

Tātai!

User Manual

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Contents

Welcome to Tātai!	3
Running the Jar	4
Login.....	5
Main Menu.....	6
Level Select	7
Statistics	9
Game Mechanics.....	11
Users	15
Data	17
Skill Levels	18
Key Bindings	18

Welcome to Tātai!

Tātai is an interactive application aimed at improving a user's ability in pronouncing Māori numbers, as well as improving confidence with basic mathematical skills in a Māori learning context.

The application supports voice recognition software which listens to the user as they speak, and gives feedback on the accuracy of their pronunciation. Users can play a range of game modes to build their confidence, and can see a track record of their learning and improvement through tracked user statistics. Teachers can input custom question lists focusing on specific parts of a student's learning.

We hope you enjoy the Tātai prototype!

Target Audience: 7-10 year olds who are first language speakers of Māori, and will use the aid to improve their maths.

Regards,

Nathan Cairns

Buster Darragh-Major

Running the Jar

Tātai is built to be run on Ubuntu, Linux. Before running ensure you have Java8 with JavaFX installed. To install JavaFX:

- 1) Open up a terminal by pressing:

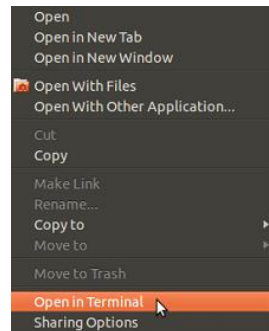
```
ctrl + alt + t
```

- 2) Type the following:

```
sudo apt install openjfx
```

Run From the Command Line

After the requirements are met you are ready to run the prototype! Open up another terminal window by using the previous shortcut, and navigate to the TataiApp directory. An alternative is to find the TataiApp directory in a file explorer of your choice, right-click and select “Open in Terminal”. Before running, ensure the directory “TataiData” is located in the same directory as Tatai.jar when running.



With the terminal open, type the following command:

```
java -jar Tatai.jar
```

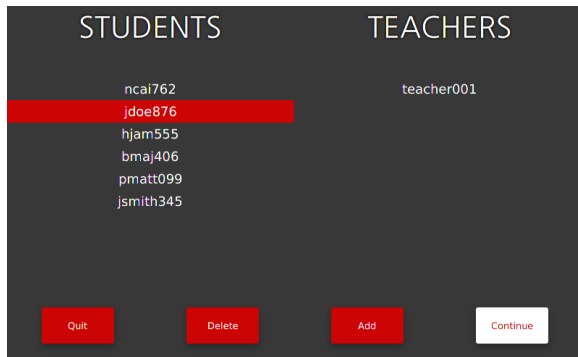
Run by Double Clicking

The Tātai jar can also be run by double click. To do this, move the “TataiData” folder to the home directory of the Linux machine, (called /~). Once the folder is there, Tātai can be run by double-clicking Tatai.jar.

Login

When first opening the application Tātai will display a login screen with a list of registered student and teacher users. If no users have been created both lists will be blank. The user has four button options; “Quit”, “Delete”, “Add” and “Continue”. Pressing “Quit” will exit the application. Pressing “Delete” will prompt the user with a confirmation before deleting

the selected user in the list. If no users are selected the application will not respond with any action. Pressing “Add” will take the user to a new user form, where the first, last, username and teacher privileges for the new user

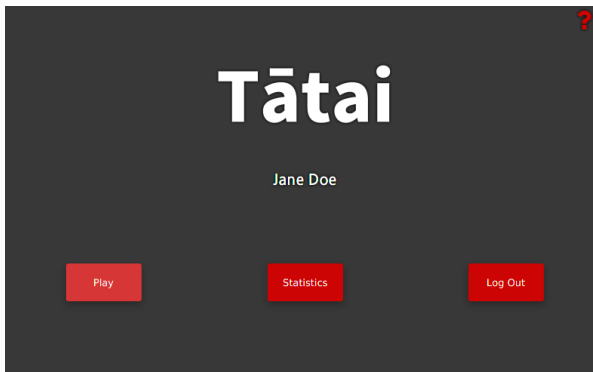


Login Window

can be entered and confirmed. On creation the new user will appear in their respective list on the login screen. Finally, pressing “Continue” while a user in one of the lists is highlighted will login as that user and move forward to the application home screen. Double clicking an element in either list will have the same effect as pressing “Continue”.

Main Menu

The application home screen shows the full name of the user logged in, and along the bottom shows buttons labelled “Play”, “Statistics” and “Logout”. Pressing “Logout” will log the user out, and return to the login screen. Pressing “Statistics” takes the user to the statistics view. Pressing



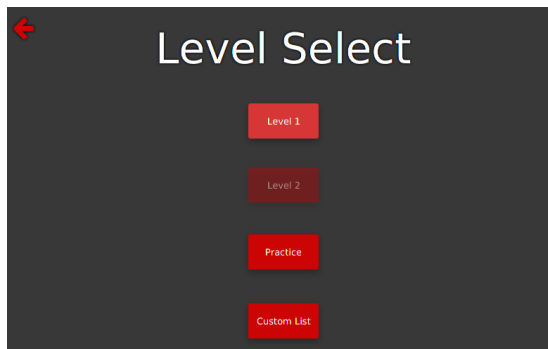
“Play” Takes the user to the Level Select view. In addition to these buttons there is a further question mark icon in the top right corner of the window. Pressing this will show the user a brief tutorial of how gameplay

Main Menu

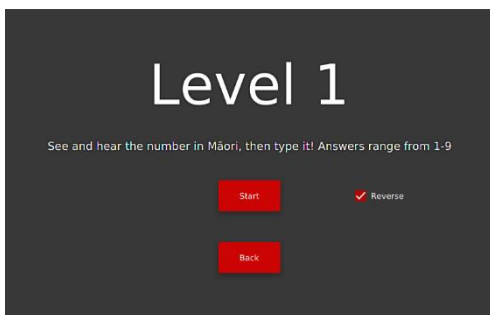
works. Furthermore, if a teacher user is signed in a pencil icon will show in the top left of the window. Pressing this will take the user to the teachers editing suite.

Level Select

The level select menu offers a list of all possible game types available to the user. The options presented to the user are as follows: “Level 1”, “Level 2”, “Practice”, “Custom List”. Pressing Level 1 or level 2 will take the user to a level



Level Select Window

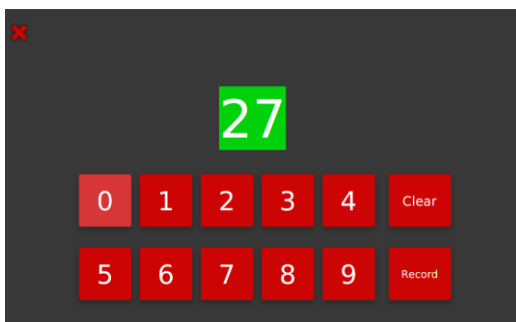


Level Selection Confirmation Window

window, where they can type numbers either through the on-screen or a native keyboard, and then press record, say the number and are given feedback on their pronunciation. This window is designed to aid with learning the pronunciation of any Māori number the user likes.

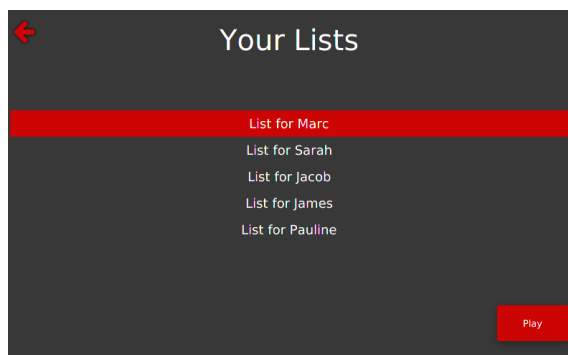
confirmation window, where a brief description of the game type is displayed, and an option to switch the game mode to “reverse” mode is present by pressing a check box. Once regular or reverse is decided a user can begin the game by pressing start.

Pressing “Practice” will take the user to a practice



Practice Game Mode

Pressing “Custom List” will take the user to a window where they will see a list of their current custom question lists. If none exist, then a warning message is displayed. A user can select a custom list from the list, and then press play where they will be taken to a game loaded with the custom questions.



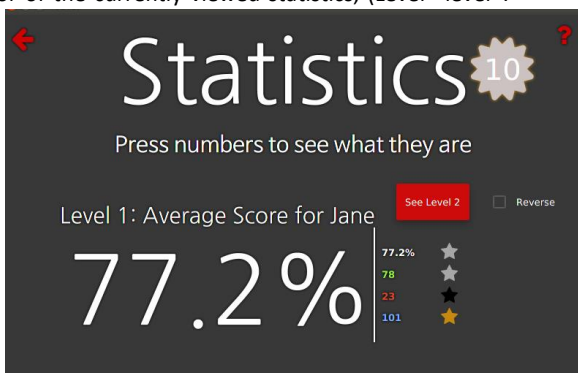
Custom List Selection

Statistics

The statistics window shows a graphic of the user's base statistics. Statistics are tracked for game modes: Level 1, Level 1 Reverse, Level 2, Level 2 Reverse. Note that statistics are not tracked for practice or custom list modes. Level 1 statistics are loaded on-screen by default. Below the statistics header, is the descriptor of the currently viewed statistics, (Level <level>:

Average score for <user>). Below this is the statistics data, and to the left of this are four coloured numbers

representing further data the application has tracked from game play. Clicking on these shows further detail on the number, included

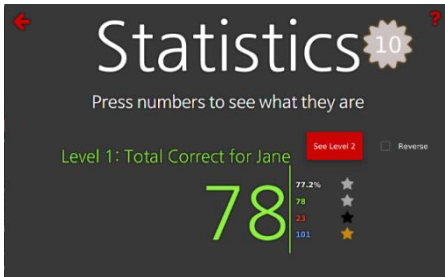


User Statistics Window

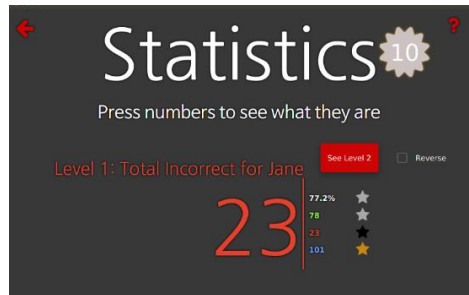
are: Average Correct, Total Correct, Total Incorrect and Total Answered. The users high score for each game mode is also shown to the left of the window header. The star icons to the right of the statistics in the window pertain to a certain level of achievement for that statistic. These levels are fully explained in the achievements section.

Furthermore, there is a button in the top right corner of the window which takes the user to a statistics help window, which fully explains each achievement level in detail.

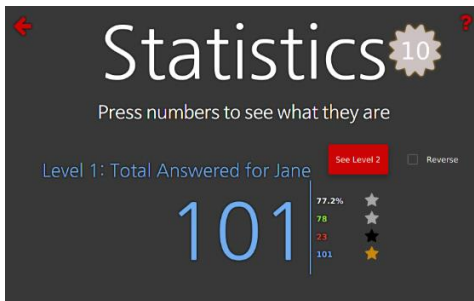
On the next page a selection of sample statistics are shown:



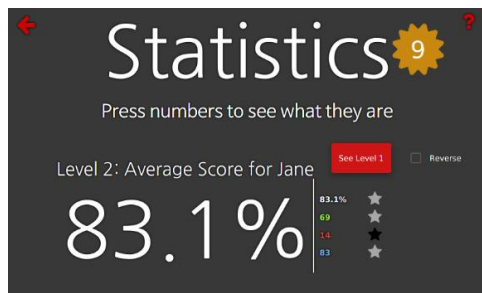
Statistics - Total Correct



Statistics - Total Incorrect



Statistics - Total Answered



Statistics - Level 2

Game Mechanics

There are two basic game types in the Tātai application: verbal recognition (equation mode), supported by level 1, level 2 and custom list. Typed number recognition (reverse mode), is supported by level 1 reverse and level 2 reverse. The game modes are as follows:

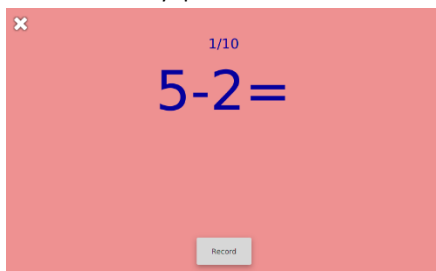
Level 1: Test your maths with addition and subtraction questions, answers ranging from 1-9.

Level 1 Reverse: See and hear the number in Māori, then type it! Answers range from 1-9.

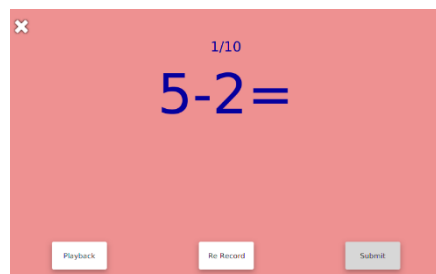
Level 2: Test your maths with addition, subtraction, multiplication and division questions, answers might range from 1-99.

Level 2 Reverse: See the number in Māori, then type it! Answers range from 1-99.

Custom List: Play questions from a custom list input by your teacher.



Equation Game - Hit Record!

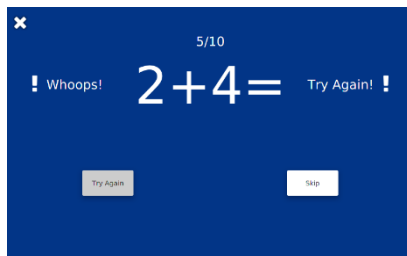


Equation Game – Re-listen, re-record or playback!

An equation game works by showing the user a mathematical equation, and the user has the option to record themselves saying the answer to the question as a Māori number. When recorded, the user can: “Playback”, “Rerecord” or “Submit”. Pressing playback will play the users recording back to them. If the user wishes to re-record their answer, pressing re-record will overwrite the current recording to be submitted for analysis. Pressing “Submit” submits the recording to the program

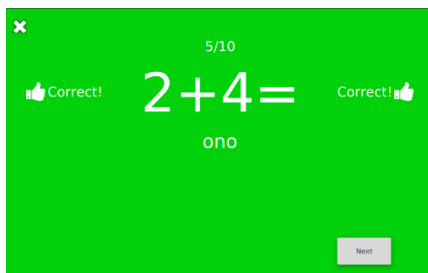
and it is determined whether the answer spoken matches the answer to the evaluated mathematical expression. The current implementation of voice recognition is very kind, if the program detects the correct words spoken in the correct order amongst other words or background noise, it will consider the answer correct.

When submitted, if the answer is deemed incorrect the background of the window will turn red, and the user will be prompted with the option to “Try Again” or to “Skip”. Skipping or answering the question incorrectly once again results in the correct answer being shown on screen and the user prompted to move on to the next question. If at any point the answer is deemed correct, the background



Equation Game - Incorrect

will turn green, the correct answer will be shown and the user is prompted to move on to the next question.



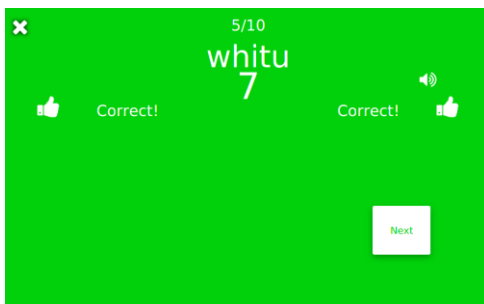
Equation Game - Correct

NOTE: Try to record in a space with as little background noise as possible, and ensure the microphone sensitivity is turned down to the point where audio recorded is clear and smooth.

The reverse game mode will show a number on screen in Māori, and it is the users job to use the on-screen keyboard to type the corresponding integer to the word shown. When submitting the user is only given one chance, and the same colour changes as above apply to the

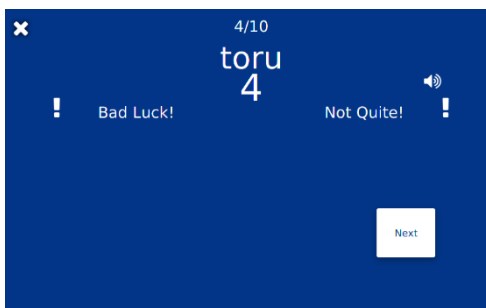


Reverse Game - Enter the Number!



Reverse Game - Correct

number label, above the “Clear” button, there is a speaker button. When pressed, a recording of the number pronounced by a native Maori speaker will be heard. The recording can be heard multiple times by the user, including after an answer has been submitted.



Reverse Game - Incorrect

Custom games have the same functionality as the equation game mode. The difference is that

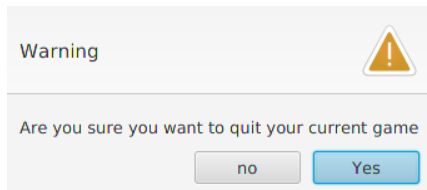
all questions are sourced from the custom question list selected before starting the game, and hence can have any number of questions in a single

game. User statistics are not tracked for the custom game mode.



Custom Game – Only 6 questions!

If at any point the user wishes to exit a game before completion, the cross in the upper left corner can be pressed, and the user will be prompted with a confirmation window like that displayed. If yes is selected, the user will be returned to the level select menu, and if in an equation or reverse game mode, statistics will be tracked for those questions answered in the game before exiting.



Exit Game Confirmation Dialogue

Once a game has been completed the user will be shown their results from the game as a table shown below. The table displays the question number, equation / integer and the Maori evaluated / translated equivalent. Furthermore, the table gives a summary of what questions the user answered correctly and incorrectly. If the user has scored higher than

You scored 8/10			
Congratulations! A new personal best!			
Q.NO	Question	Translation / Answer	Your Answer was...
1)	3	toru	Correct
2)	1	tahi	Correct
3)	6	ono	Correct
4)	8	waru	Correct
5)	9	iwa	Incorrect
6)	7	whitu	Correct
7)	7	whitu	Correct
8)	7	whitu	Incorrect
9)	6	ono	Correct
10)	3	toru	Correct

Results Window

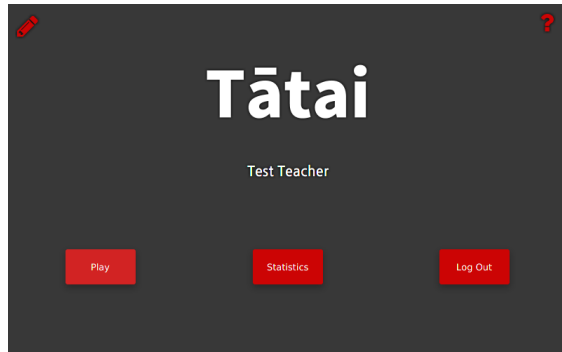
all previous attempts at that game type and level, a notification will appear announcing that a new high score has been set. High scores for each game mode on each level can be viewed in the statistics menu. If

8 or more questions are answered correctly in equation mode, level 1, a button will appear offering to take the user straight to level 2.

Users will initially have both game modes in level 2 locked until they score 8 or more in level 1 equation mode. Doing so will unlock level 2 equation mode. Level 2 reverse mode can be unlocked by scoring 8 or more in level 2 equation mode.

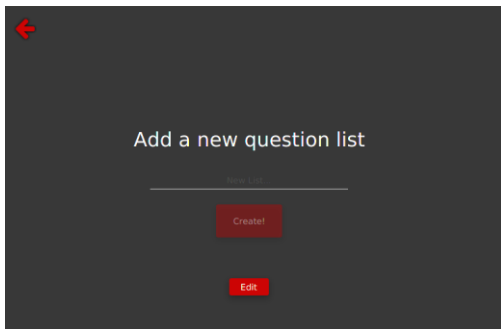
Users

Tātai supports two kinds of users; teachers and students. Students are able to log into a session, play any game mode, and have their gameplay statistics tracked on



Main Menu - Teachers View

their personal account. A student can view their statistics at any time as well as acquire achievements from gameplay, which can also be viewed in the statistics window.



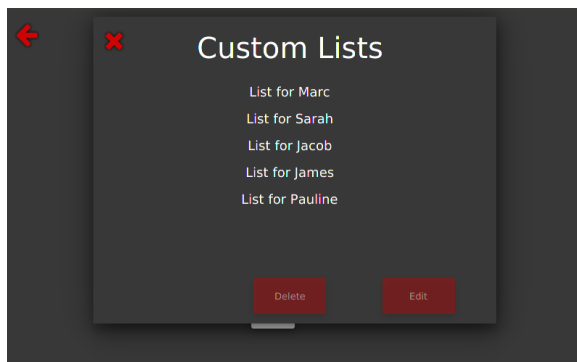
Create a New Custom List

edit custom question lists available for all users on the machine to play. Adding a new question list directs the user to a Tātai question input window, where questions can be typed in by clicking buttons on screen, or by pressing key bindings on the keyboard. Questions are limited to one operator in length.

Teachers have all the abilities students have, minus the ability to gain achievements, and with the addition of access to the teachers editing suite. In this application suite teachers have the ability to add and



Input Questions for Custom List



View Custom Lists

When question list input is complete the teacher can then exit, and view all custom question lists in the edit tab. Here lists can be deleted or edited by pressing “Edit” or “Delete” respectively, while an element of the list is selected. Double clicking a list element will have the same effect as pressing the “Edit” button on that list. When editing a list, a secondary view displays the contents of the question list. Here individual questions can be removed from the list.



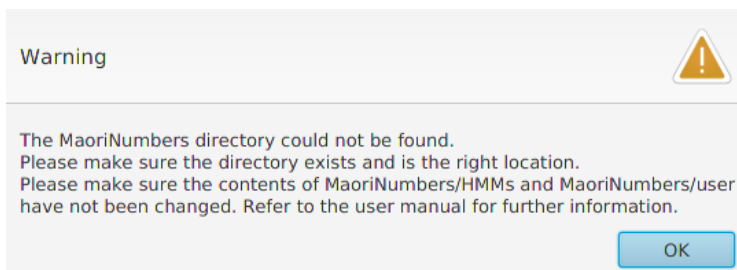
Edit Custom Lists

Data

On first run of the Tātai application a folder called “data” will be created in the TataiData directory. This folder will contain user generated data from application use. If the folder is opened at this stage an empty subfolder called “users” will be found. When application users are created this folder will contain text files laid out in JSON format which contain the metadata of that user (statistics, user type, etc).

When custom question lists are created through the application a second folder in “data” will be generated called “lst”. Custom lists are generated here as .txt files, and are able to be directly edited through a text editor. The formatting of these files is rather specific, and hence it is recommended question lists are edited through the teacher’s suite in the application. If question lists are to be altered manually, answers to equations MUST evaluate to between 1 and 99, contain ONE operator and end in an “=” symbol. One equation per line, and no blank lines in the text file.

If the TataiData directory is not in the user’s home directory when run by double click, or is not in the same directory as Tatai.jar when run from the command line, games will display an error window when recording is attempted. Furthermore, the contents of the MaoriNumbers directory must not change from the delivered package, or else the error window will show as a result.



Warning Shown when Attempting to Record Without Proper MaoriNumbers Directory Contents

Skill Levels

The criteria for achievements is shown below

*Other = total correct, answered, etc.

Platinum:

Average > 94%

Other > 999

Gold:

Average > 84%

Other > 99

Silver:

Average > 74%

Other > 49

Bronze:

Average > 59%

Other > 24

Key Bindings

- **ENTER** - Enter selected item in a list or menu, finish user form
- **ARROW KEYS** - Change selection of button highlighted
- **SPACE** - Press highlighted button
 - While Playing in game mode, auto focusing highlights the record, submit and next buttons, so a game can be played through only by pressing space!
- **ESC** - Quits the current game
- On-screen keyboards:
 - Numbers are bound to number keys on screen.
 - Operators are bound to following keys:

+	➔	'+'	(only on keyboard w/ numpad)
-	➔	'_'	
×	➔	'X' or '*'	
÷	➔	'/'	