MathStack User Manual

Welcome to the user manual on our educational game application, MathStack.

To run the application file:

1. Unzip the ZIP file name Mathstack v1.0.zip
2. Ensure both .exe and .pck files are in the same directory
3. Run the .exe file to play
4. Enjoy the game!

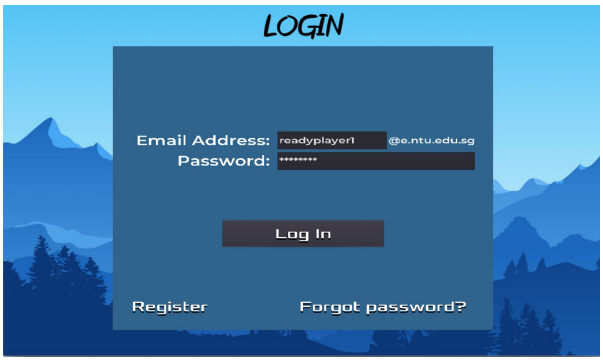
No.	Content
1	Guide for User Accounts
2	Guide for Normal Mode
3	Guide for Challenge Mode
4	Guide for Custom Mode
5	Guide to View Statistics
6	Guide for Managing the Database

Guide for User Accounts

Create an account

1. If you are a new user, you will have to first create a new account to use the application.
2. Select the “Register” button.
3. Enter the following details:
    a. Email address
    b. Password; at least 8 characters
    c. Nickname
    d. Indicate your school
    e. Indicate your class
    f. Full name
4. If you are a teacher, enter **‘T’** in the “For Teachers” field.
5. If you are an administrator, enter **‘A’** in the “For Teachers” field.
6. Select “Create Account”.
7. Account is successfully created, select “Back”.

Login

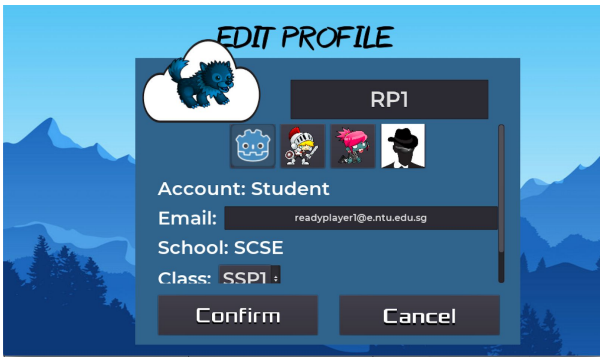


1. If you are an existing user, enter your email address and password.S
2. Select “Login”.
3. You enter the main menu.
4. If you forget your password, select “Forget Password?”, and enter your email address.

	5. Go to your email inbox and enter the link to reset your password.

<u>View and edit profile</u>

Get your own custom profile with your favourite character, profile picture and nickname! Also includes class, school and email address.

	1. You can edit your profile, by selecting “Profile” in the main menu. 2. You can share your profile with any of the social media platforms on the left. 3. To edit, select “Edit”. 4. You can edit on the following: a. Nickname b. Email address c. Class d. Character 5. Select “Confirm” to save your changes.

Guide for Normal Mode

<table>
<tr>
<td>
</td>
<td>1. At the main menu, you may play the Normal Mode to understand and test yourself in the concepts.
2. Upon entering the Normal Mode game mode, the menu below will be shown.
a. You can select a world which are individual topics of the course to begin playing.
b. The progress bar shows your progress for all the worlds.
c. A tick icon is shown for the worlds that you have completed previously.
3. To proceed to a world, select the button on the bottom right corner.</td>
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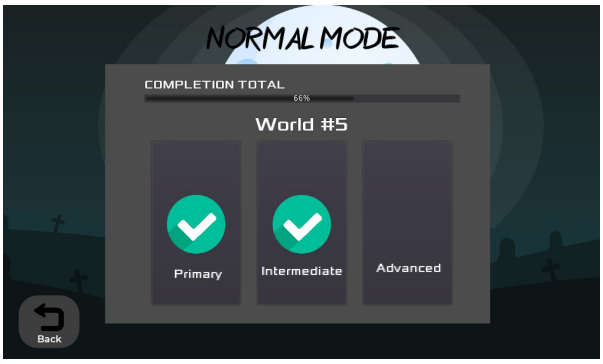
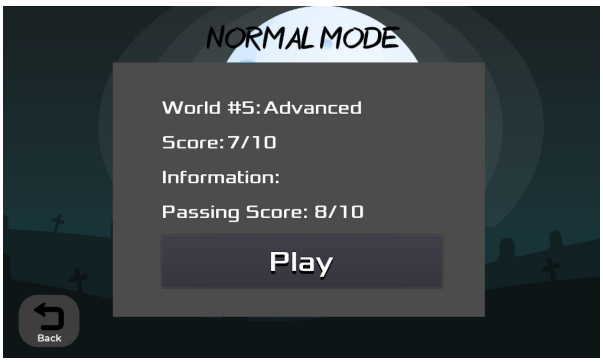
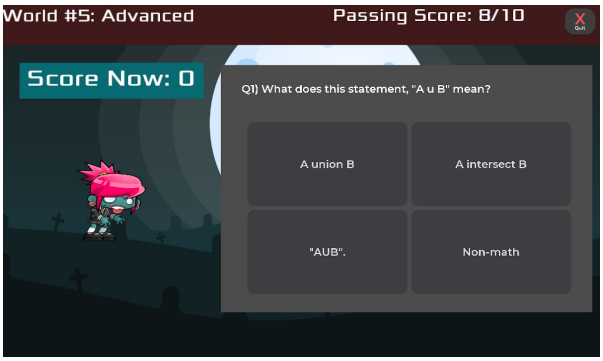
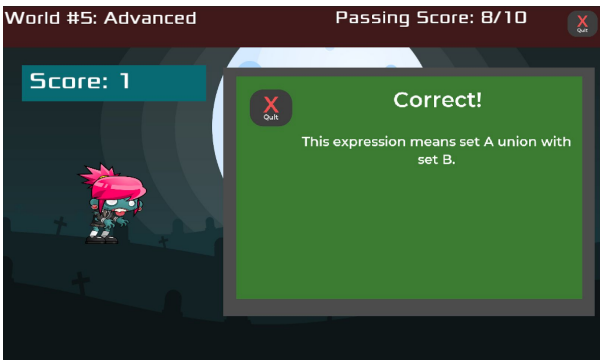
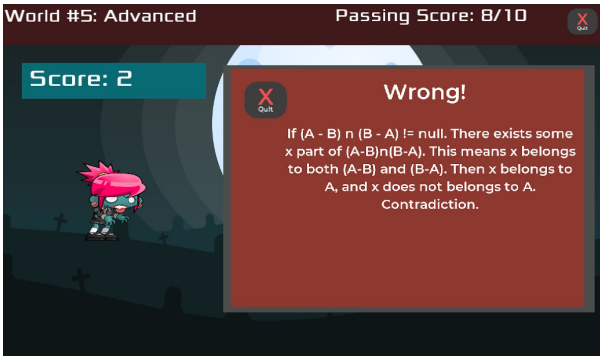
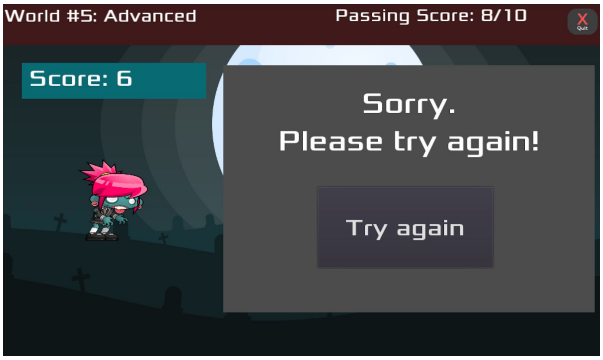
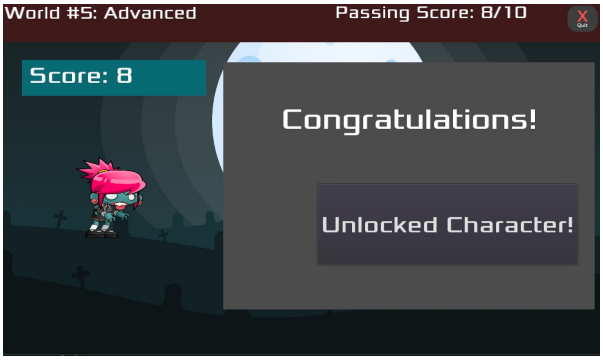
<tr>
<td> 
</td>
<td>4. Upon clicking, the next screen will be shown.
a. Each world consists of 3 levels with increasing difficulty: primary, intermediate and advanced.
b. The level will only be visible if the user has completed the previous level, meaning the user must complete them in sequence.
c. A tick icon represents the levels that have been completed previously.</td>
</tr>
</table>

	5. To continue, choose one of the levels and proceed.
	6. Upon selecting a section, the next screen is shown. a. This is the preview screen before we proceed to the actual game screen. b. This screen shows your high score of all your previous attempts, as well as the passing score. c. In this case, we can see that our high score is 7 and we have to get at least a score of 8 to pass this level. d. Let's go! (Press the Play button!)
	7. This is the actual play screen. a. The character on the left represents the character that we will be able to unlock if we managed to complete this world. b. The right panel represents the question panel, and you have to choose the correct option out of the four options. c. When we choose a correct answer, the score on the top left corner will be incremented by 1.

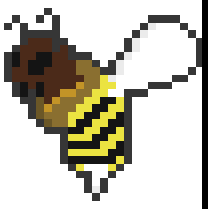
	8. An explanation text is also shown to the user to further explain the answer to the user as shown below.
	9. If we choose a wrong option, the following screen will be shown instead
	10. If we complete the quiz of 10 questions with a score that is less than the passing score, the following screen is shown.

	11. If we complete the quiz of 10 questions with a score that is equal to or more than the passing score, the following screen is shown
	12. Let's unlock our character! Upon pressing the button, the following screen will be shown to congratulate the user on unlocking the character.
	13. The unlocked characters can then be used in other game modes! Now that the user has completed World #5, the normal mode main menu will be updated to show the latest progress.

Character Unlock List

You may refer to this list for all the characters that can be unlocked with normal mode. These characters will be used in the challenge mode, as it is accompanied by power-ups!

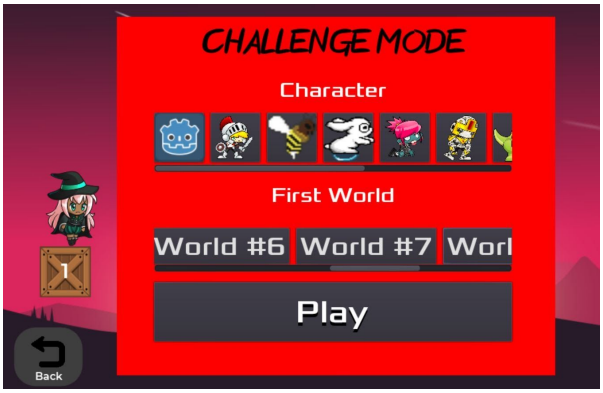
<u>Playable Characters</u>

Characters	Powers	Image	Unlock
Godog	None		Default
Swee Soldier	**Steel Heart**: Add 2 lives		World #1
Mister I	**MIA**: Jump 3 levels		World #2
Humble B	**Humble Bundle:** Randomize question (5 uses)		World #3
Rider Rabbit	**Fast & Steady**: Slow timer by 1/2 speed for 30 real seconds		World #4

Fire Fox	**Fatal Furry:** Randomly activates another powers		World #8
Zesty Zombie	**Munch Munch:** Sacrifice 1 life for 5 levels		World #5
Deadly Dino	**Double Damage:** For 15 seconds x2 damage. (i.e. answering questions will result to twice the score gained or twice the health lost)		World #7
Careful Cyborg	**Calculating:** Reduce time spent by 30 seconds		World #6
Witty Witch	**Worry Not:** Sacrifice 1 life for 100 seconds time reduction		World #9
Ticky Troll	**Timely Tongue:** Add 4 lives but spend additional 2 minutes		World #10

Guide for Challenge Mode

The goal of the game is to test the users' mastery over the entire subject of the course. Experience the fun through games and competitive elements.

<table>
<tr>
<td>


Challenge Mode Selection Screen
</td>
<td>
1. From the play menu, select "Challenge" to enter the Challenge Mode.
2. The features of the mode include:
    a. Health-Point Systems
    b. Power Activation
    c. Climb the Ladder Gameplay
    d. Competitive Leaderboard
    e. Cool Characters
    f. Awesome Background and Music!
</td>
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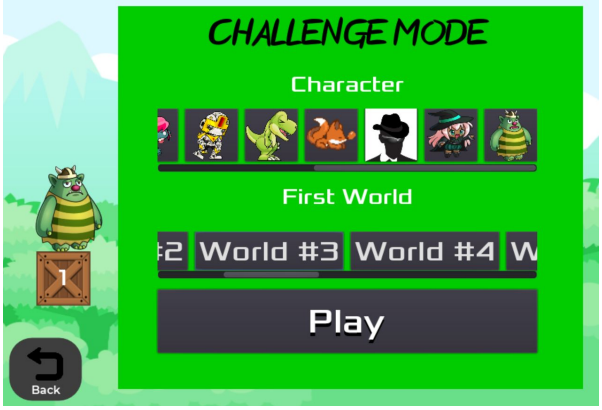
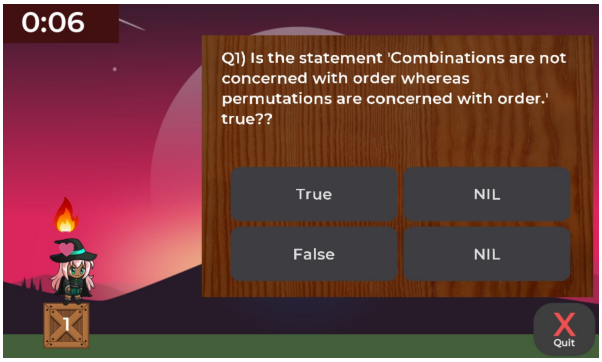
<tr>
<td>


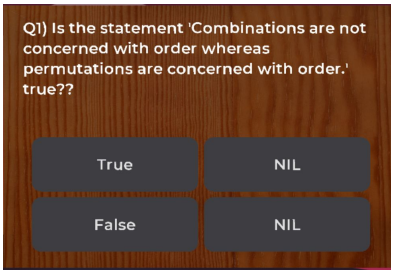
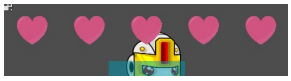
Different Selection of Character and World
</td>
<td>
3. Upon entering Challenge Mode comes…
4. In this screen, you will need to do the following:
    a. Select Character[1]
    b. Select Starting World[2]
    c. PLAY (click on it to start)
</td>
</tr>
</table>

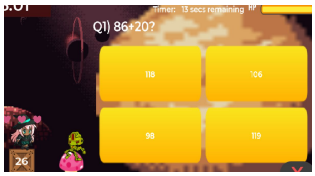
[1] Note that some character icons are locked since students are required to unlock them (via playing through normal mode)
[2] Changing worlds will change the background and music accordingly.



Challenge Mode Play Screen

Features

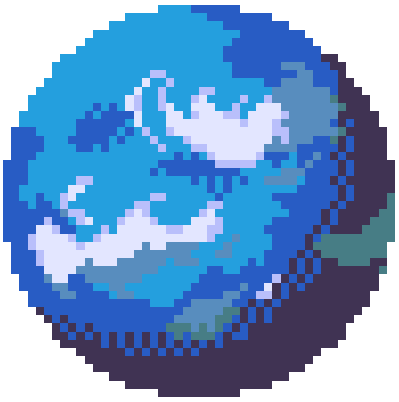
			
Question Board - Clicking on the options will indicate if choices are correct - Randomizes each time - Answering wrongly reduces the player health by 1	**Powerup Button** - Activates unique character powers when clicked! - Restores every two minutes or after beating a boss - See more information in the character cheat sheet above	**Healthbar** - Indicates how much health does the player has - When there are 0 hearts, the player automatically loses - Max hearts to hold is 5	**Blocks** - Building blocks of the game - More blocks indicated in the number means higher score - When the game ends, the number of the block will be recorded as the score

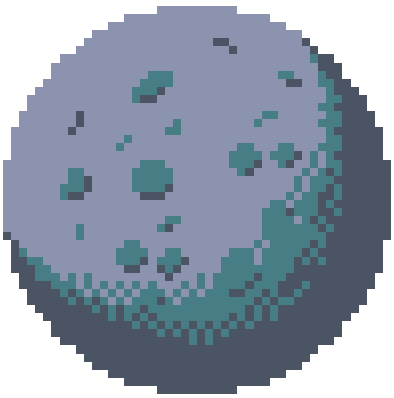
			
Timer - Shows time elapsed during gameplay	**Speech Bubble** - Shows the character's speech - Sometimes indicates the power used, whether an answer is right or wrong	**Select New World** - Happens every 10 levels - Allows user to pick a different world from those indicated	**Boss Fights** - Happens every 25 levels (total 4 bosses[3]) - Timer will pause for 15 seconds - Answering questions correctly will damage the boss while wrongly will speed up the time left - Beating the boss[4] gives the player an additional health and restores their power - Failing to beat the boss within the time period reduces a health instead

[3] See list of available bosses below

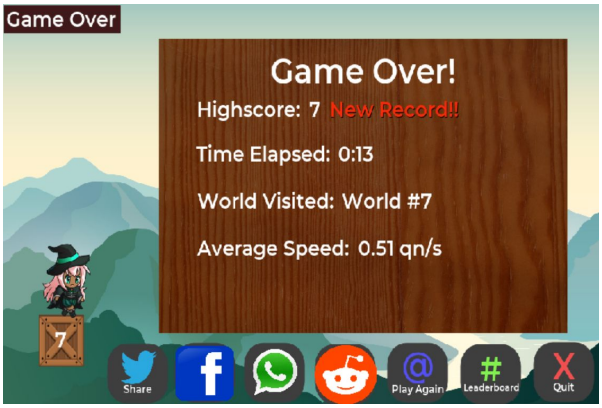
[4] Means when the hp value of the boss reaches 0, as indicated in the healthbar of the top left corner of the screen

List of Available Bosses

Bosses	Planet/Background	Levels
Goldminator	*Lython*	25
Seaplusplus	 Cshark	50
Burnbie	Lavascript	75

 Darknight	 GoDam	100

Gameover[5]

 *Gameover Screen*	To achieve gameover, do either: 1. Complete all 100 levels of challenge mode 2. Quit in between gameplay 3. Run out of health 4. Jump off the tower Data Saved: - Highscore[6] - Time Elapsed - Character Used

[5] Also the end of game play for challenge mode
[6] Only if its a new record

Features

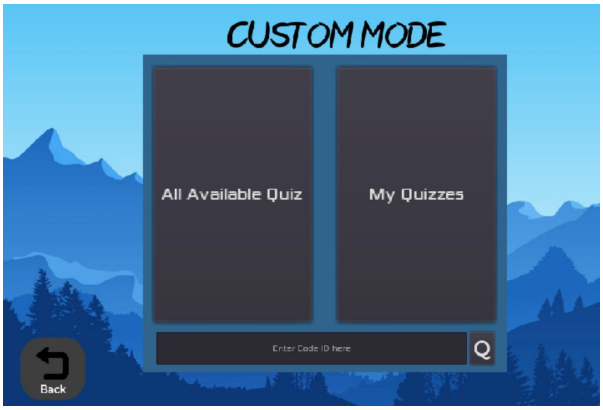
<u>Social Media Buttons</u> - Click on any of them will share a message with all the relevant information on the respective platforms	**<u>Play Again Button</u>** - Allows users to play the quiz again[7].	**<u>Leaderboard Button</u>** - Brings users to view the leaderboard screen

[7] The quiz will start with the world the user last played.

Guide for Custom Mode

Create your own custom quiz or play against your friends! Create any quiz of your desire and share with your friends.

Searching/Choosing Custom Quiz

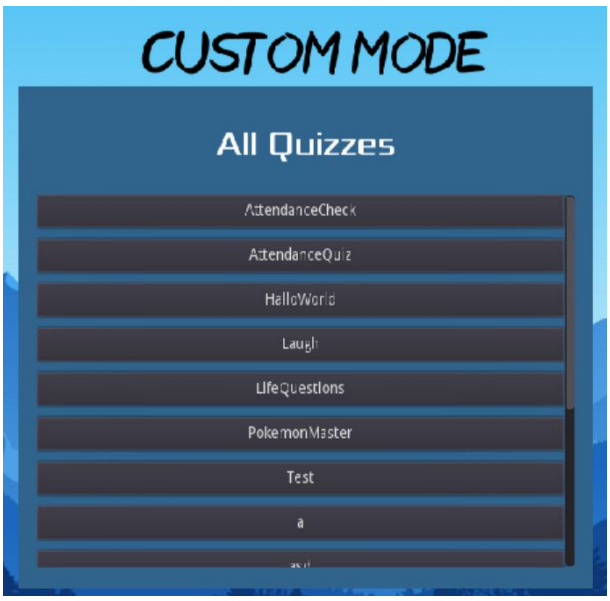


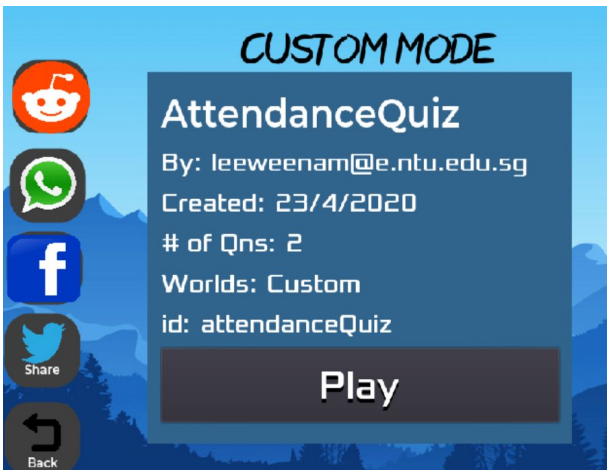
Custom Mode Selection Screen

From the Play Menu, select Custom Mode. Users will be brought to the Custom Mode Selection Screen.

Has three main functions/features:

1. All Available Quiz
2. My Quizzes
3. Search Custom Quiz

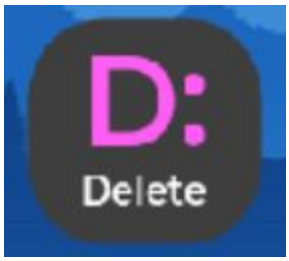
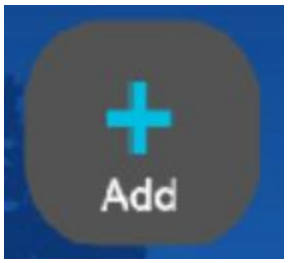
 *All Available Quiz Scene*	**Method 1: Clicking All Available Quiz Button** 1. Brings users to the all available quiz scene 2. Shows the list of quiz available in the database 3. Allows users to click on each individual quiz
 Custom Mode My Quizzes Scene	**Method 2: Clicking My Quizzes Button** 1. Brings users to the my quizzes scene 2. Shows the list of quiz made by the user available in the database 3. Allows users to click on each individual quiz 4. Allows users to add new quizzes

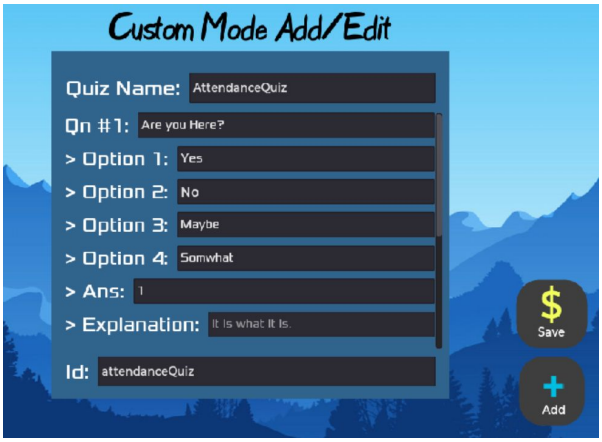
 *Custom Mode Preview Scene*	**Method 1/2: Click on a quiz in the list** **[Alt] Method 3: Search Quiz by ID** 1. Brings the user to the Custom Mode Preview Scene 2. Display information about the custom quiz; including its title, creation date, number of total quizzes, worlds used and id 3. Allows quiz information to be shared by social media 4. If the quiz belongs to the user, they can edit or delete directly from it

Managing Custom Quiz

All users have access to their own custom quiz, giving them powerful access to create, edit or even delete these quizzes. This only works if the user owns the quiz.

<u>Features</u>

 **<u>Delete Button</u>** Deletes the target quiz	 **<u>Edit Button</u>** Edits the target quiz	 **<u>Add Button</u>** Adds a new quiz

 *Custom Mode Edit Screen*	Adding or Editing a quiz will bring you to this scene. - Allows user to make custom quiz content - Include explanations - Unique quiz id[8] Features: 1. Add Button (Adds more questions to the quiz) 2. Save Button (Saves the quiz to the database)

Playing Custom Mode

It has the same gameplay and mechanics as Challenge Mode, with only a fixed set of questions. It is a downscaled version of challenge mode (and without boss fights)

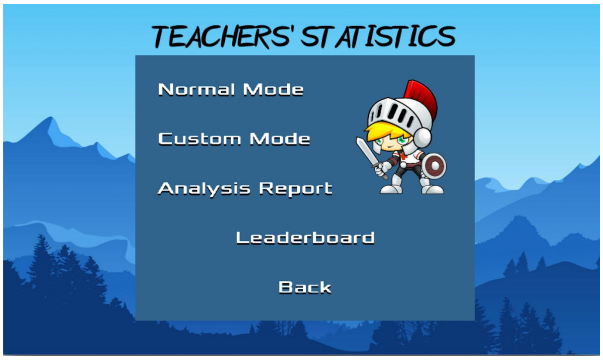
 Custom Mode Gameplay	Clicking the Play button will start the game. - The game ends when all questions have been answered. - The user is brought to the same gameover screen as in the one in Challenge Mode. - The scores will be saved and viewable only in the statistics

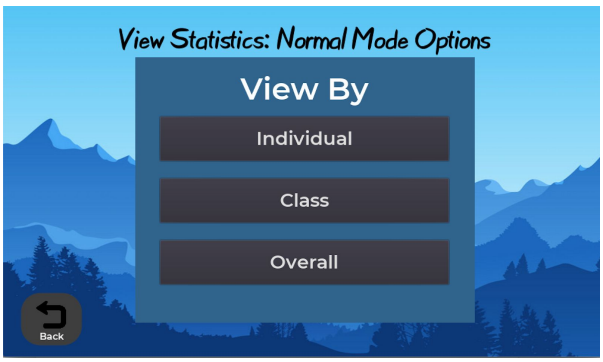
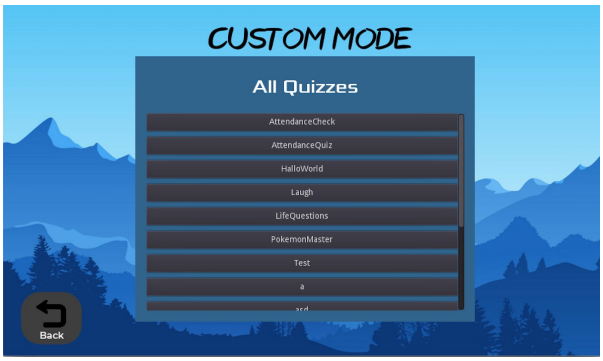
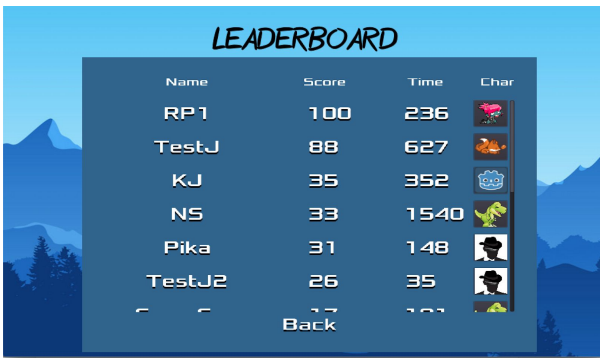
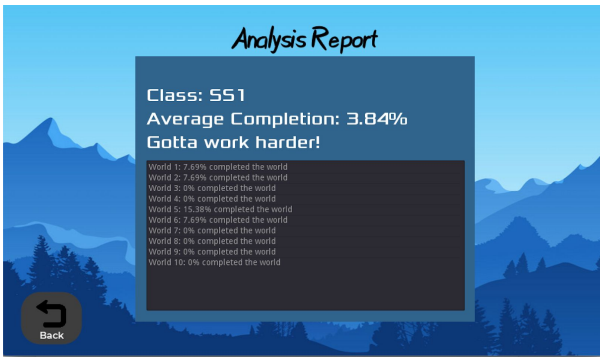
[8] Has to be unique and doesn't contain invalid characters

Guide to View Statistics

Note that this feature is for teachers only.

Allows teachers to view statistics of their class and individual students. Include progress of their normal mode clearance, challenge mode highscores and even an analysis report!

	1. This feature allows the teachers to view statistical data of the class performance. 2. From the main menu, select “Statistics” to view the statistics.
	3. The user can see 3 groups of statistics, namely: a. Normal Mode b. Custom Mode c. Analysis Report d. Challenge Mode Leaderboard 4. Select the “Normal Mode” option to view students’ performance in the Normal Mode. 5. Select the “Custom Mode” option to view the performance in Custom Mode. 6. Select the “Analysis Report” option to view the summarised report in Normal Mode. 7. Select the “Leaderboard” option to view the Challenge Mode leaderboards.

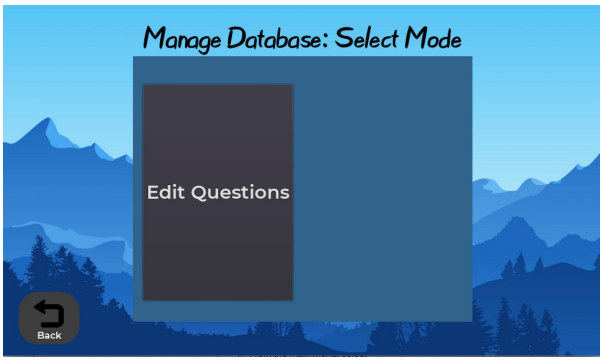
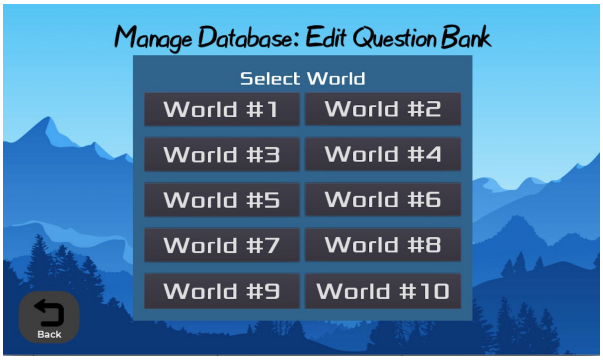
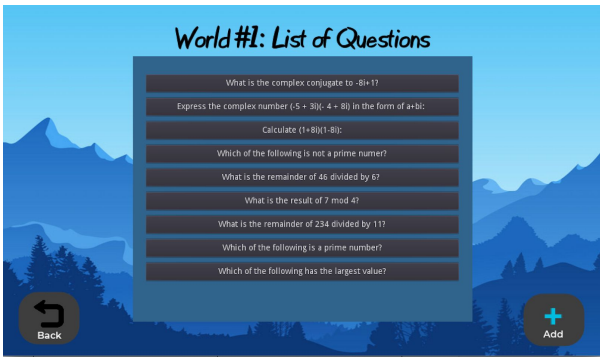
	8. Under the Normal Mode statistics, the user can view the statistics by student, class and course. 9. Select “Individual” to view by student. 10. Select “Class” to view by class. 11. Select “Overall” to view by course.
	12. Under the Custom Mode statistics, the user can view the statistics for each custom quiz. 13. Select the quiz to view the statistic.
	14. The user can see the leaderboard from the Challenge Mode.
	15. The user can see the Analysis Report from the Normal Mode.

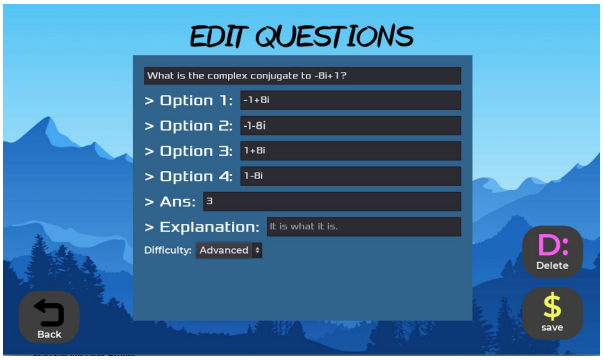
Guide for Managing the Database

<u>Manage the Question Bank</u>

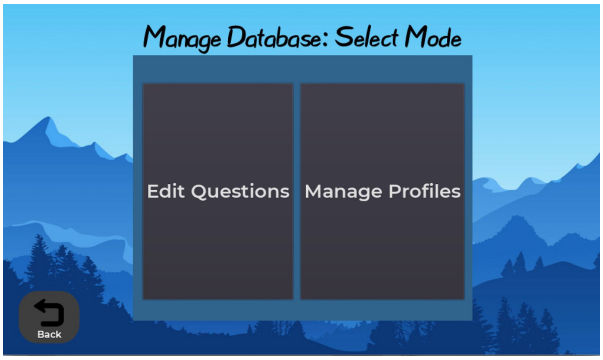
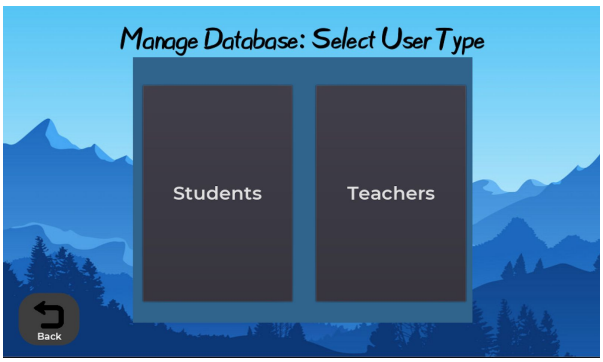
Note that this feature is for teachers only.

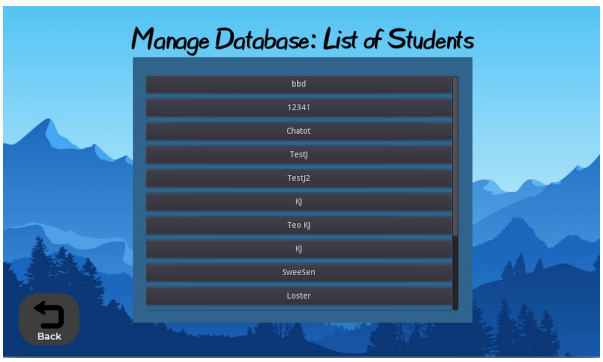
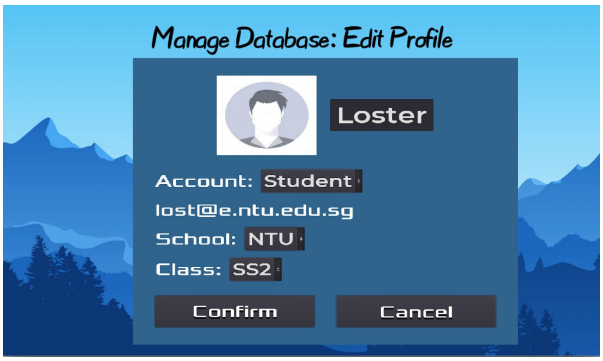
Rather than editing from FireBase (our database), teachers can also use the game interface to add, edit or delete questions in normal mode.

	1. From the main menu, select “Manage Database”. 2. To edit the Question Bank, select “Edit Questions”.
	3. The user can select from the list of Challenge Mode worlds to edit the question.
	4. Selecting the world provides the user with the list of available questions.

	5. The user can edit the question text, answer options, correct answer and explanation fields.

<u>Manage the User Profile</u>

	1. From the main menu, select “Manage Database”. 2. To edit the Question Bank, select “Manage Database”.
	3. The user can choose to edit a student or teacher account, by selecting the relevant option respectively.

	4. By selecting “Student” or “Teacher”, the list of available users are shown.
	5. The user may edit the following details of the user. a. Nickname b. Account type c. School d. Class