CODING AND SOLUTIONING

TEAM ID	PNT2022TMID24852
PROJECT NAME	IOT BASED SMART CROP PROTECTION SYSTEM FOR AGRICULTURE
DATE	18/11/2022

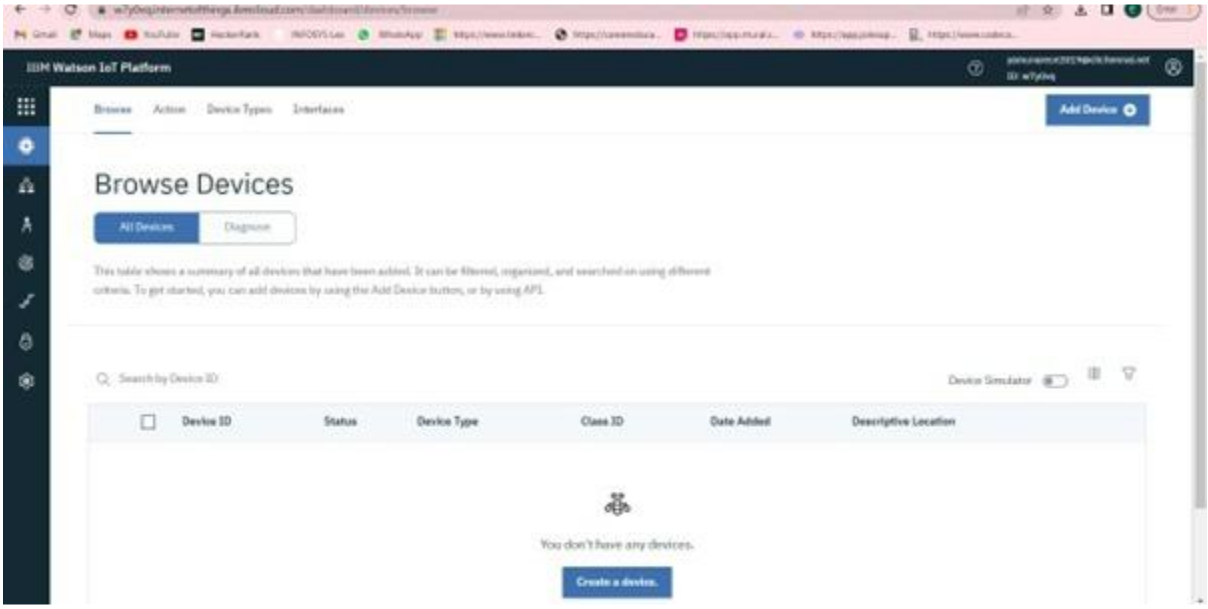
A Web Application is built which consists of,

- Graphical representation of Humidity, Temperature and Soil Moisture
- Motor ON and Motor OFF Step 1: Generate random values of Humidity, Temperature, Soil Moisture are generated from events in the Watson IOT platform. These sensor values are generated using random functions from the events that is used in the device which was created.

Step 1:

Generate random values of Humidity, Temperature, Soil Moisture are generated from events in the Watson IOT platform. These sensor values are generated using random functions from the events that is used in the device which was created

PAYLOADS	SENSORS
Temp	Temperature
Hum	Humidity
Moist	Moisture

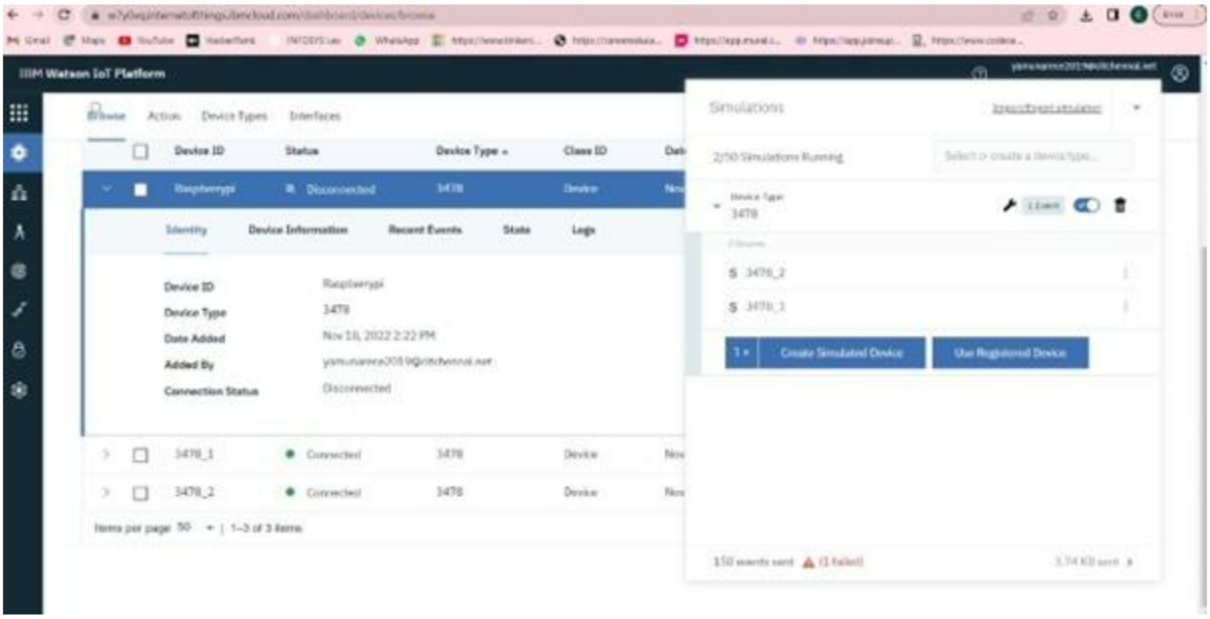


Browse Devices

This table shows a summary of all devices that have been added. It can be filtered, organized, and searched on using different criteria. To get started, you can add devices by using the Add Device button, or by using API.

□	Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location

You don't have any devices.



IBM Watson IoT Platform

Browse Action Device Types Interfaces

	Device ID	Status	Device Type	Class ID
□	Raspberrypi	Disconnected	3478	Device
□	3478_1	● Connected	3478	Device
□	3478_2	● Connected	3478	Device

Identity Device Information Recent Events State Logs

Device ID	Raspberrypi
Device Type	3478
Date Added	Nov 18, 2022 2:22 PM
Added By	[illegible]
Connection Status	Disconnected

Items per page 50 | 1–3 of 3 items

Simulations

2/50 Simulations Running

Device Type 3478

$ 3478_2

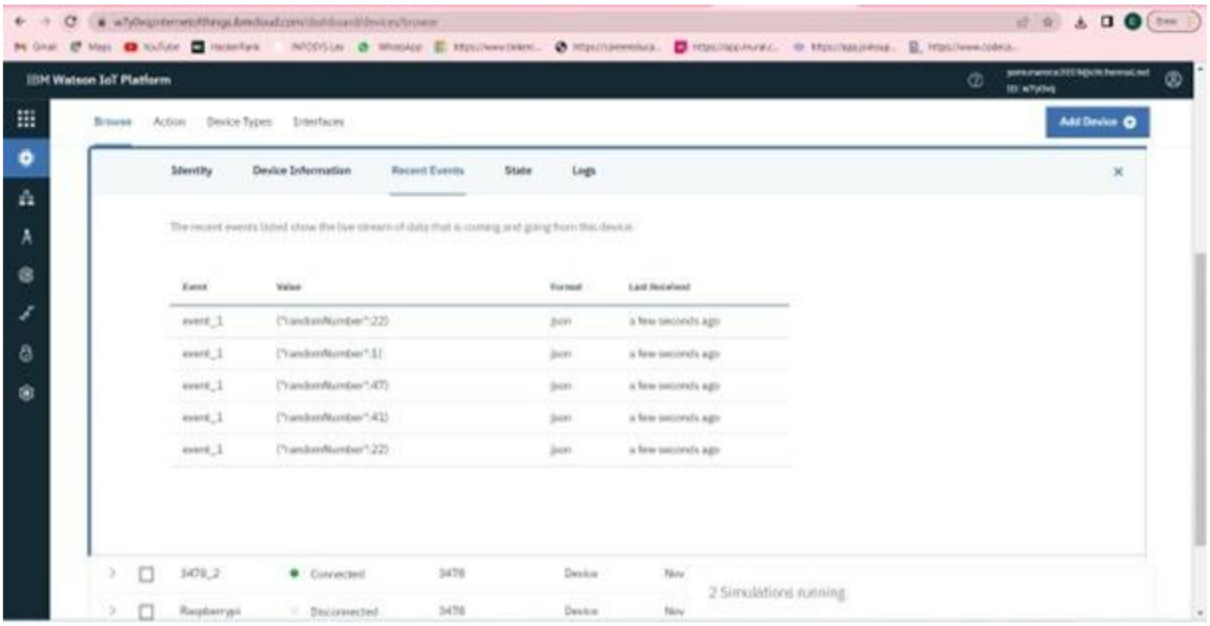
$ 3478_1

Create Simulated Device Use Registered Device

150 events sent (1 failed) 3.74 KB sent

Step 2:

The values are generated for every minute as payload from events in the form of json format in the recent events of the device created in Watson Platform



IBM Watson IoT Platform

Browse Action Device Types Interfaces Add Device

Identity Device Information Recent Events State Logs

The recent events listed show the live stream of data that is coming and going from this device.

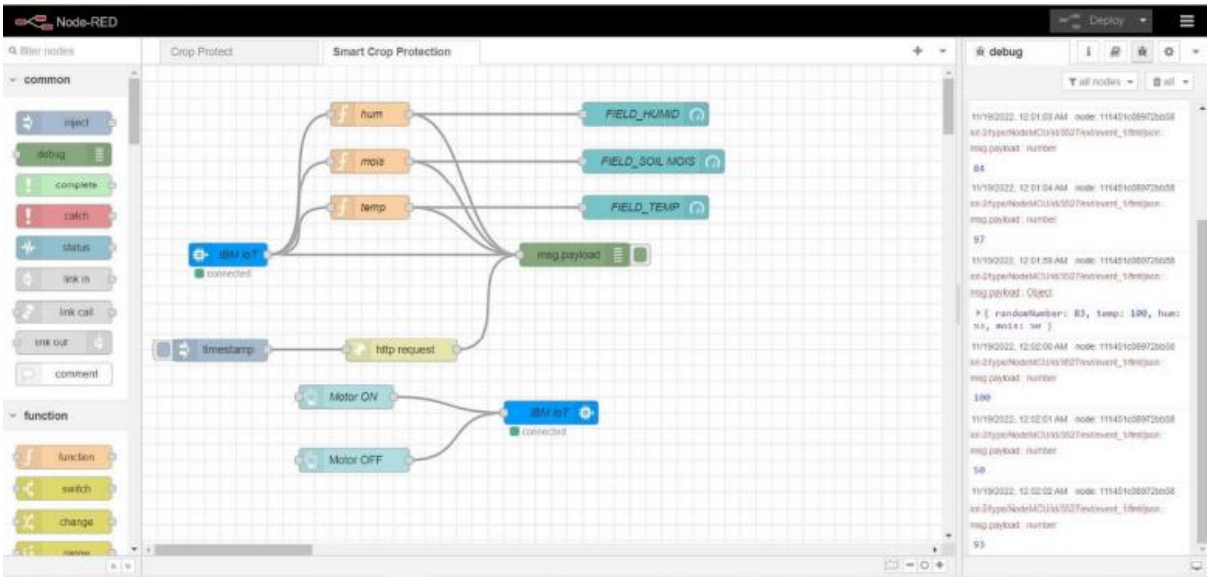
Event	Value	Format	Last Received
event_1	{"randomNumber":22}	json	a few seconds ago
event_1	{"randomNumber":1}	json	a few seconds ago
event_1	{"randomNumber":47}	json	a few seconds ago
event_1	{"randomNumber":41}	json	a few seconds ago
event_1	{"randomNumber":22}	json	a few seconds ago

□	3478_2	● Connected	3478	Device
□	Raspberrypi	Disconnected	3478	Device

2 Simulations running

Step 3:

Node-RED is an editor used to create the flow between the nodes and has to be deployed once the flow has been made. Once deployment is done sensor values can be viewed in detail



```
11/19/2022, 12:01:03 AM   node: 115451c08972bb58
iot-2/type/NodeMCU/id/3527/evt/event_1/fmt/json :
msg.payload : number
84
11/19/2022, 12:01:04 AM   node: 115451c08972bb58
iot-2/type/NodeMCU/id/3527/evt/event_1/fmt/json :
msg.payload : number
97
11/19/2022, 12:01:59 AM   node: 115451c08972bb58
iot-2/type/NodeMCU/id/3527/evt/event_1/fmt/json :
msg.payload : Object
 ▸{ randomNumber: 83, temp: 100, hum:
93, mois: 50 }
11/19/2022, 12:02:00 AM   node: 115451c08972bb58
iot-2/type/NodeMCU/id/3527/evt/event_1/fmt/json :
msg.payload : number
100
11/19/2022, 12:02:01 AM   node: 115451c08972bb58
iot-2/type/NodeMCU/id/3527/evt/event_1/fmt/json :
msg.payload : number
50
11/19/2022, 12:02:02 AM   node: 115451c08972bb58
iot-2/type/NodeMCU/id/3527/evt/event_1/fmt/json :
msg.payload : number
93
```

Step 4:

The Smart Crop dashboard is viewed once the deployment is completed where we can able to view,

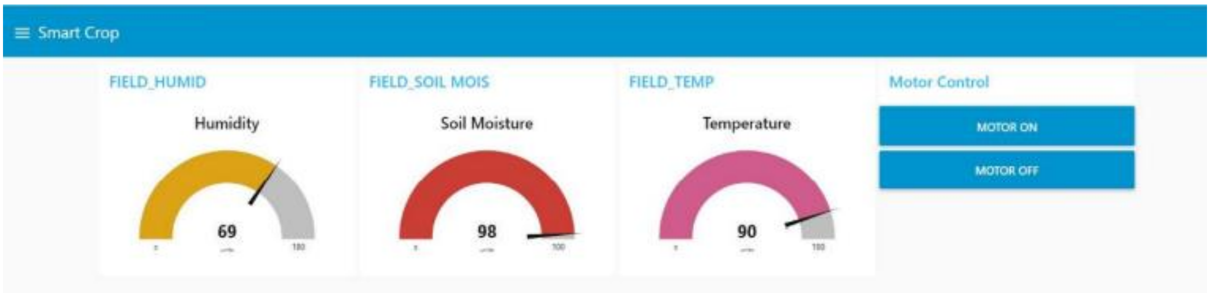
1. Moisture in the form of gauge

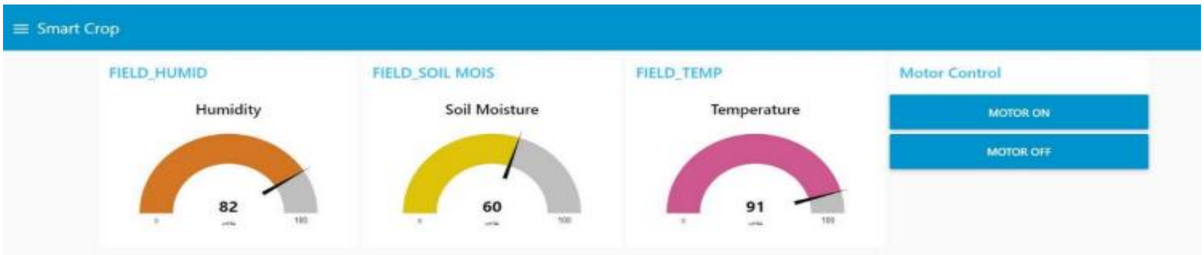
2. Temperature and Humidity in the form of gauge 3. MOTOR ON and MOTOR OFF buttons

Details:

1. Dashboard is named as Smart Crop

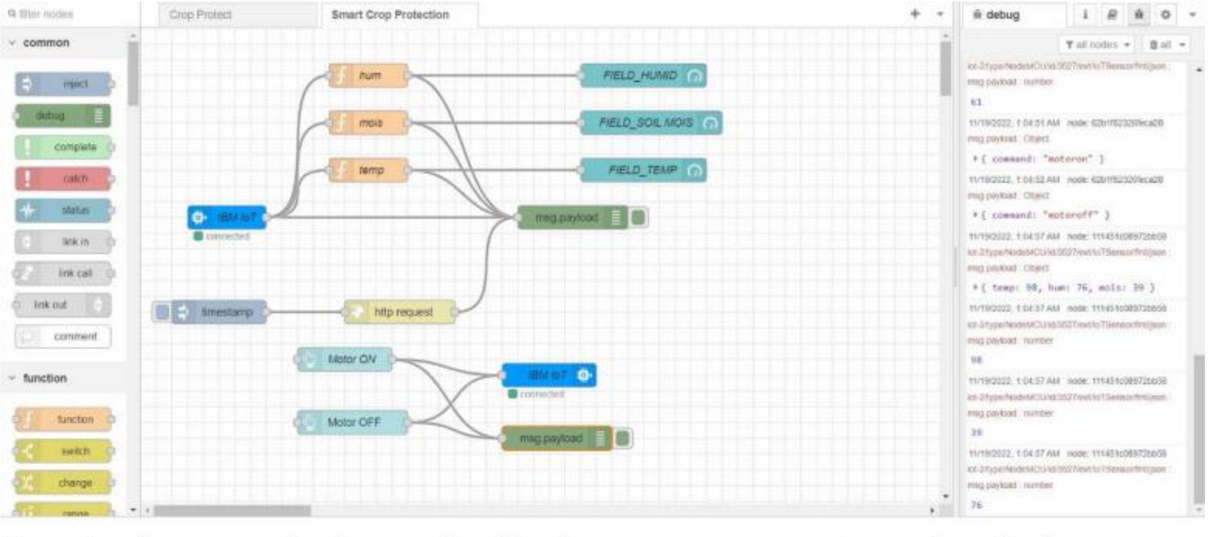
2. Section is named as Field In the section of Field, the sensors values are represented and motor control buttons are also given





Step 5:

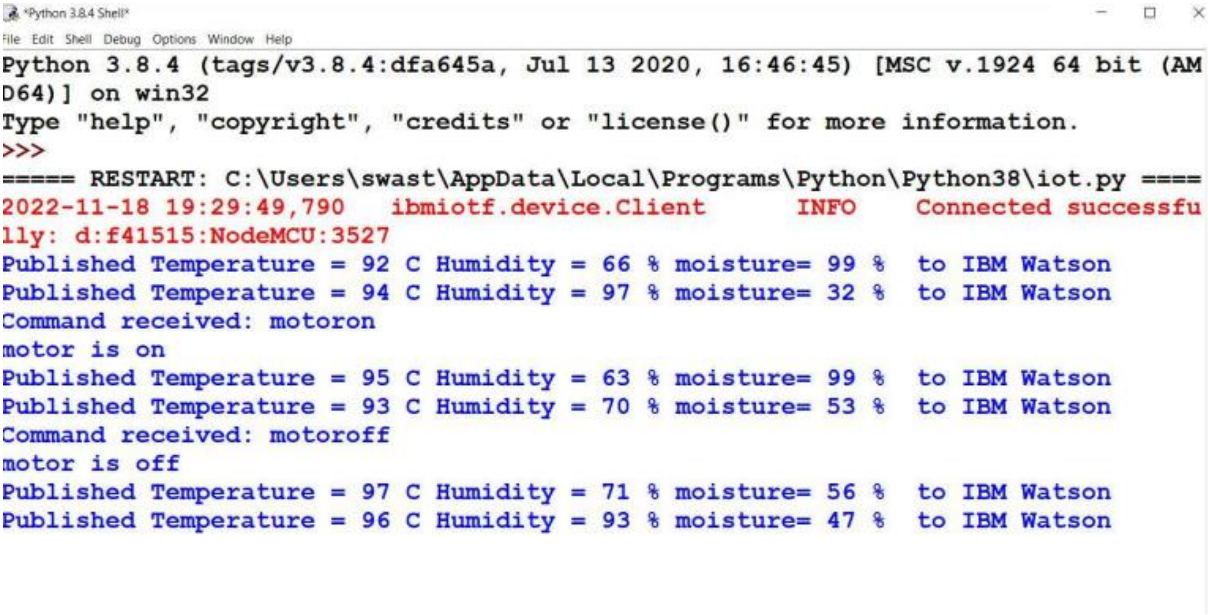
When the Motor ON button is clicked the we receive the output as “motoron” and Motor OFF button is clicked we receive the output as “motoroff”. And these outputs are received in the debug section of the editor



```
iot-2/type/NodeMCU/id/3527/evt/IoTSensor/fmt/json :
msg.payload : number
61
11/19/2022, 1:04:51 AM  node: 62b1f823269eca28
msg.payload : Object
▸{ command: "motoron" }
11/19/2022, 1:04:52 AM  node: 62b1f823269eca28
msg.payload : Object
▸{ command: "motoroff" }
11/19/2022, 1:04:57 AM  node: 111451c08972bb38
iot-2/type/NodeMCU/id/3527/evt/IoTSensor/fmt/json :
msg.payload : Object
▸{ temp: 98, hum: 76, mois: 39 }
11/19/2022, 1:04:57 AM  node: 111451c08972bb38
iot-2/type/NodeMCU/id/3527/evt/IoTSensor/fmt/json :
msg.payload : number
98
11/19/2022, 1:04:57 AM  node: 111451c08972bb38
iot-2/type/NodeMCU/id/3527/evt/IoTSensor/fmt/json :
msg.payload : number
39
11/19/2022, 1:04:57 AM  node: 111451c08972bb38
iot-2/type/NodeMCU/id/3527/evt/IoTSensor/fmt/json :
msg.payload : number
76
```

Step 6:

The output is also received in the python code editor when the buttons are clicked in the dashboard and random values are also generated. Device id is used to connect to IBM Watson.



```
Python 3.8.4 (tags/v3.8.4:dfa645a, Jul 13 2020, 16:46:45) [MSC v.1924 64 bit (AM
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:\Users\swast\AppData\Local\Programs\Python\Python38\iot.py ====
2022-11-18 19:29:49,790   ibmiotf.device.Client      INFO    Connected successfu
lly: d:f41515:NodeMCU:3527
Published Temperature = 92 C Humidity = 66 % moisture= 99 %  to IBM Watson
Published Temperature = 94 C Humidity = 97 % moisture= 32 %  to IBM Watson
Command received: motoron
motor is on
Published Temperature = 95 C Humidity = 63 % moisture= 99 %  to IBM Watson
Published Temperature = 93 C Humidity = 70 % moisture= 53 %  to IBM Watson
Command received: motoroff
motor is off
Published Temperature = 97 C Humidity = 71 % moisture= 56 %  to IBM Watson
Published Temperature = 96 C Humidity = 93 % moisture= 47 %  to IBM Watson
```