Project Report

SMART AGRICULTURE SYSTEM

BASED ON IOT

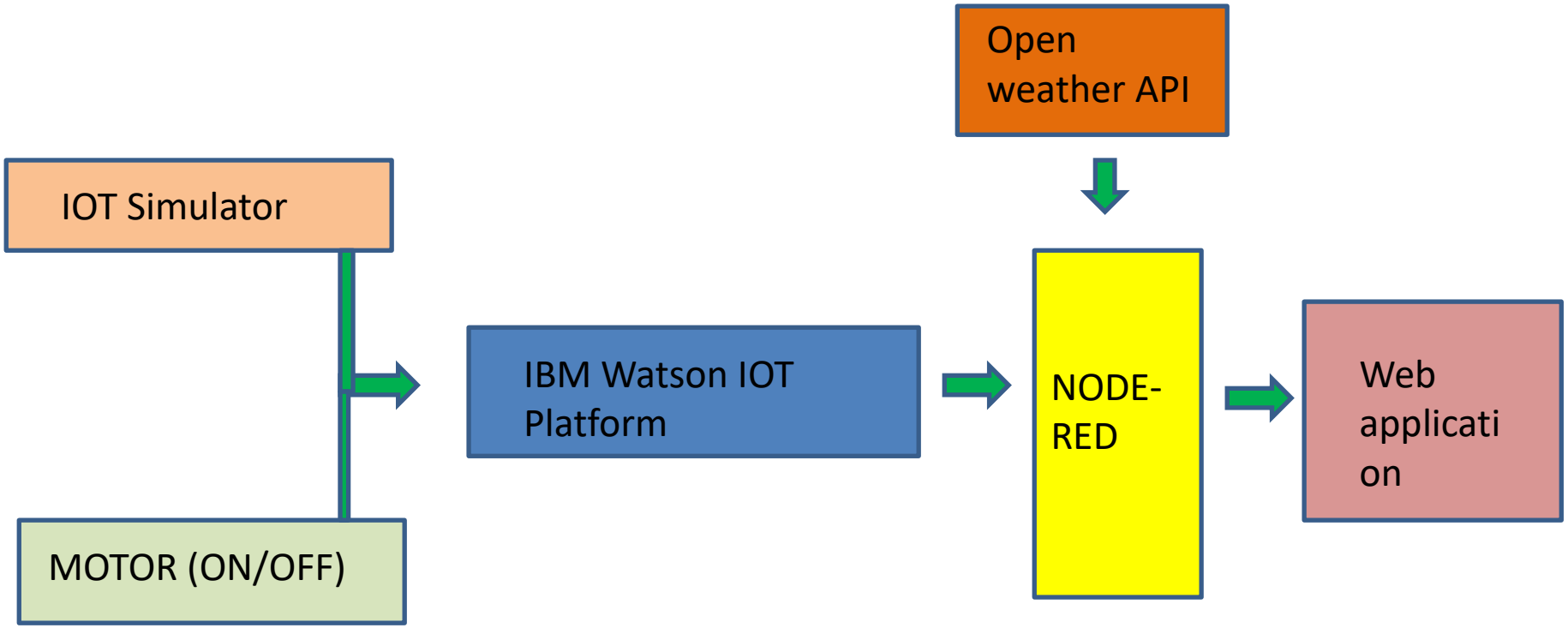
Introduction

The project aims to build a Smart Agriculture System based on IoT that can monitor soil moisture and climatic conditions to grow and yield a good crop. The farmer can also get the realtime weather forecasting data by using external platforms like Open Weather API. Farmer is provided a mobile app using which he can monitor the temperature, humidity and soil moisture parameters along with weather forecasting details.

Based on all the parameters he can water his crop by controlling the motors using the mobile application. Even if the farmer is not present near his crop he can water his crop by controlling the motors using the mobile application from anywhere. Here we are using the Online IoT simulator for getting the Temperature, Humidity and Soil Moisture values.

Project Requirements

- IBM Cloud account
- Nodered installed locally
- Python IDLE
- Python coding
- IOT Simulator
- Open weather API
- Github account


Open weather API
IOT Simulator
IBM Watson IOT Platform
NODE-RED
Web applicati on
MOTOR (ON/OFF)

Building Of The Project

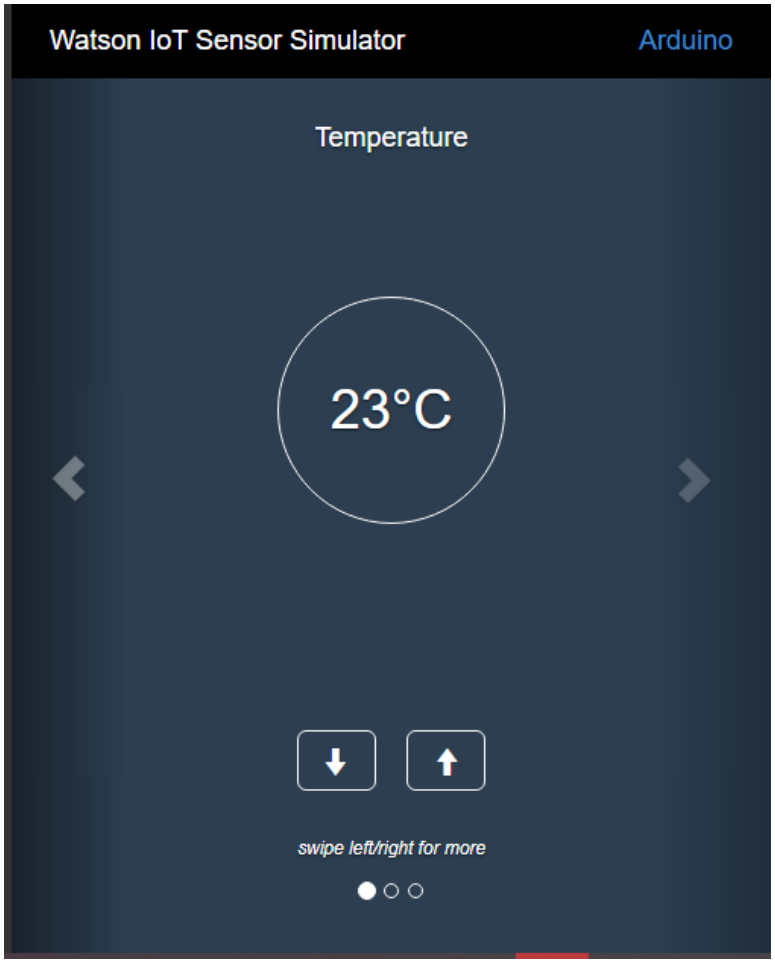
- For this project to be working we require:

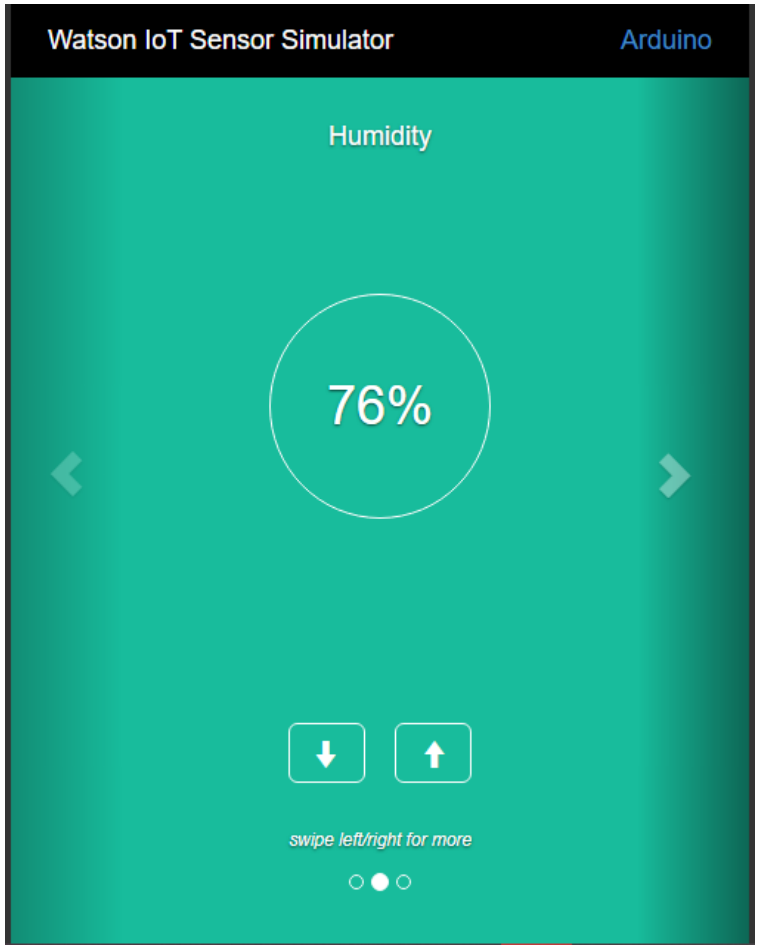
1)Data from sensors(temperature, humidity, soil moisture etc)

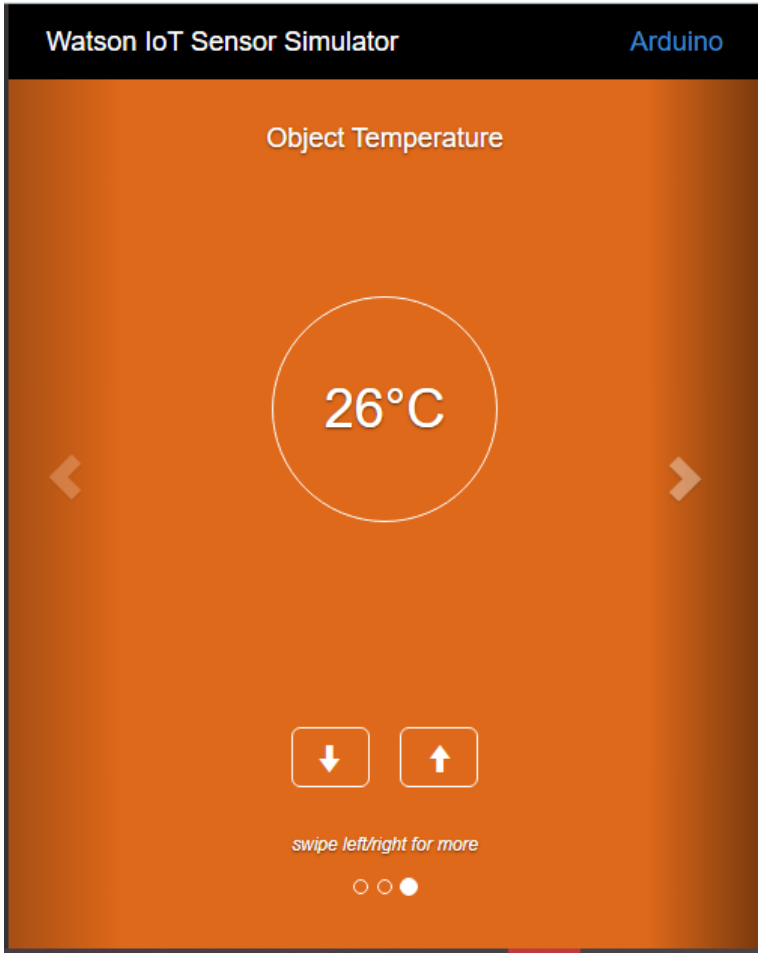
2)Present weather conditions.

- The data of sensors we generated using IBM IOT sensor simulator.

- The present weather data we got from Open weather API.


Watson IoT Sensor Simulator
Arduino
Temperature
23°C
swipe left/right for more


Watson IoT Sensor Simulator
Arduino
Humidity
76%
swipe left/right for more


Watson IoT Sensor Simulator
Arduino
Object Temperature
26°C
swipe left/right for more

Historical weather for any location

Our new technology, Time Machine, has allowed us to enhance the data in the Historical Weather Collection.

- Historical weather data available for **ANY** coordinate
- The depth of historical data have been extended to **40 YEARS**

You can download data from Personal account or contact us to order it. The price is highly competitive - only **10$** per location!

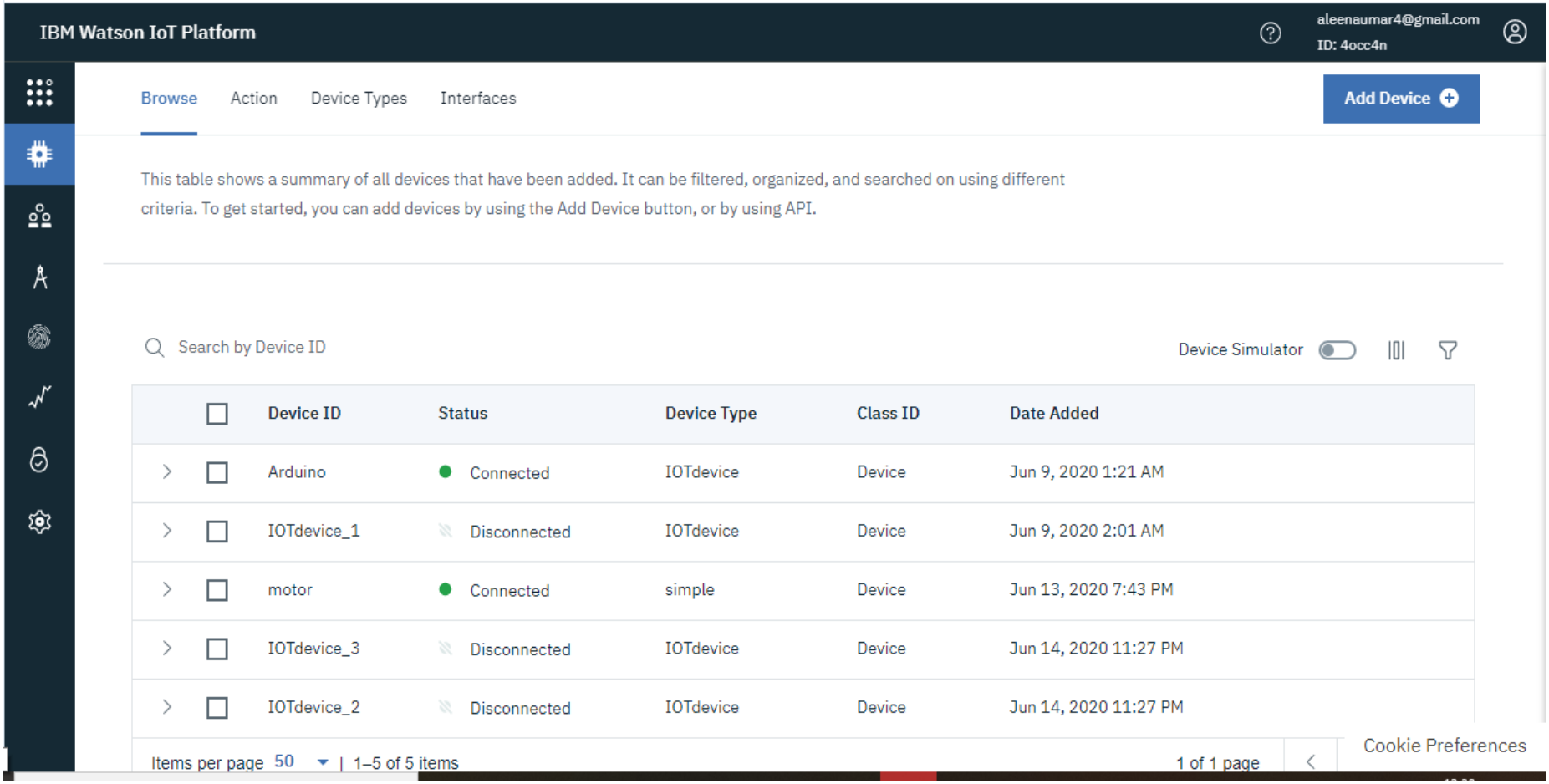
Learn more Go to purchase

Dashboard and Agro API

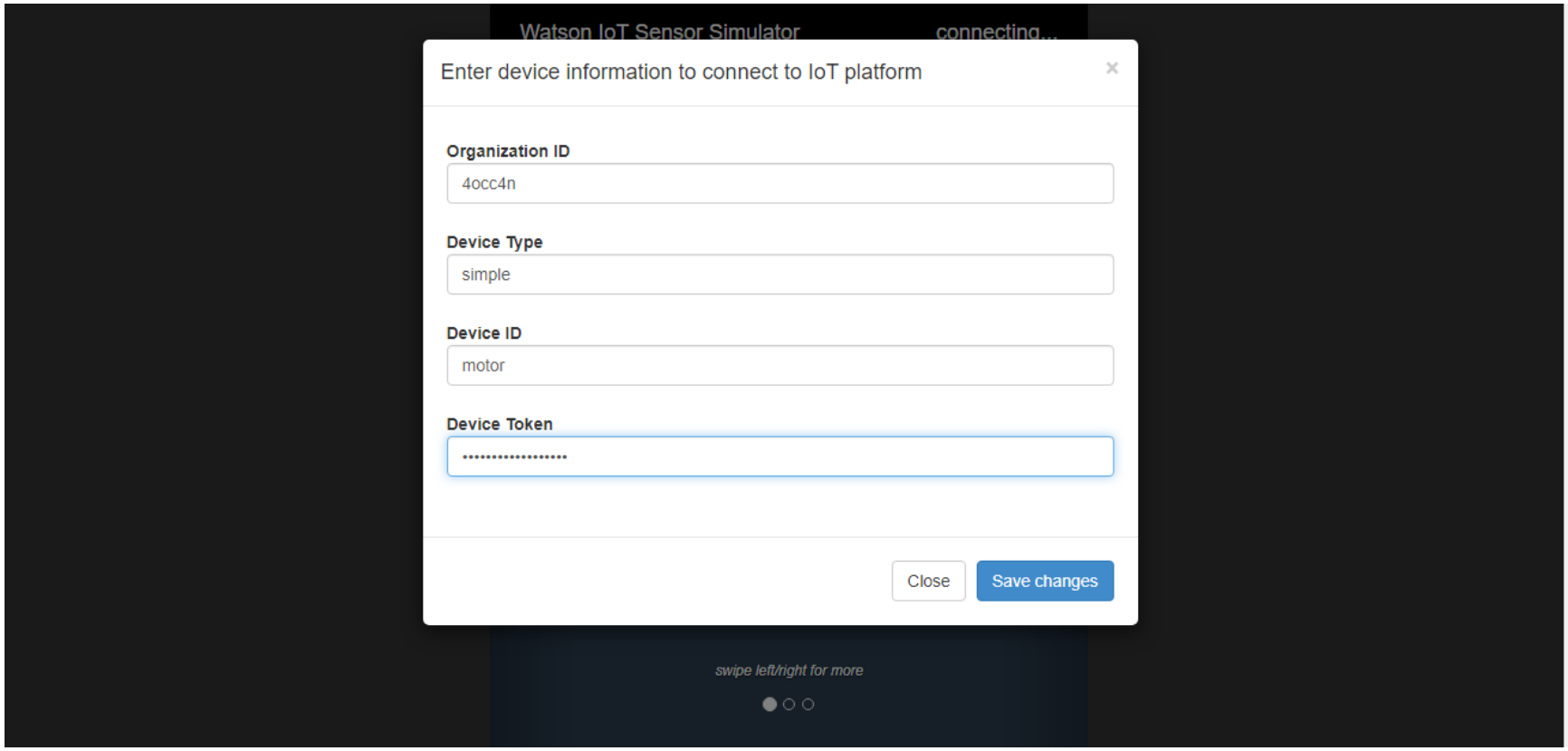
Agro API allows getting satellite imagery, weather data and other agricultural services that are based on geodata. Dashboard is a visual service for working with satellite imagery and weather

{"coord":{"lon":77.23,"lat":28.61},"weather":[{"id":721,"main":"Haze","description":"haze","icon":"50d"}],"base":"stations","main":
{"temp":309.15,"feels_like":310.64,"temp_min":309.15,"temp_max":309.15,"pressure":1001,"humidity":41},"visibility":4000,"wind":{"speed":3.6,"deg":270},"clouds":
{"all":0},"dt":1592196668,"sys":{"type":1,"id":9165,"country":"IN","sunrise":1592178780,"sunset":1592229017},"timezone":19800,"id":1261481,"name":"New Delhi","cod":200}

- For this we made an account on IBM Cloud.
- Created two devices.
- Connected them by entering the credentials at IOT sensor simultor.
- For weather forcasting data we created an account on Open weather API.



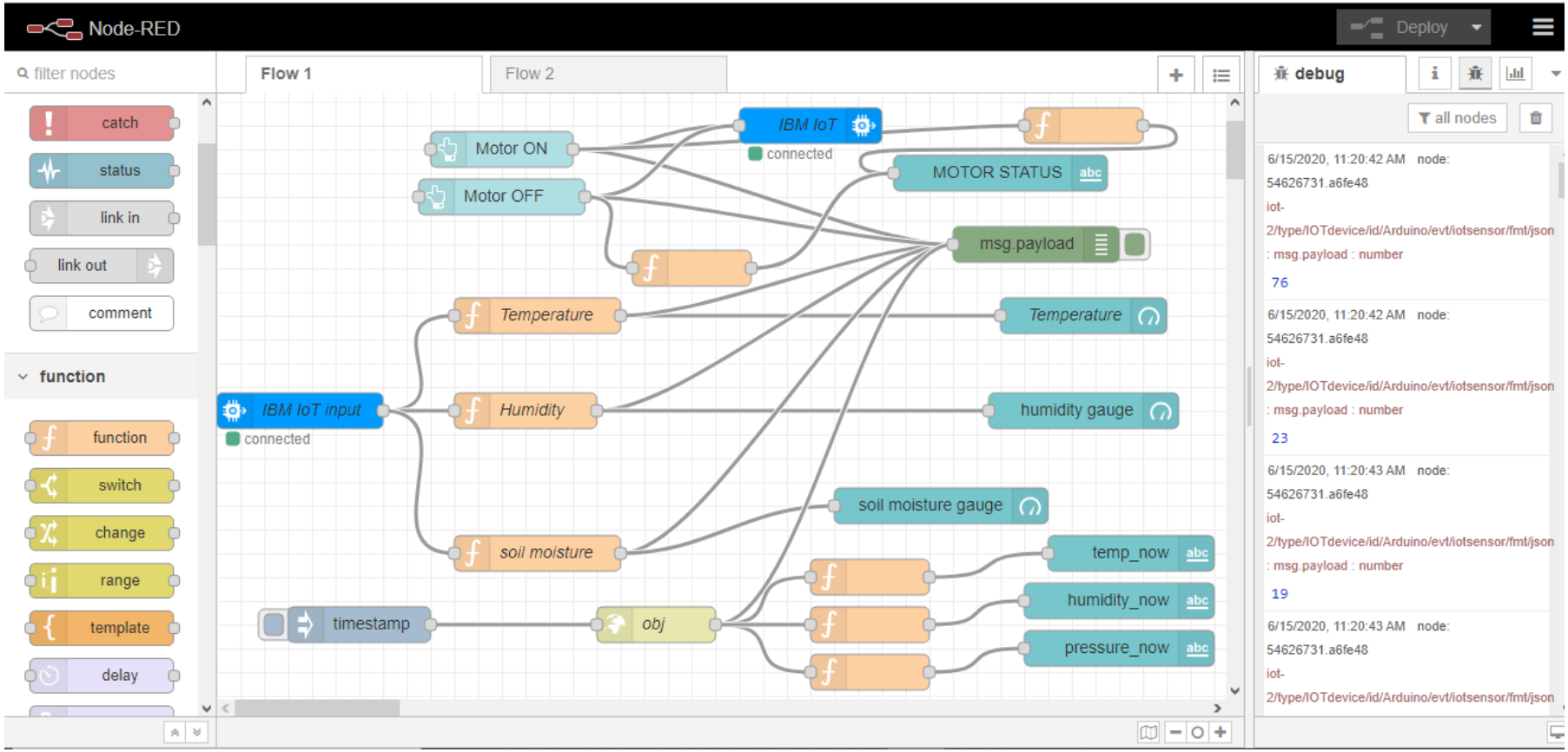
The two devices I used were – Arduino and motor as shown connected


Watson IoT Sensor Simulator
connecting...
Enter device information to connect to IoT platform
Organization ID
4occ4n
Device Type
simple
Device ID
motor
Device Token
Close
Save changes
swipe left/right for more

Web Application UI

- The web application UI was created using Node-RED.
- Node-RED is a programming tool for wiring together hardware devices, APIs and online services in new and interesting ways. It provides a browser-based editor that makes it easy to wire together flows using the wide range of nodes in the palette that can be deployed to its runtime in a single-click.

Node-RED flow

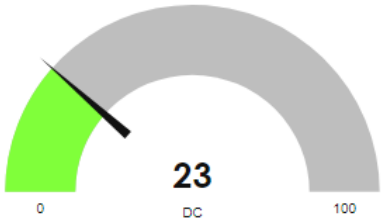


Web Application

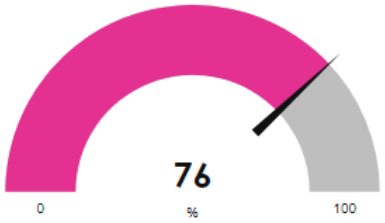
WEATHER DATA

Sensor Data

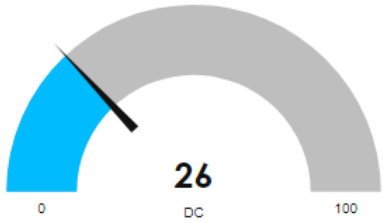
temperature-gauge



humidity gauge



soil moisture gauge



MOTOR ON

MOTOR OFF

MOTOR STATUS	**motor on**
temp_now	**310.15**
humidity_now	**39**
pressure_now	**1001**

Advantages & Future Scope

- It will make the work of farmers easy and convenient as well as
- It will increase the probability of the healthy crop.
- It will reduce the labor work.
- Farmers no more need to go to fields to check the parameters and operate the motors as they will be able to receive the data and operate while sitting home through web app.

Conclusion

The IOT based smart agriculture system has high efficiency and accuracy in procuring live data of humidity, temperature, soil moisture. The report generated from this will be of great assistance to farmers and largely to the whole food production and related industries