. For each user, admins have the ability to a) change their password and b) permanently delete their account.	Admin selects the 'Edit Password' option for a user and enters an invalid password (password is less than 6 characters; passwords don't match).	1 min	The form doesn't submit. Admin is alerted to create a password that meets the requirements.	Pass/Fail
		Admin selects the 'Edit Password' option for a user and enters a valid password.	1 min	The form submits. Admin is alerted that the password change was successful. The user's old password will now not work for them if they try to login in with it.	Pass/Fail
		Admin selects the 'Delete' option for a user. They are warned that the account won't	1 min	The user's account and all the data associated with that account is deleted from the database. The	Pass/Fail

		be able to be accessed again and the action is permanent. Admin confirms their choice.		user will not be able to login with that account again.	
Account settings	Both admins and users can access the Account Settings through their dashboard, where they can view and change their username, email, and/or password. User can also delete their account.	User enters an invalid when changing their username, email, or password.	1 min	The form doesn't submit. User is alerted to input a valid new username/email/password that meets the requirements.	Pass/Fail
		User clicks the 'Edit Username' option.	1 min	If user enters a valid username, their account information will be updated with the new username.	Pass/Fail
		User clicks the 'Edit Email' option.	1 min	If user enters a valid email, their account information will be updated with the new email.	Pass/Fail
		User clicks the 'Edit Password' option.	1 min	If user enters a valid password, their account information will be updated with the new password.	Pass/Fail
		User clicks the 'Delete Account' option. User will be alerted that they are trying to delete their account and that the action will be permanent. User confirms their choice.	1 min	User's account will be deleted, along with all the data that is associated with their account. User will be redirected to the landing page. User will not be able to login with that account again.	Pass/Fail