Project Report

Automatic Pet Feeder

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1. **Introduction**

a. Overview:

Automatic pet feeder is one of the new technologies for feeding pet. It will help pet owner to take care of their pet while they are not at home. Even the owners are not at home, they still can feed their pet. Automatic pet feeder is built to help pet owner taking care of their pet. This pet feeder is one of the pet feeders that will be controlled by a mobile application through internet.

The automatic pet feeder will automatically dispense predetermined amount of food and water to the bowls. As pet lovers, user should understand those pets also need a proper diet management. Whether user away from home unexpectedly or simply would like one less chore to worry about, user can feel secure that the beloved pet will be cared for and fed on time every time. The Automatic pet feeder will solve two problems which pet owners face i.e., making sure that each pet has access to a healthy amount of food throughout the day, regardless of the owner's schedule.

Making sure that each pet eats only its own food though there are a variety of products on the market which solve the first problem, there are none which address the second. The automatic pet feeder will give pet owners a solution to both problems, thereby improving the lives of both pets and owners by allowing the owner to reliably provide food to a pet at the time the owner wishes and keep the pet from reaching the food stored for later feedings. Many animal feed systems can be designed to function as an automatic device that allow the user to feed whenever he wishes from anywhere through internet. The purpose of having sensors in a system like this is to automate the feed process completely with less human interference.

b. Purpose :

The main purpose of this project is to create an automatic feeding machine for pets feeding.

Whenever we go to work or are away on vocation. We always end up paying so much money for pet sitters to feed our pets. We realized that adapting a pet feeder to an iot application would not only solve

our problem but would also benefit other pet owners.

Automatic pet feeders can help the owners to keep in check the eating habits of their pets. Automatic feeders can also help provide proper weight management by giving your pet the portioned feedings they need.

2. **Literature Survey**

a. Existing problem:

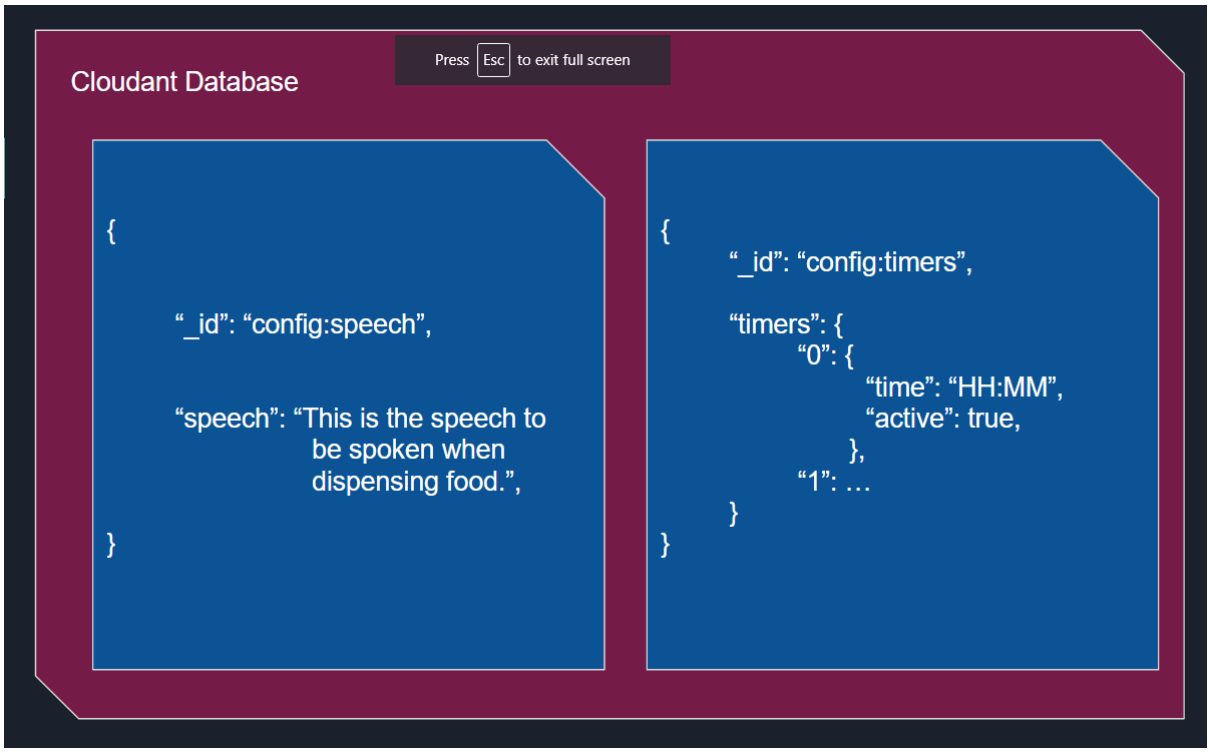
Because modern lifestyle is extremely busy, pet owners often forget to feed their pets. This is a problem as it may affect the health of the animal. Similarly if the pet eats too much it is necessary to limit their diet otherwise they might become obese. In both the cases the health of the animal is at risk.

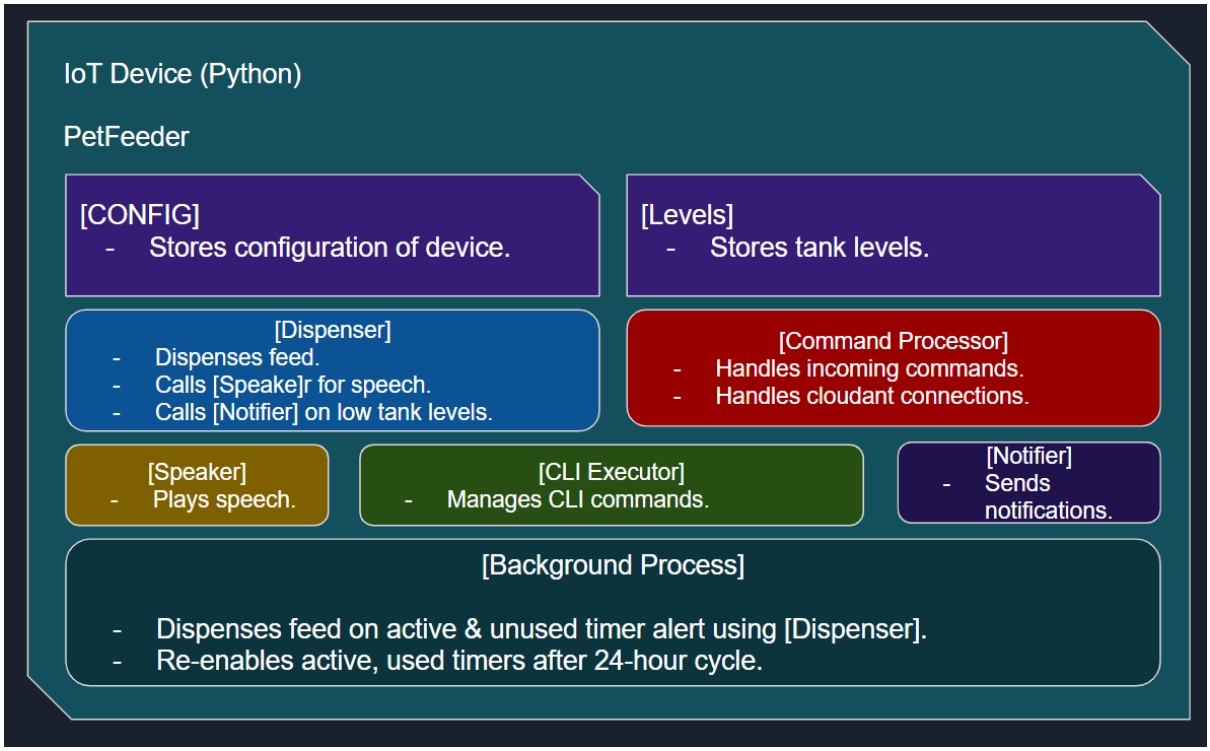
b. Proposed solution:

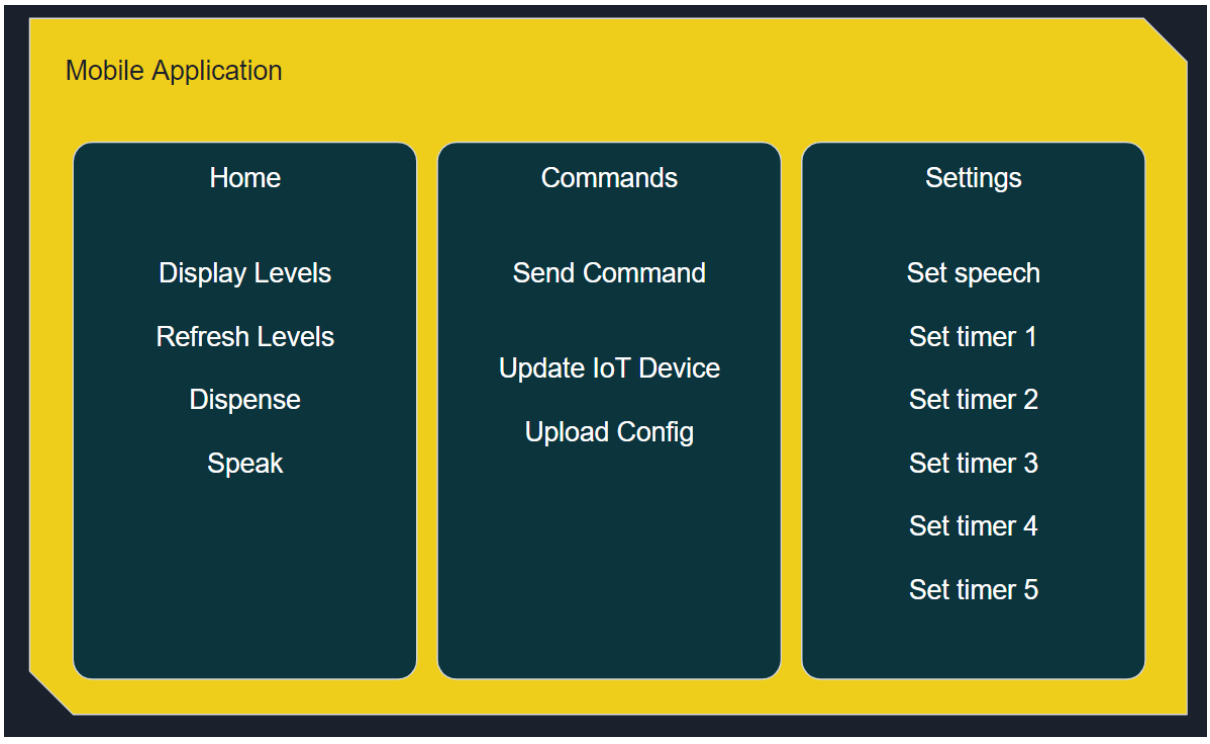
To address all these issues is where Automatic pet feeder comes in. The automatic pet feeder can make sure that the diet of the pet is maintained to a healthy level. It can also help the owners keep track of how much their pet is eating. The pet feeder is connected to the cloud, where it stores all the food related data which is sent to the user on the android application. The user can thus track the eating habits of their pet.

3. **Theoretical Analysis**

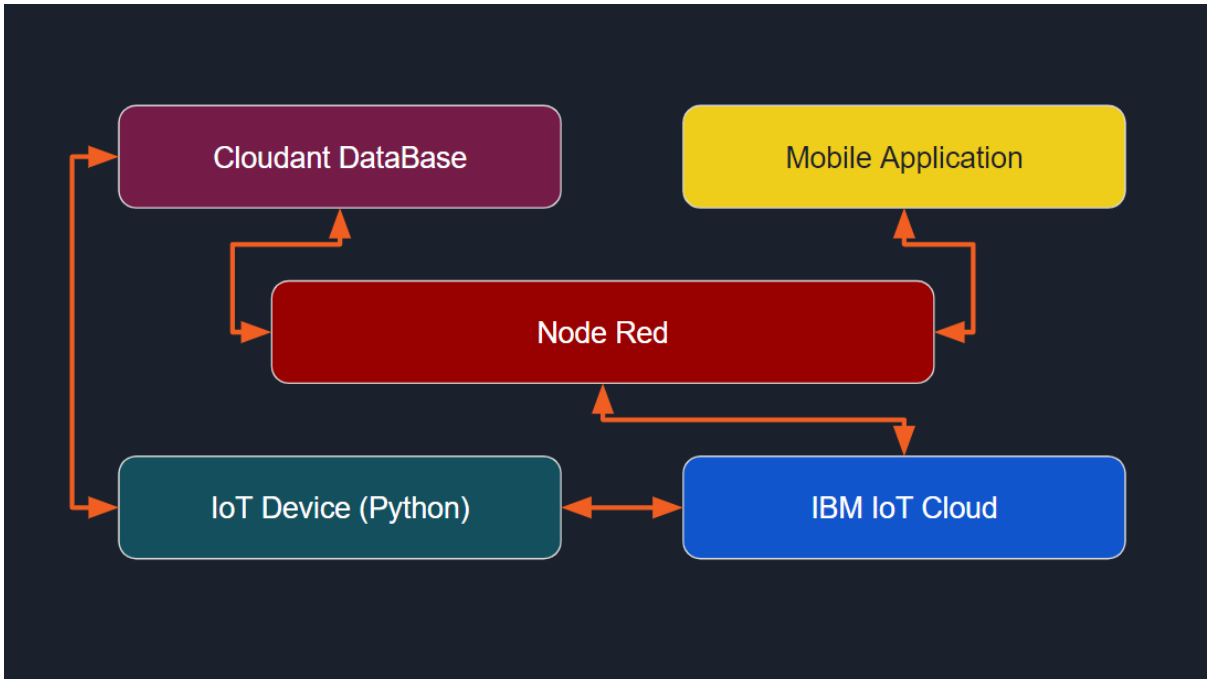
Block diagram and Software Design :




IoT Device (Python)
PetFeeder
[CONFIG]
- Stores configuration of device.
[Levels]
- Stores tank levels.
[Dispenser]
- Dispenses feed.
- Calls [Speake]r for speech.
- Calls [Notifier] on low tank levels.
[Command Processor]
- Handles incoming commands.
- Handles cloudant connections.
[Speaker]
- Plays speech.
[CLI Executor]
- Manages CLI commands.
[Notifier]
- Sends notifications.
[Background Process]
- Dispenses feed on active & unused timer alert using [Dispenser].
- Re-enables active, used timers after 24-hour cycle.


Mobile Application
Home
Display Levels
Refresh Levels
Dispense
Speak
Commands
Send Command
Update IoT Device
Upload Config
Settings
Set speech
Set timer 1
Set timer 2
Set timer 3
Set timer 4
Set timer 5

4. **Flowchart**



5. **Result**

Automatic pet feeder works efficiently and fulfils the objective of feeding pet in absence of its owner.

The device sends the owner a notification when the pet is fed food/water along with remaining food and water levels. The relevant data is stored in IBM cloud using cloudant which is used to display relevant info in Android which was created using the MIT app inventor.

In case the device runs out of food/water the user is notified about that too so that the supplies can be replinished. This way pet owners can make sure that their pets are well fed without having to worry anything and can maintain their diet at the same time.

6. **Advantages & Disadvantages**

Advantages:

Allowing for predictable mealtimes even if you cannot be home to feed your pet – ideal for long work days or traveling.

Feeding outdoor pets safely and regularly without leaving excess food available for wildlife or pests to access.

Storing extra food in the additional reservoir or container, keeping it safe from pests as well as an uncontrolled appetite.

Disadvantages:

No way to monitor which pet is eating which meal if multiple pets are sharing the feeding area and may usurp one another's meals.

Cleaning can be difficult in more complicated designs and the unit may need disassembly to thoroughly clean moving parts.

The pet Feeder will not function if the batteries wear down or power is lost, which can mean missed meals and disrupted feeding.

7. **Applications**

The automatic pet feeder can be used to feed pets without having to worry about missing their meals. Despite having its disadvantages the automatic pet feeder is a versatile device and can work in different environments depending on the kind of hardware used. Not only that, this kind of device can be used in many other kind of different scenarios like feeding cattle in a farm, or even wildlife.

8. **Conclusion**

Automatic feeding can be done by connecting Android application with server and Automatic pet Feeder through IBM IOT platform, and they exchange messages with MQTT protocol.

The communication between Android application, server, and Automatic pet Feeder cannot be read by other part and thus is completely secure. The data is stored in IBM cloud (Cloudant) in which each document is protected by a unique id and password.

The Android application was created using MIT app inventor which ensures that necessary information is conveyed to the user. Like when the pet is fed or is the feeder out of food/water. This allows the user to better stay in touch with their pets as well as the feeder also has pre-recorded voice of the owner.

Since the interaction between humans and machine is increasing day by day it

9. **Future Scope**

For future development, Automatic pet Feeder can be made larger using larger dispenser to store the pet food. The application can be improved with some new features, such as adding gestures, changing activity into fragment, or adding some new functions for new devices.

Since the daily lifestyle as well as technology is evolving at a rapid rate. Future use for such kind of device can be seen in a variety of areas like polutry farms, cattle farms etc. since all these areas require large manpower to feed such large number of animals. Such kind of automatic feeders will be very useful in these kind of scenarios.

10. **Bibliography**

Advantages and disadvantages - https://allthingswoof.com/blog/44916/pet-food-automatic-containers-pros-and-cons

General Idea of project - https://www.researchgate.net/publication/314105271_Smart_dog_feeder_design_using_wireless_communication_MQTT_and_Android_client

Applications : https://www.petpact.com/dog/advantages-of-an-automatic-pet-feeder/

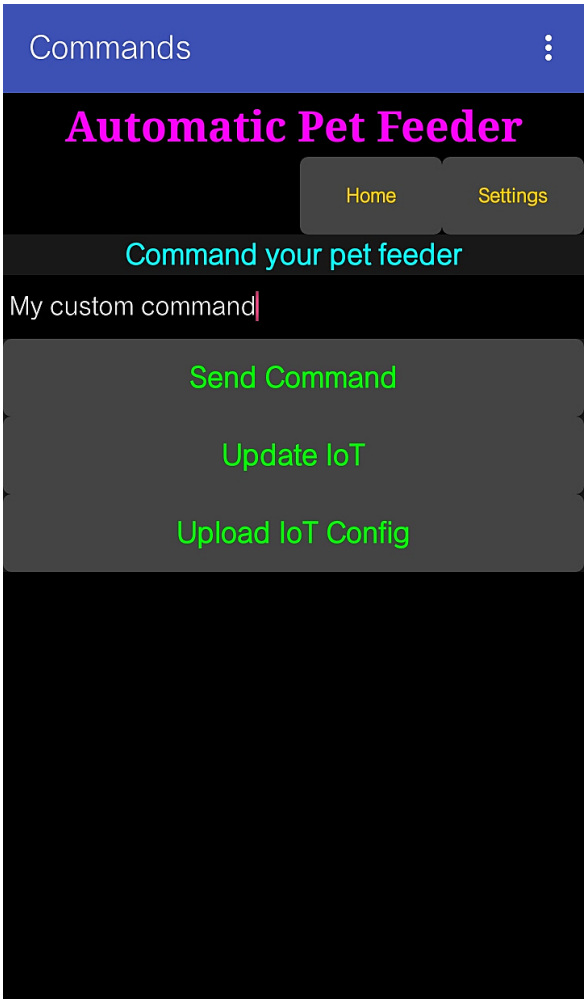
11. **Appendix**

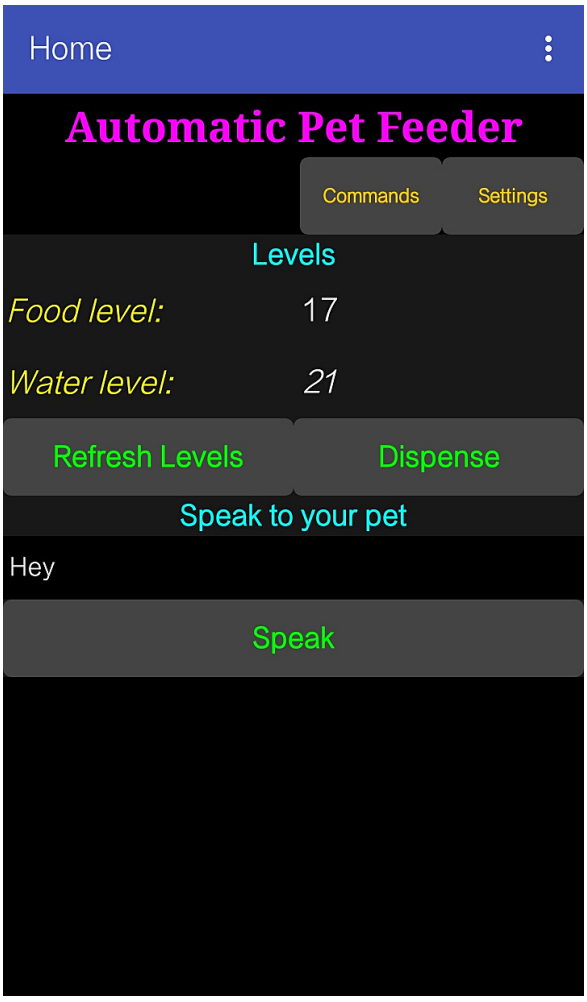
a. Source code :

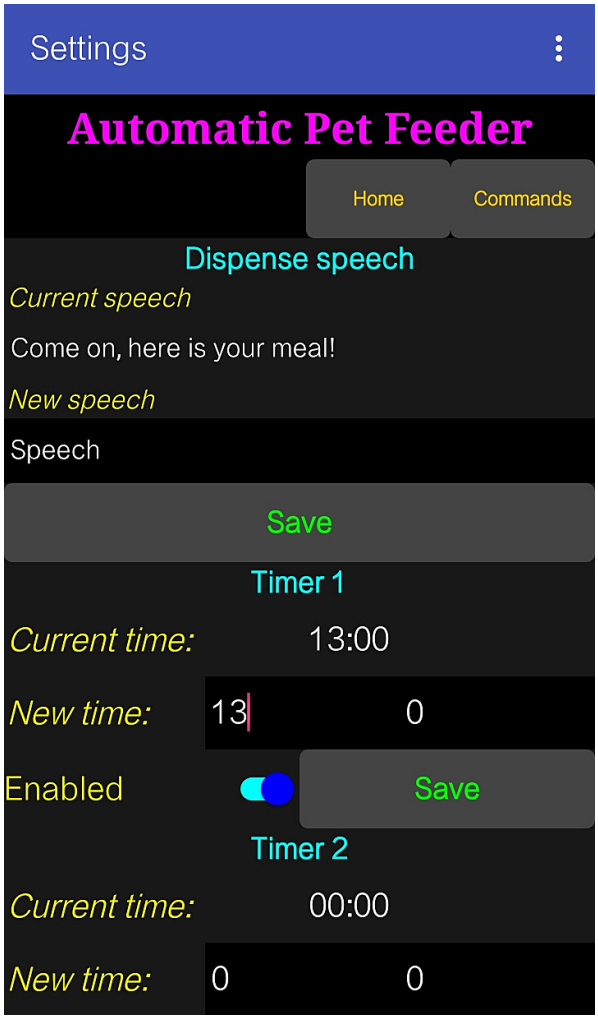
(Refer to Github link) :

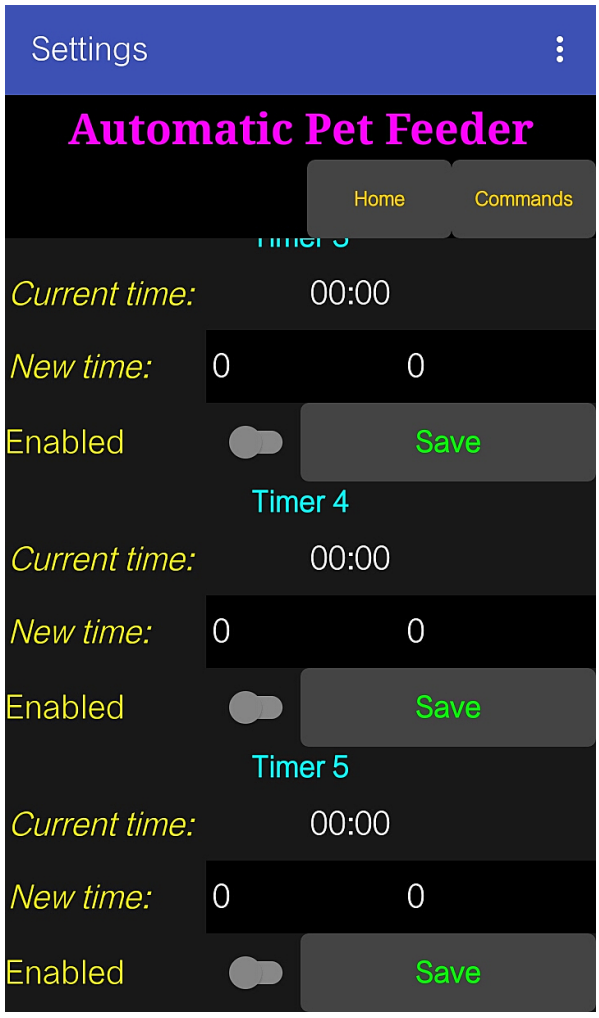
b. UI output Screenshot :

Mobile Application:

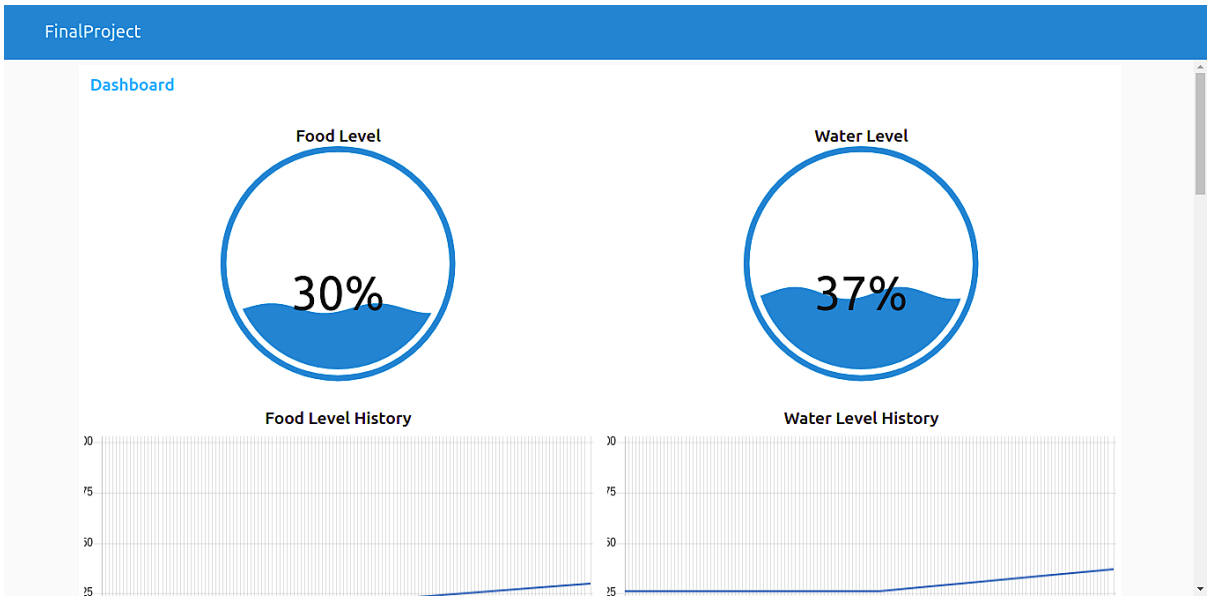


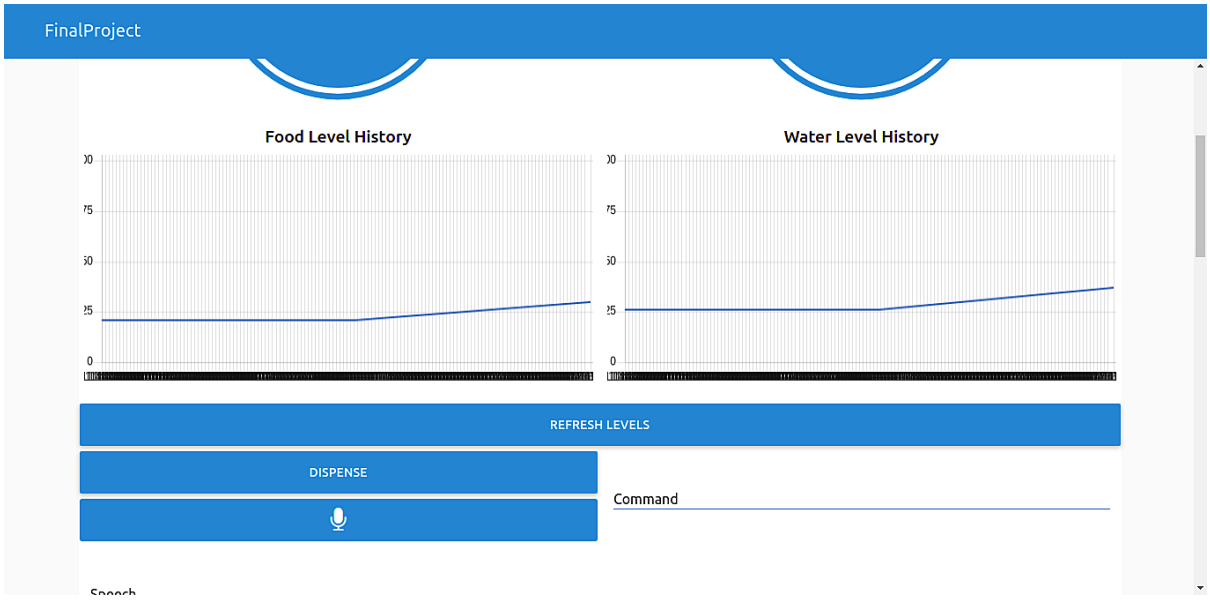


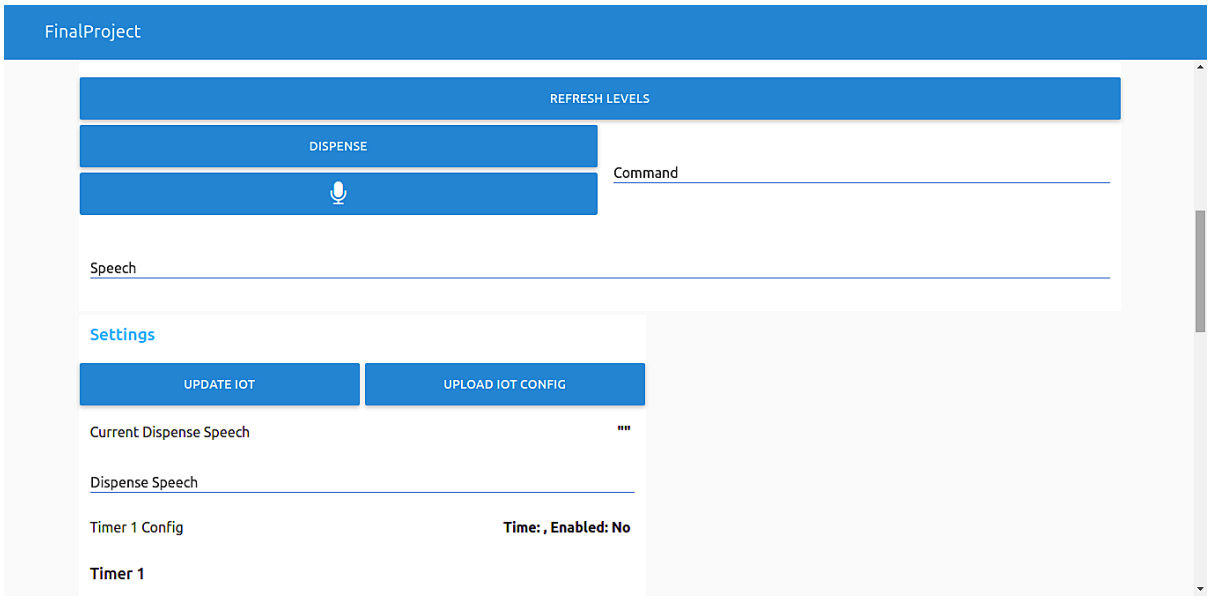

Settings
Automatic Pet Feeder
Home
Commands
Dispense speech
Current speech
Come on, here is your meal!
New speech
Speech
Save
Timer 1
Current time:
13:00
New time:
13
0
Enabled
Save
Timer 2
Current time:
00:00
New time:
0
0

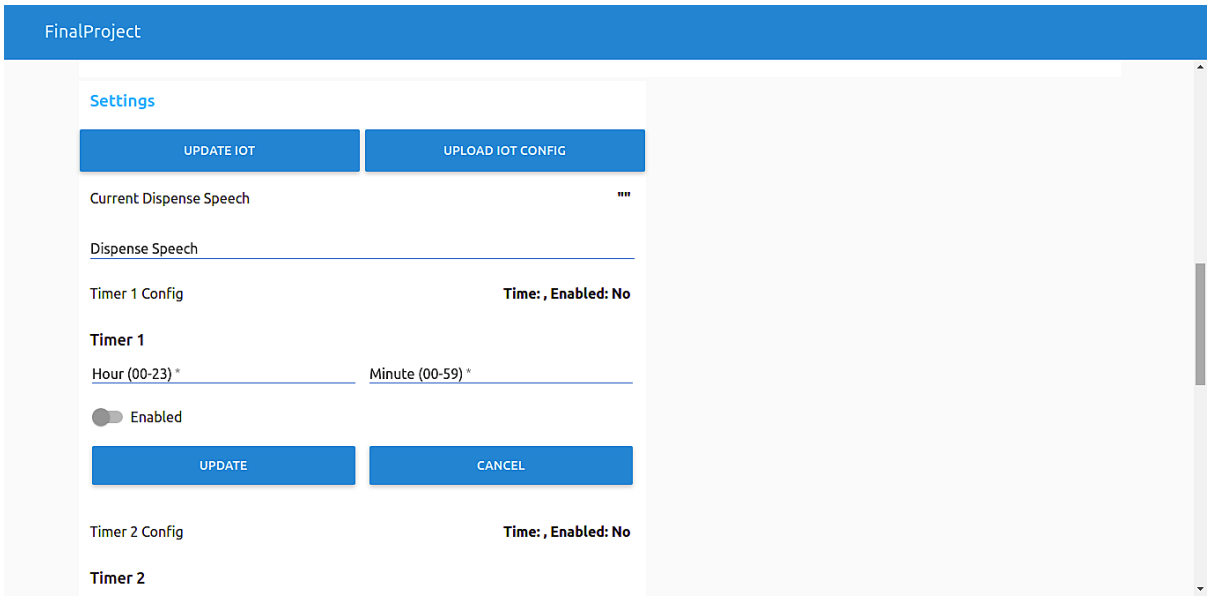

Settings
Automatic Pet Feeder
Home
Commands
Current time:
00:00
New time:
0
0
Enabled
Save
Timer 4
Current time:
00:00
New time:
0
0
Enabled
Save
Timer 5
Current time:
00:00
New time:
0
0
Enabled
Save

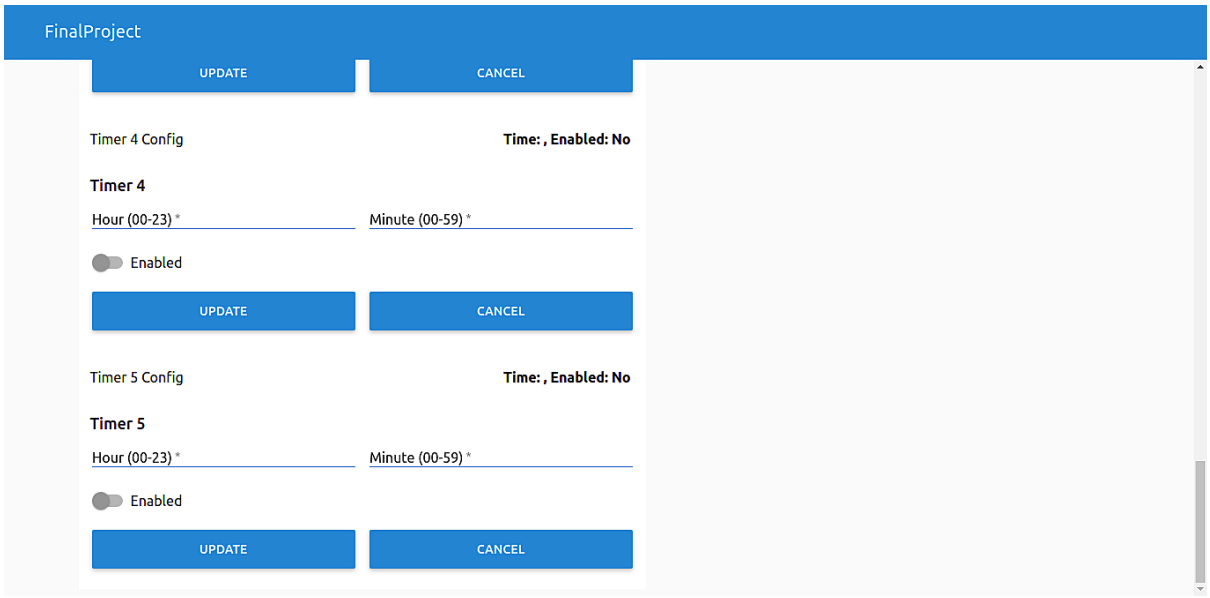
Web Applications :






FinalProject
REFRESH LEVELS
DISPENSE
Command
Speech
Settings
UPDATE IOT
UPLOAD IOT CONFIG
Current Dispense Speech
""
Dispense Speech
Timer 1 Config
Time: , Enabled: No
Timer 1


FinalProject
Settings
UPDATE IOT
UPLOAD IOT CONFIG
Current Dispense Speech
""
Dispense Speech
Timer 1 Config
Time: , Enabled: No
Timer 1
Hour (00-23) *
Minute (00-59) *
Enabled
UPDATE
CANCEL
Timer 2 Config
Time: , Enabled: No
Timer 2


FinalProject
UPDATE
CANCEL
Timer 4 Config
Time: , Enabled: No
Timer 4
Hour (00-23) *
Minute (00-59) *
Enabled
UPDATE
CANCEL
Timer 5 Config
Time: , Enabled: No
Timer 5
Hour (00-23) *
Minute (00-59) *
Enabled
UPDATE
CANCEL