

### SPRINT - 3

Date	12 November 2022
Team ID	PNT2022TMID47454
Project Name	SMART FARMER-IOT ENABLED SMART FARMING APPLICATION
Maximum Marks	20 marks

US-1	Develop a python Script to publish random sensor data such as temperature, moisture,soil and humidity to the IBM IoT platform
US-2	After developing python code,commands are received just print the statement which represent the control of the devices.
US-3	Publish Data to the IBM Cloud

#### **PYTHON CODE :**

```
import time
```

```
import sys
```

```
import ibmiotf.application
```

```
import ibmiotf.device
```

```
import random
```

```
#Provide your IBM Watson Device Credentials
```

```
organization = "7um9ms"
```

```
deviceType = "PNTRTEAM454567"
```

```
deviceId = "DEVICE454567"
```

```
authMethod = "token"
```

```
authToken = "2bB!y?GuCED9(8THRD"
```

```
# Initialize GPIO
```

```
def myCommandCallback(cmd):
```

```

print("Command received: %s" % cmd.data['command'])
status=cmd.data['command']
if status=="motoron":
    print ("motor is on")
else :
    print ("motor is off")
#print(cmd)

try:
    deviceOptions = {"org": organization, "type": deviceType, "id": deviceId, "auth-
method": authMethod, "auth-token": authToken}

    deviceCli = ibmiotf.device.Client(deviceOptions)

    #.....

except Exception as e:
    print("Caught exception connecting device: %s" % str(e))
    sys.exit()

# Connect and send a datapoint "hello" with value "world" into the cloud as an event of type
"greeting" 10 times
deviceCli.connect()

while True:
    #Get Sensor Data from DHT11

    soil=random.randint(0,100)
    temp=random.randint(0,100)
    hum=random.randint(0,100)

```

```

data = { 'soil moisture': soil, 'temperature':temp, 'humidity':hum}

#print data

def myOnPublishCallback():

    print ( "Published Soil Moisture = %s %" % soil,"Temperature = %s C" % temp,
"Humidity = %s %" % hum, "to IBM Watson")

    success = deviceCli.publishEvent("IoTSensor", "json", data, qos=0,
on_publish=myOnPublishCallback)

    if not success:

        print("Not connected to IoTF")

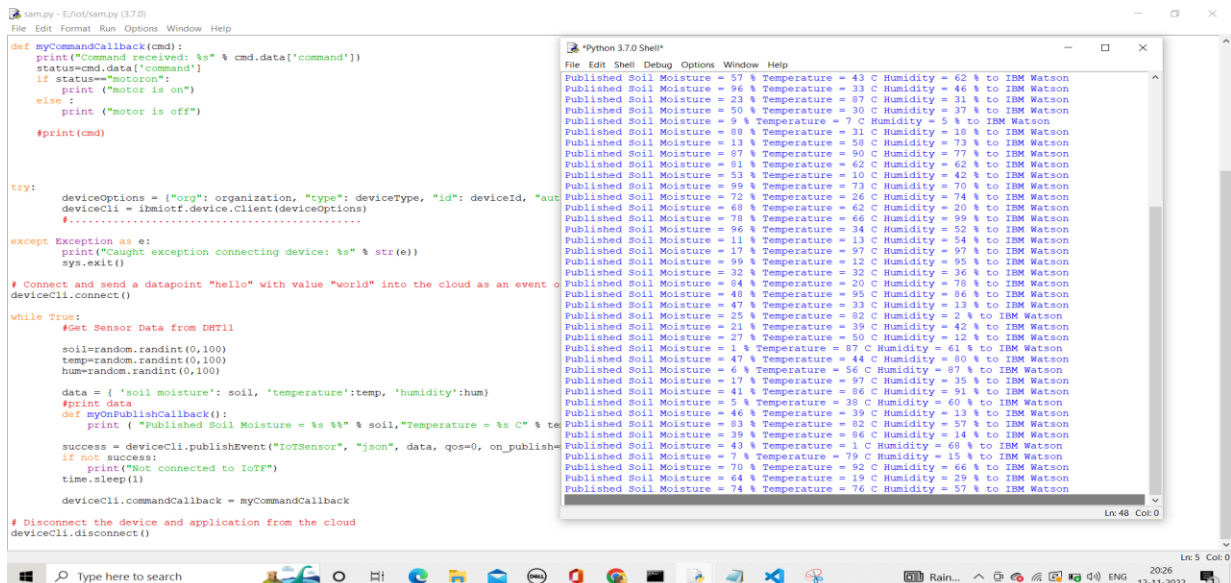
    time.sleep(1)

deviceCli.commandCallback = myCommandCallback

# Disconnect the device and application from the cloud
deviceCli.disconnect()

```

## OUTPUT :



```

File Edit Shell Debug Options Window Help
Python 3.7.0 Shell
Published Soil Moisture = 57 % Temperature = 43 C Humidity = 62 % to IBM Watson
Published Soil Moisture = 96 % Temperature = 33 C Humidity = 46 % to IBM Watson
Published Soil Moisture = 23 % Temperature = 87 C Humidity = 31 % to IBM Watson
Published Soil Moisture = 50 % Temperature = 30 C Humidity = 37 % to IBM Watson
Published Soil Moisture = 9 % Temperature = 7 C Humidity = 5 % to IBM Watson
Published Soil Moisture = 88 % Temperature = 31 C Humidity = 18 % to IBM Watson
Published Soil Moisture = 13 % Temperature = 58 C Humidity = 73 % to IBM Watson
Published Soil Moisture = 87 % Temperature = 90 C Humidity = 77 % to IBM Watson
Published Soil Moisture = 81 % Temperature = 62 C Humidity = 62 % to IBM Watson
Published Soil Moisture = 53 % Temperature = 10 C Humidity = 42 % to IBM Watson
Published Soil Moisture = 78 % Temperature = 66 C Humidity = 99 % to IBM Watson
Published Soil Moisture = 96 % Temperature = 34 C Humidity = 52 % to IBM Watson
Published Soil Moisture = 11 % Temperature = 13 C Humidity = 54 % to IBM Watson
Published Soil Moisture = 17 % Temperature = 97 C Humidity = 97 % to IBM Watson
Published Soil Moisture = 99 % Temperature = 12 C Humidity = 95 % to IBM Watson
Published Soil Moisture = 32 % Temperature = 32 C Humidity = 36 % to IBM Watson
Published Soil Moisture = 84 % Temperature = 20 C Humidity = 78 % to IBM Watson
Published Soil Moisture = 48 % Temperature = 95 C Humidity = 86 % to IBM Watson
Published Soil Moisture = 47 % Temperature = 33 C Humidity = 13 % to IBM Watson
Published Soil Moisture = 25 % Temperature = 82 C Humidity = 2 % to IBM Watson
Published Soil Moisture = 21 % Temperature = 39 C Humidity = 42 % to IBM Watson
Published Soil Moisture = 27 % Temperature = 50 C Humidity = 12 % to IBM Watson
Published Soil Moisture = 1 % Temperature = 87 C Humidity = 61 % to IBM Watson
Published Soil Moisture = 47 % Temperature = 44 C Humidity = 80 % to IBM Watson
Published Soil Moisture = 6 % Temperature = 56 C Humidity = 87 % to IBM Watson
Published Soil Moisture = 17 % Temperature = 97 C Humidity = 35 % to IBM Watson
Published Soil Moisture = 41 % Temperature = 86 C Humidity = 91 % to IBM Watson
Published Soil Moisture = 5 % Temperature = 38 C Humidity = 60 % to IBM Watson
Published Soil Moisture = 46 % Temperature = 39 C Humidity = 13 % to IBM Watson
Published Soil Moisture = 83 % Temperature = 82 C Humidity = 57 % to IBM Watson
Published Soil Moisture = 39 % Temperature = 86 C Humidity = 14 % to IBM Watson
Published Soil Moisture = 43 % Temperature = 1 C Humidity = 69 % to IBM Watson
Published Soil Moisture = 7 % Temperature = 79 C Humidity = 15 % to IBM Watson
Published Soil Moisture = 70 % Temperature = 92 C Humidity = 66 % to IBM Watson
Published Soil Moisture = 64 % Temperature = 19 C Humidity = 29 % to IBM Watson
Published Soil Moisture = 74 % Temperature = 76 C Humidity = 57 % to IBM Watson
Ln: 48 Col: 0
Ln: 5 Col: 0

```

# IBM Watson IoT Platform:

The screenshot shows the IBM Watson IoT Platform dashboard. The top navigation bar includes 'Browse', 'Action', 'Device Types', and 'Interfaces'. A search bar is present with the text 'Search by Device ID'. The main content area displays a table with columns: Device ID, Status, Device Type, Class ID, Date Added, and Descriptive Location. The first row shows 'DEVICE454567' with status 'Connected', device type 'PNTRTEAM454567', class ID 'Device', and date added 'Nov 1, 2022 4:19 PM'. Below the table, a modal window titled 'Identity' is open, showing details for the selected device. The details include: Device ID (DEVICE454567), Device Type (PNTRTEAM454567), Date Added (Nov 1, 2022 4:19 PM), Added By (910019106029@smartinternz.com), and Connection Status (Connected). The connection status details show a connection time of 'Nov 12, 2022 8:26 PM' and a client address of '223.181.221.183 SecureToken'. The bottom of the modal shows 'Items per page 50' and '1-1 of 1 item'.

Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
DEVICE454567	Connected	PNTRTEAM454567	Device	Nov 1, 2022 4:19 PM	

**Identity**

Device ID: DEVICE454567  
Device Type: PNTRTEAM454567  
Date Added: Nov 1, 2022 4:19 PM  
Added By: 910019106029@smartinternz.com  
Connection Status: **Connected**  
Connection Time: Nov 12, 2022 8:26 PM  
Client Address: 223.181.221.183 SecureToken

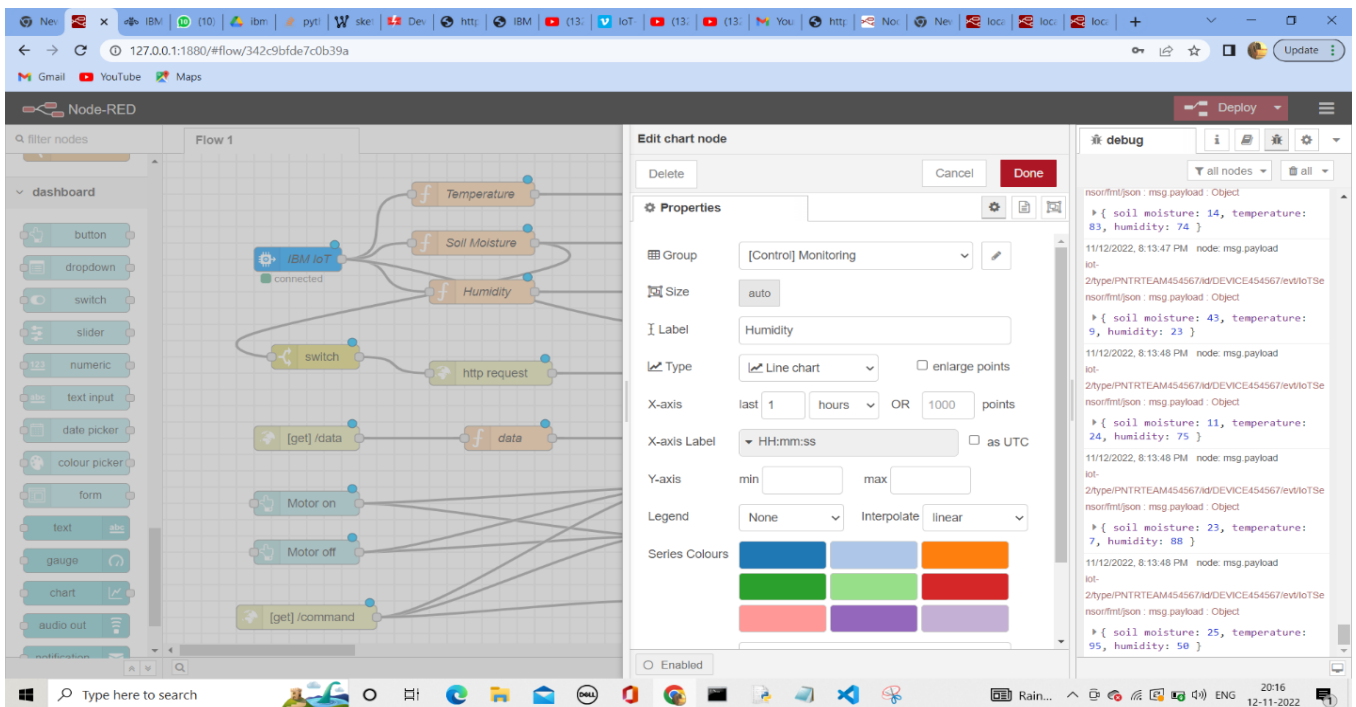
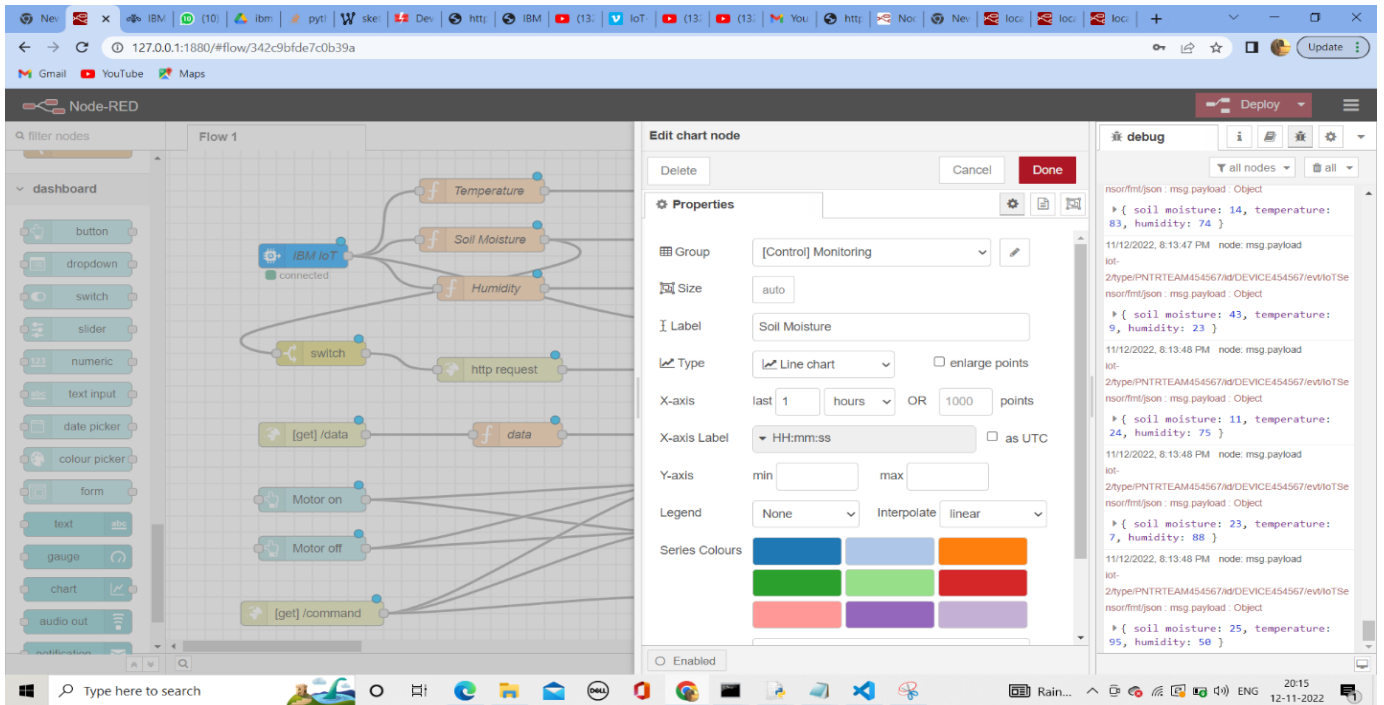
The screenshot shows the IBM Watson IoT Platform dashboard with the 'Recent Events' tab selected. The main content area displays a table with columns: Event, Value, Format, and Last Received. The table lists five recent events, all from 'IoTSensor' devices, showing a live stream of data. The events are as follows:

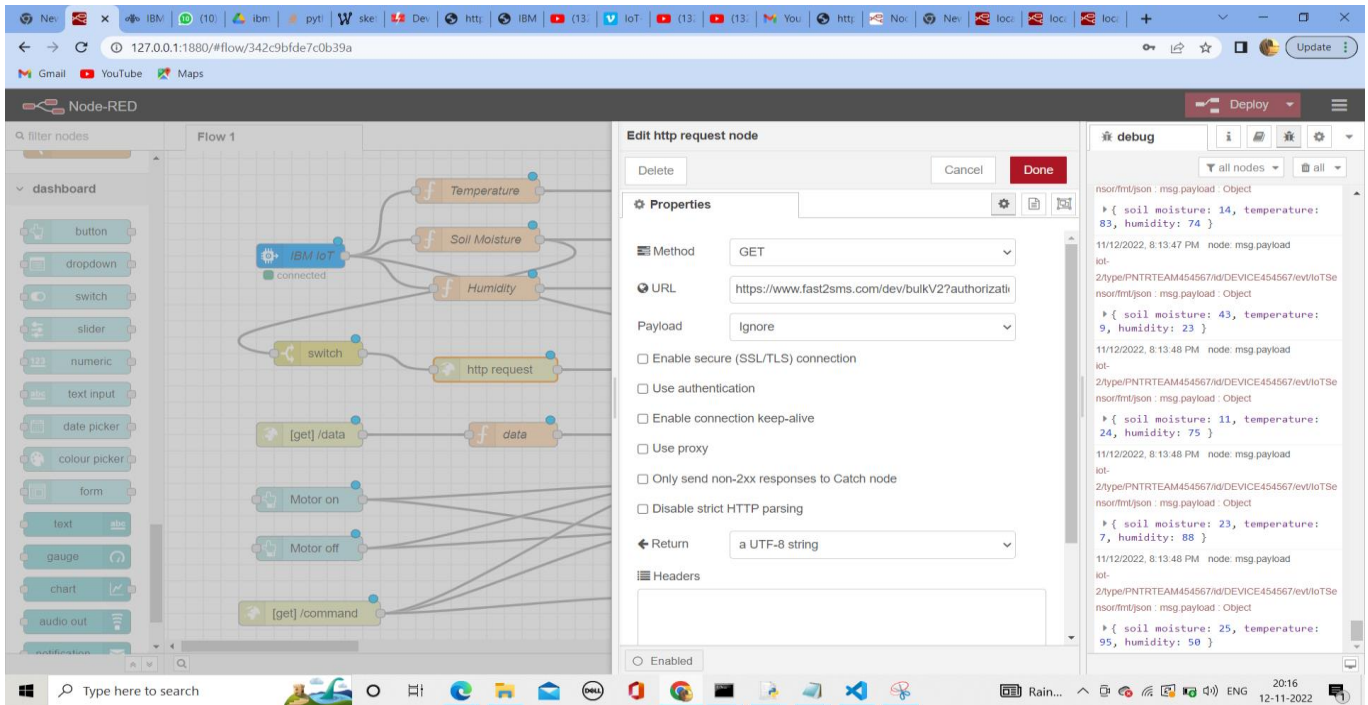
Event	Value	Format	Last Received
IoTSensor	{"soil moisture":37,"temperature":10,"humidity":...	json	a few seconds ago
IoTSensor	{"soil moisture":68,"temperature":86,"humidity":...	json	a few seconds ago
IoTSensor	{"soil moisture":16,"temperature":54,"humidity":...	json	a few seconds ago
IoTSensor	{"soil moisture":8,"temperature":22,"humidity":1...	json	a few seconds ago
IoTSensor	{"soil moisture":71,"temperature":47,"humidity":...	json	a few seconds ago

## Node-RED :

The screenshot shows the Node-RED web interface in a browser. The main workspace displays a flow named 'Flow 1'. The flow starts with an 'IBM IoT' node (connected) which branches into three function nodes: 'Temperature', 'Soil Moisture', and 'Humidity'. These function nodes connect to corresponding 'msg.payload' nodes. A 'switch' node is also connected to the 'Temperature' and 'Soil Moisture' nodes. The 'switch' node connects to an 'http request' node, which then connects to a 'msg.payload' node. Below this, there is a 'data' node connected to an 'http' node. At the bottom, there are two 'Motor on' and 'Motor off' nodes connected to an 'IBM IoT' node (connected) and a 'msg.payload' node. A '[get]/command' node is also connected to an 'http' node. The left sidebar shows a 'dashboard' tab with various widgets like button, dropdown, switch, slider, numeric, text input, date picker, colour picker, form, text, gauge, chart, and audio out. The right sidebar shows a 'debug' tab with a log of messages.

The screenshot shows the Node-RED web interface with the 'Edit gauge node' dialog box open. The dialog box has a 'Delete' button, 'Cancel' and 'Done' buttons, and a 'Properties' section. The 'Properties' section includes fields for 'Group' (set to '[Control] Monitoring'), 'Size' (set to 'auto'), 'Type' (set to 'Gauge'), 'Label' (set to 'Temperature'), 'Value format' (set to '{{value}}'), 'Units' (set to 'C'), 'Range' (min 0, max 100), 'Colour gradient' (a color bar), 'Sectors' (0, optional, optional, 100), 'Class' (Optional CSS class name(s) for widget), and 'Name'. The 'Enabled' checkbox is checked. The background shows the same flow as the first screenshot, but the 'debug' tab is now visible on the right, showing a log of messages.





## Controlling/Monitoring Output:

