User Manual

Performing Ecological Momentary Assessments (EMA) via Picroft or Mobile App

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Overview

This system (Daisy) accommodates two different types of users: **researchers** and **general/ clinical trial users** simply known as **users** in this document. The Daisy system allows researchers to send questions to users via a Mycroft home assistant or mobile app and receive answers. A researcher will send closed questions with possible answers to the user and the user can select any of these answers as their response. This is then sent back to the researcher to analyse. The system uses *context detection* to determine which *scenario* the user is in and send questions from a researcher accordingly.

Context detection uses GPS information from the users mobile phone and home assistant as well as microphone data from the phone to decide what device to send questions to. The following are the different scenarios that a user could be in and the device that questions would be sent to:

Scenario	**Device used:**
User is near the home assistant and is alone.	Home Assistant
User is near the home assistant and has company.	Phone
User is away from the home assistant.	Phone

This manual will cover how to use the system from the perspective of both types of users.

Glossary

mycroft	An open source home assistant.
daisy	The system that handles asking the questions and storing the answer via the mobile app and mycroft home assistant.
mycroft skill	A program that runs on the mycroft to perform tasks for the user e.g. Checking the weather.
utterance	Anything spoken by the user to Mycroft.
dialog	Anything returned to the user by Mycroft.
android	The platform on which the mobile application runs.
marketplace	A website where mycroft skills are shared.
github	A website where code is stored.
raspberry pi	A small single board computer.
user	A person that receives questions.
researcher	A person that sends questions and receives answers.

Installation

User

Installing the App

The Daisy mobile application is only currently installable through an APK file. This file will be downloaded from the internet and installed on the user's smartphone. The user will require a smartphone that supports at least the Android version 5.0 Lollipop (API level 21) in order to perform the required functionalities. In a preferred scenario where the application is freely available to the public, the application will be available in the different Android App stores such as Google Play Store and Galaxy Store.

Setting up Mycroft

The Mycroft is an open source home assistant that can be issued voice commands known as *utterances.* Different tasks performed by the Mycroft from these commands are completed via the use of *skills* for example checking the weather. The Daisy skill needs to be installed on your Mycroft.

Installing Mycroft

There are two ways to use Mycroft. The Mycroft software can be installed on a raspberry pi with additional hardware needed, or a device with all the necessary components can be purchased with the software loaded already. The components needed for the raspberry pi version of Mycroft will be: a microphone (playstation eye), a set of speakers (logitech) and a raspberry pi GPS module. The devices in brackets are what is recommended to use.

Once you have the Mycroft system set up, follow the instructions from https://mycroft.ai/get-started/ to begin your installation. Once your Mycroft installation is complete continue your Daisy installation by installing the Daisy skill.

Installing the Daisy Skill

Myroft skills are saved on github and uploaded to the marketplace. However, the Daisy skill is not stored on the marketplace and can only be retrieved from github. To do this, the command line interface for Mycroft must be available by connecting it to a monitor and keyboard. Then, ensure you are in the virtual environment *(.venv)* on the mycroft and then *mycroft skills manager* (MSM) must be used by executing the following:

```
msm install daisy-skill
```

Once the skill has been installed the monitor and keyboard can be removed and mycroft can be prompted with *Hey Mycroft* followed by the skill i.e. *Start Daisy.* This will be explained in more detail in the *User Guide* section of this document.

Researcher

Installing the App

The installation method for the mobile application does not differ from a regular user to a researcher user. Just like for a user, the Daisy mobile application for a researcher is only currently installable through an APK file. This file will be downloaded from the internet and installed on the user's smartphone. The user will require a smartphone that supports at least the Android version 5.0 Lollipop (API level 21) in order to perform the required functionalities. In a preferred scenario where the application is freely available to the public, the application will be available in the different Android App stores such as Google Play Store and Galaxy Store.

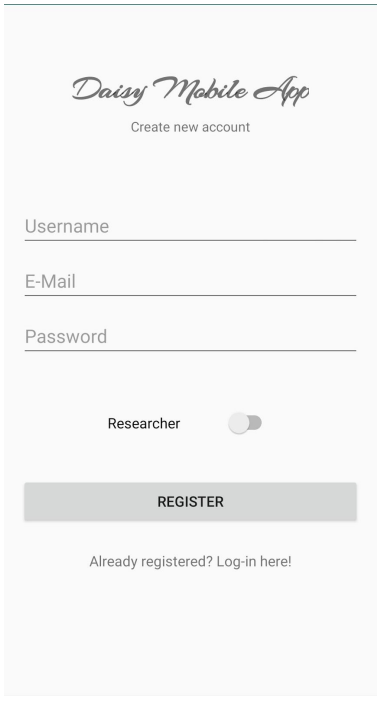
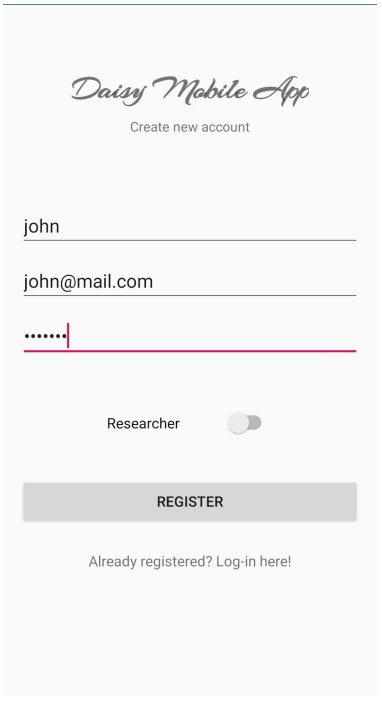
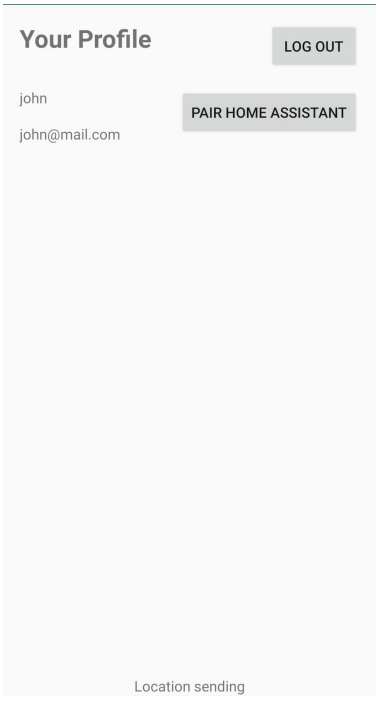
User Guide

User

To begin using the system you must create an account with the Daisy app on your android mobile phone. Once you create an account you must then create a pair code which you can then say to Mycroft to connect as your home assistant to the system. You are now ready to receive questions.

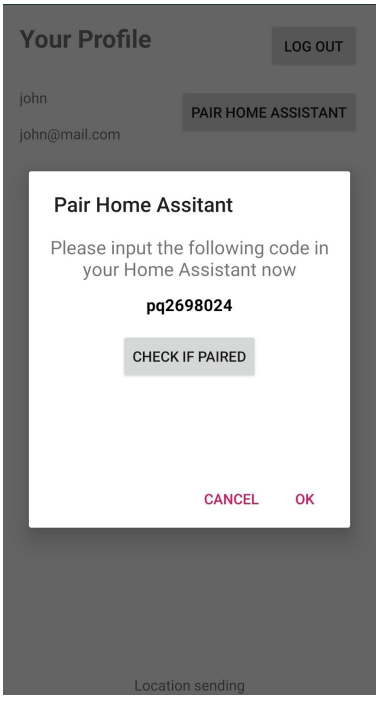
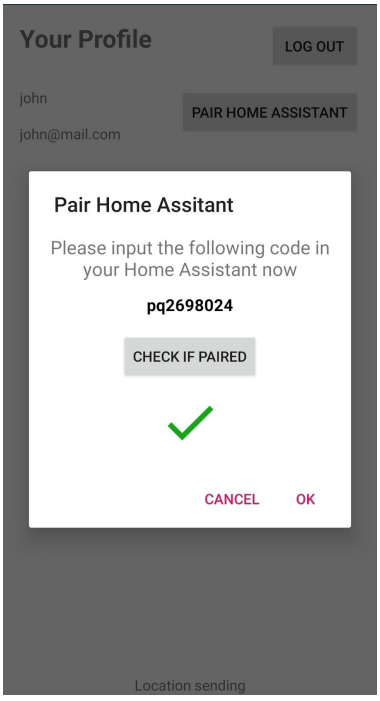
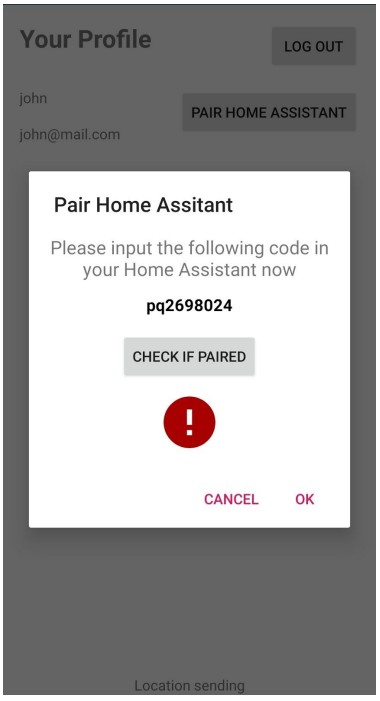
Setting up an Account

Upon opening the app, you will need to create an account. You need to enter a unique **username**, **email** and **password**. The email and password are what you need to remember in order to sign back into the app should you log out.

		
Sign up screen.	Example user created.	User profile screen.

Pairing with Mycroft

In order to pair with the Mycroft home assistant you must click the *pair home assistant* button. You will then be issued a unique pairing code from the app which you must say to Mycroft.

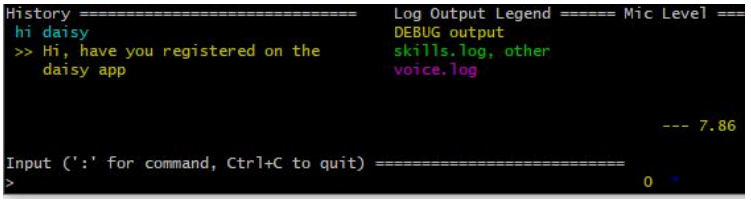
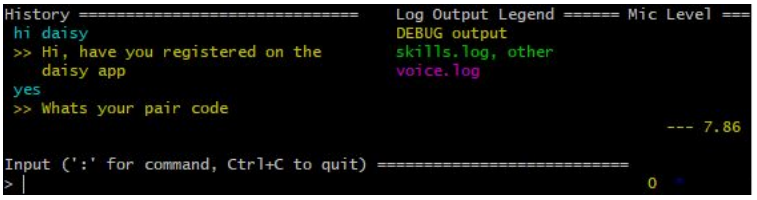
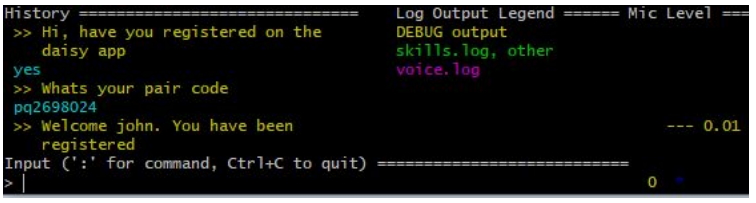
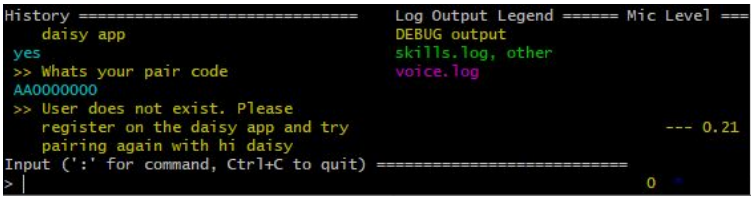
		
Pairing code issued. Clicking *Cancel* will cancel the pairing operation and issue a new pairing code next time. Once you have been given the pin, you must say it to Mycroft to complete registration. You can then click the *Check If Paired* button to confirm that you have been successfully paired.	Clicking *Check If Paired* will show a tick symbol if you have successfully paired with Mycroft. The *pair home assistant* button will also change to a green *user paired* label to confirm that you are paired.	Clicking *Check If Paired* will show a warning symbol if you have unsuccessfully paired with Mycroft.

For Mycroft, you must start the home assistant by saying: *Hey Mycroft.* This is the prompt to allow Mycroft to begin listening for any commands that will use a skill. The commands for starting the Daisy skill are: *Hey Daisy, Hello Daisy, Hi Daisy,* or *Start Daisy.* An example interaction could begin with: *Hey Mycroft, start Daisy.*

The pairing process on the Mycroft proceeds as follows:

Note: The following show screenshots from the Mycroft Command Line Interface (CLI) where commands can be typed in and viewed on a monitor.

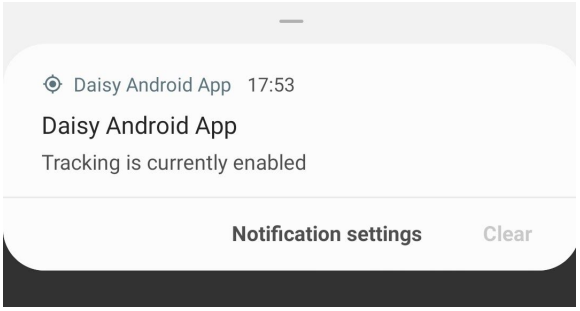
When using Mycroft, a monitor and keyboard are not needed, all commands are spoken. All text in blue are your *utterances* and all text in yellow is the Mycroft *dialog*.

Initial interaction with the Daisy skill. **Note: The *Hey Mycroft* command is not shown here as the CLI doesn't require it.**	
Daisy asks for the Pairing Code.	
The Pairing Code is uttered by you, Daisy checks this and if correct, you are registered. This means you are linked to the correct home assistant and can begin receiving questions on either this device or your mobile phone via the Daisy app.	
Note: In the event that you utter the wrong pin, the skill will tell you to try the registration process again.	

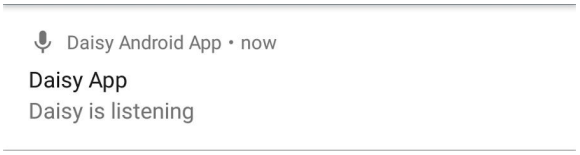
Once you have successfully registered the Mycroft as your home assistant you don't ever need to further initialise any future interactions. When a question has been sent to your home assistant, it will prompt you.

Responding to Questions via the Daisy App

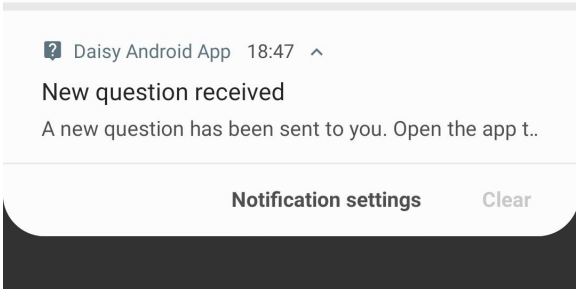
When you open the daisy app, it begins to send your location every minute to the database to be used for context detection.

	A notification lets you know that Daisy is sending your location and is ready to receive questions.

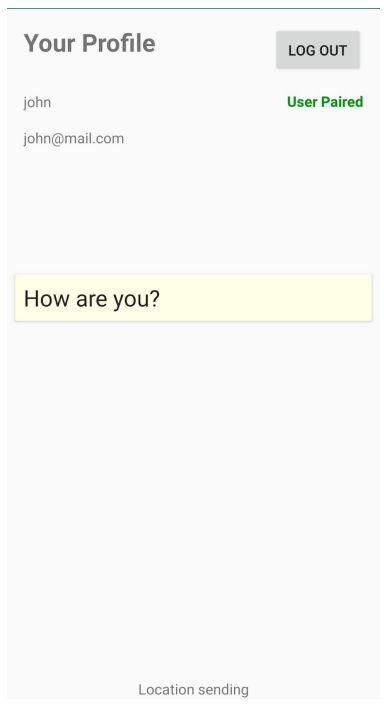
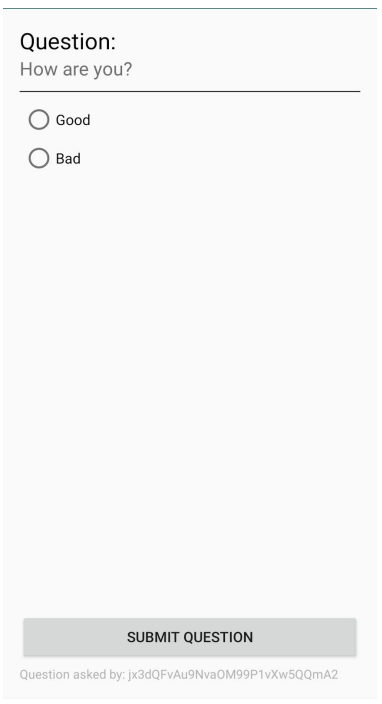
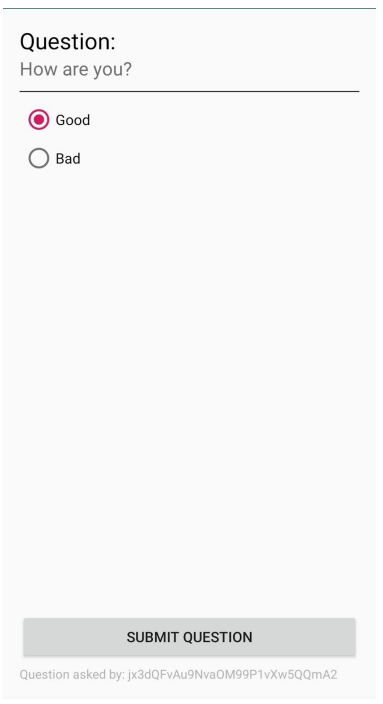
In addition to tracking the user's location, the mobile application will begin to record the user's audio every 15 minutes in order to perform context detection to detect whether the user is in a social situation.

	A notification lets you know that Daisy is recording audio. The notification is only shown whilst the application is recording audio.

This allows the app to receive questions. Shutting down the app stops this from happening. When you receive a question you will get the following notification:

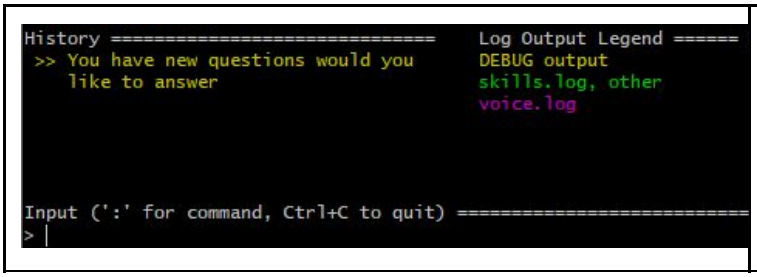
	This notification lets you know that a question has been received and is available to view and answer from the app.

To answer a question open the Daisy app, select the question, select your response, and submit.

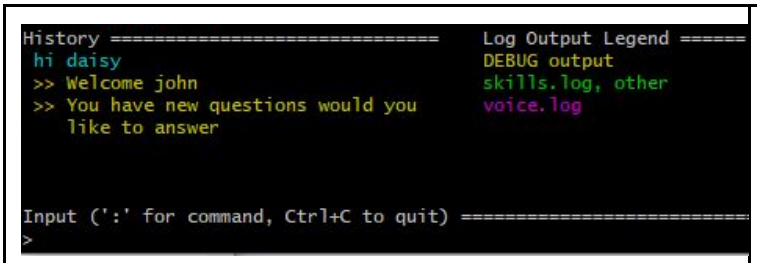
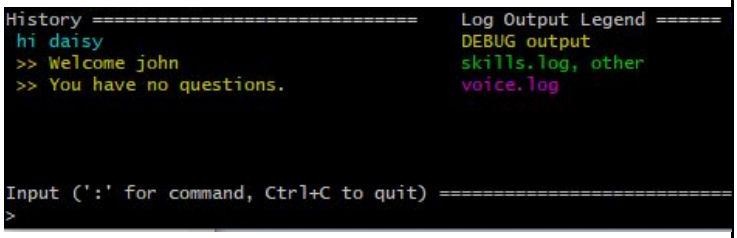
		
New question to be answered.	Selecting the question will bring you to this screen.	Select your response and click the *Submit Question* button.

Responding to Questions via Mycroft

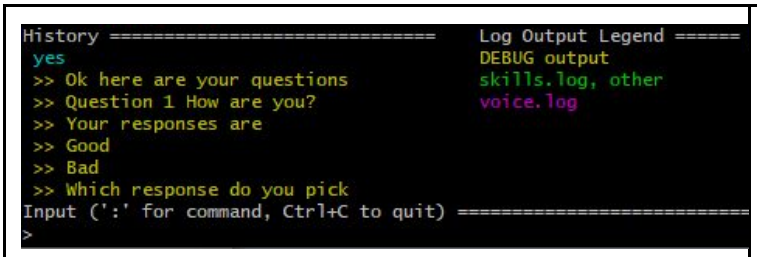
Once you are registered with the Daisy skill, it will send your location once to be used for context detection. Receiving a question on the Mycroft will prompt the following:

	This prompt from Mycroft indicates that you have been sent new questions.

Alternatively you can start the Daisy skill when you wish and it will let you know if you have any new questions.

	Starting the Daisy as usual will tell you if you have new questions.
	If you have no questions that need to be answered, Daisy will let you know.

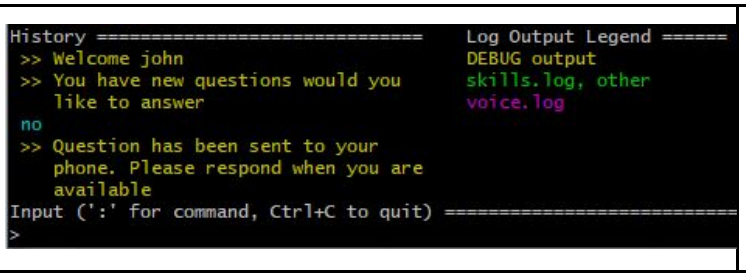
If you have questions that need to be answered you can choose to respond with a **yes** or **no** utterance**.** Responding with **yes** will begin the questioning process where Mycroft will cycle through the questions you have been sent as well as the response options for each question. Respond with the response option given and this will be saved and sent to the researcher.

	Responding with **yes** allows Mycroft to issue you the questions with response options. It waits for you to select a response. If you do not select a response in a sufficient amount of time, the process must be repeated by starting Daisy.

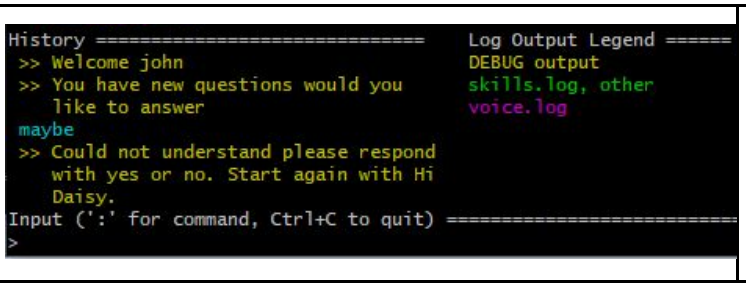
In the example above, if you pick **Good,** Daisy will save this response and send it to the researcher.

	The response **Good** has been uttered and saved.

If you decide to respond with **no** the skill will send your question to your phone to be answered at your convenience.

	Responding with **no** sends the question to your phone.

If you respond with an invalid response you must start the process again by starting the Daisy skill again.

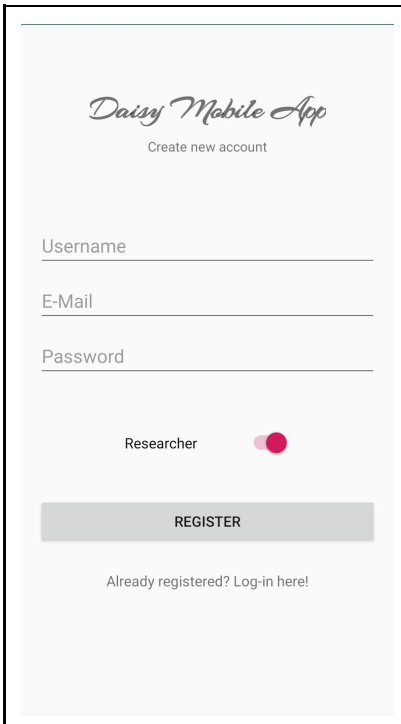
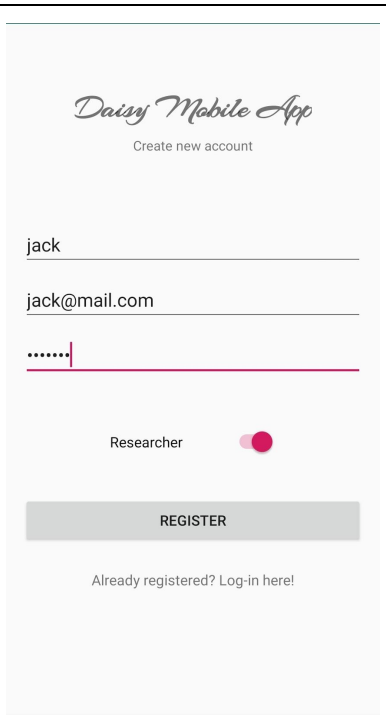
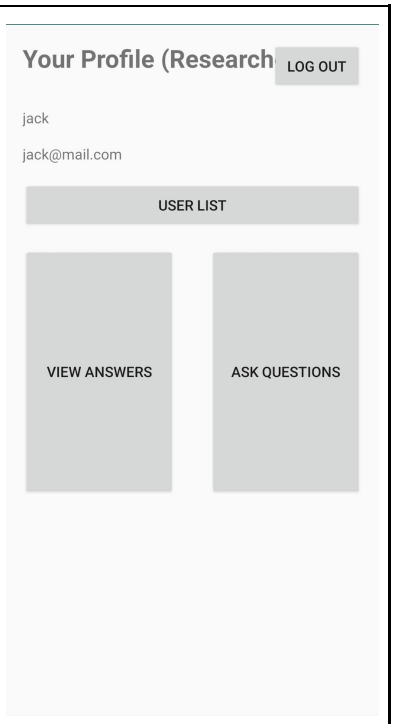
	Responding with **maybe -** an invalid response - will prompt Mycroft to tell you to start again..

Researcher

To begin using the system you must create an account with the Daisy app on your android mobile phone and press the researcher switch. Once you create an account you can add users by their username and send them questions. Once a user responds with an answer the Daisy app will notify you and you will be able to view answers in the app.

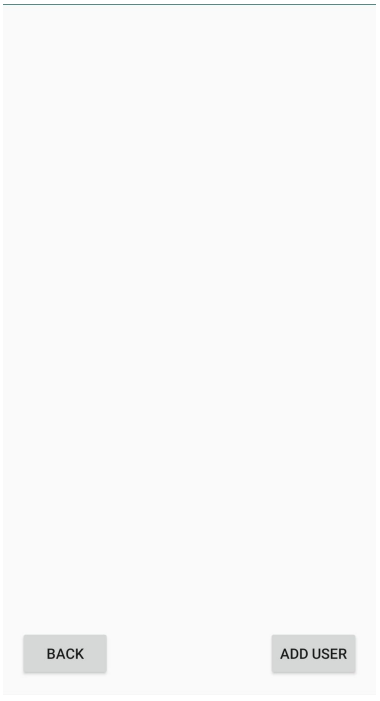
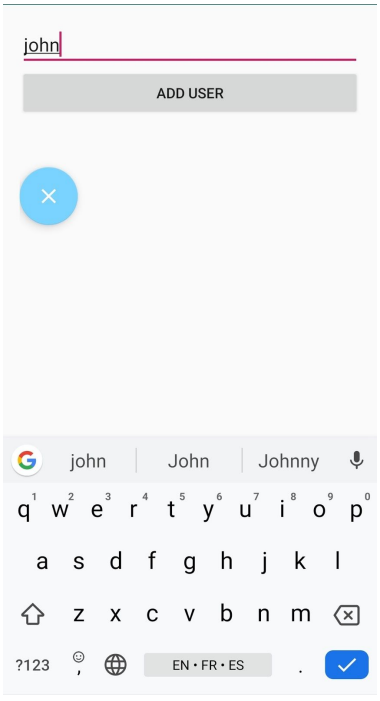
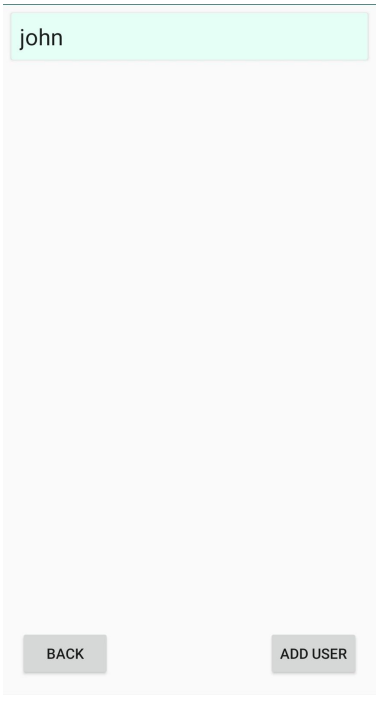
Setting up an Account

Upon opening the app, you will need to create an account. You need to enter a unique **username**, **email** and **password**. The email and password are what you need to remember in order to sign back into the app should you log out. You need to press the researcher switch.

		
Sign up screen with researcher switch enabled.	Example researcher created.	Researcher profile screen.

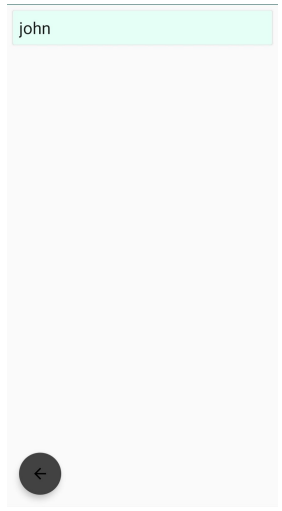
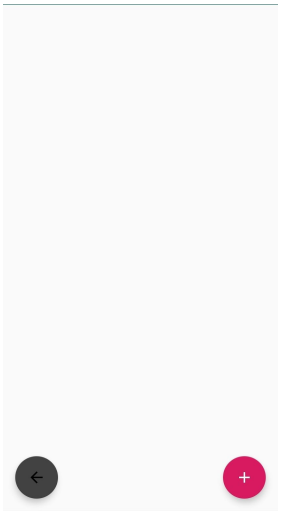
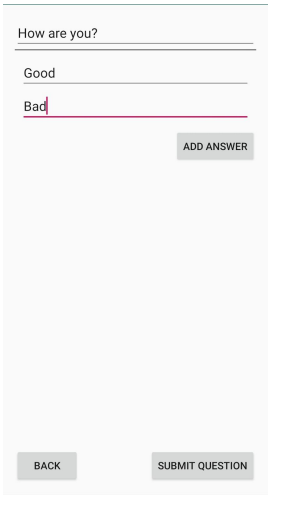
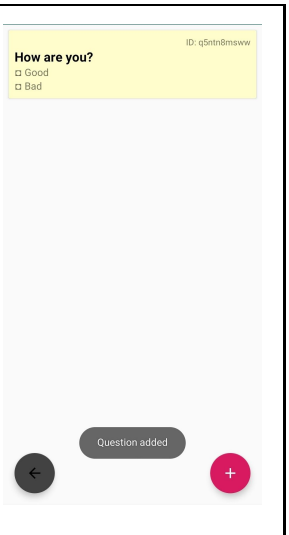
Adding a User

To send a question to a user you must first add them by their username. To do this, select the *User List* button and proceed as follows:

		
Clicking the *User List* button brings you to the user screen. To add a user you need to click the *Add User* button.	A text field appears and in this example, the user **john** is added. Click *Add User* to confirm this user.	The user will now appear in your user list. If this user does not exist, the user will not be added.

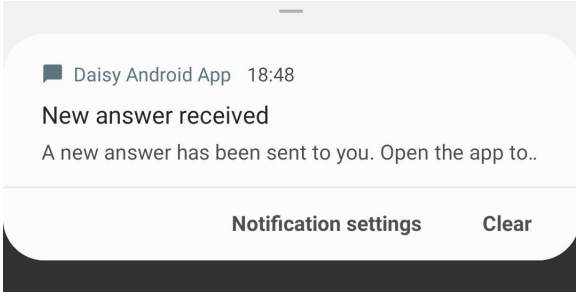
Sending Questions

To send a question to a specific user click the *Ask Questions* button on your profile screen and proceed as follows:

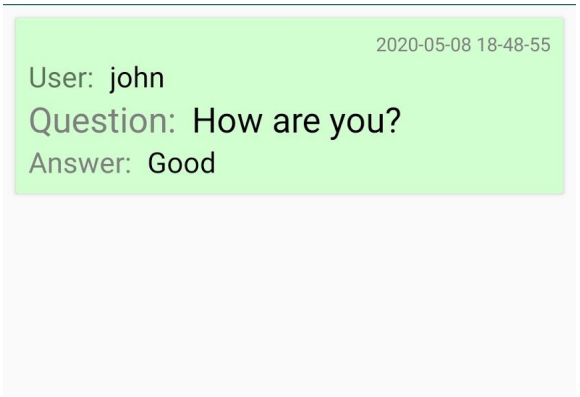
			
Select a user to send questions to.	You will see all questions that are being asked. To ask a new question, press the *plus* icon.	A question text field as well as response text fields will appear. In the example above **How are you** is inputted with responses **Good** and **Bad.** Clicking *Add Answer* allows for more responses to be added.	Once you click *Submit Question* in the previous screen your question will be added and Daisy will decide which user device to send to and send the question **immediately.** As soon as the user responds Daisy will notify you.

Receiving Answers

Once a user has responded to your question, Daisy will send you a notification:

	Notification indicating the user has responded to your question and you can view their answer on the app.

Once you open the app, click the *View Answers* button to view all your users' responses. With this example used, the following appears.

	We can see the following information in this response box: ● The date and time the user responded at is displayed in the top right. ● The user's name, in this case: **john.** ● The question the researcher asked: **How are you?** ● The answer the user responded with: **Good.**