

## PROJECT DEVELOPMENT PHASE

### SPRINT 2

Team Id	PNT2022TMID18648
Project Name	IOT Based Smart Crop protection System For Agriculture
Date	16 November 2022

**STEP 1:** Write a python code for randomize Soil Moisture ,Temperature and Humidity.

```
File Edit Format Run Options Window Help
import time
import sys
import ibmiotf.application
import ibmiotf.device
import random

# Provide your IBM Watson Device Credentials
organization = "myorg1" # replace the ORG ID
deviceType = "weather_station" # replace the Device type
deviceId = "10123456789" # replace Device ID
authMethod = "apikey"
authToken = "12345678901234567890" # replace the authToken

def myCommandCallback(cmd):
    print("Command received: %s" % cmd.data['command'])
    print(cmd)

if __name__ == '__main__':
    deviceOptions = {"org": organization, "type": deviceType, "id": deviceId, "auth-method": authMethod, "auth-token": authToken}
    deviceCli = ibmiotf.device.Client(deviceOptions)
    #.....

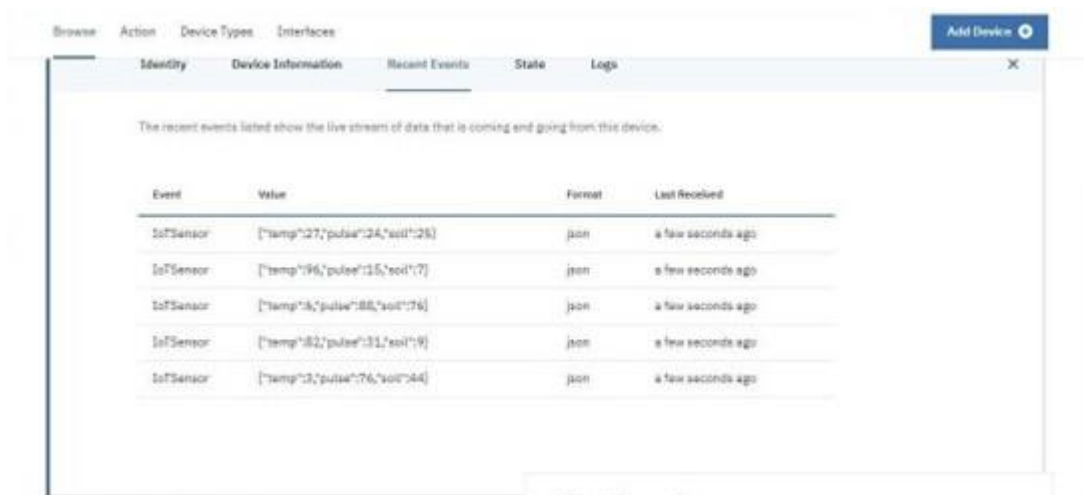
except Exception as e:
    print("Caught exception connecting device: %s" % str(e))
    sys.exit()

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

while True:
    temp=random.randint(10,100)
    pulse=random.randint(0,100)
    soil=random.randint(10,100)

    data = { 'temp': temp, 'pulse': pulse, 'soil':soil}
    print data
```

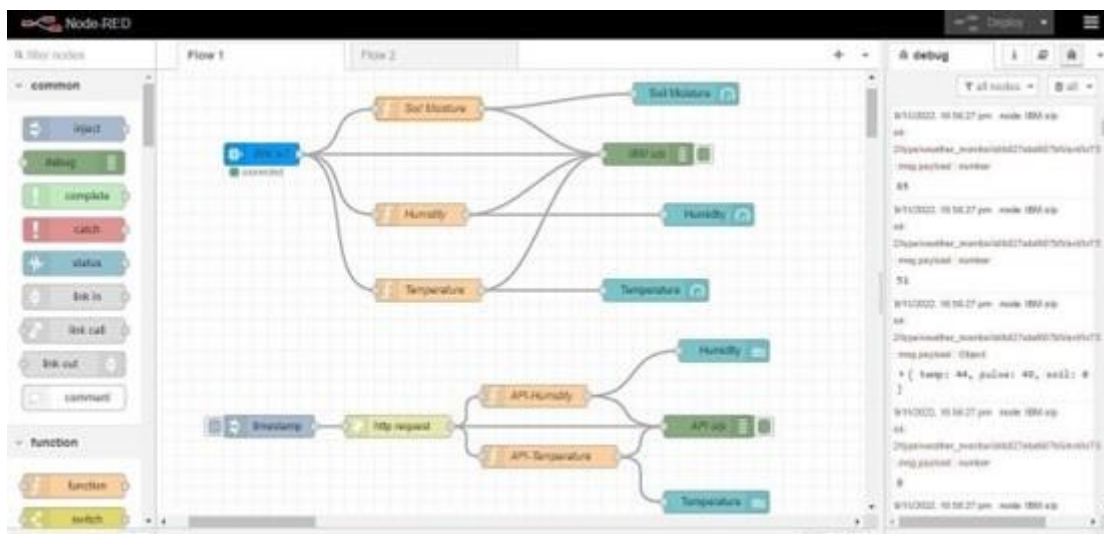
STEP 2: Run the python code it send data to IBM IoT Watson Platform.



The screenshot shows the IBM IoT Watson Platform interface. At the top, there are tabs for 'Identity', 'Device Information', 'Recent Events', 'State', and 'Logs'. The 'Recent Events' tab is selected. Below the tabs, there is a message: 'The recent events listed show the live stream of data that is coming and going from this device.' Below this message is a table with the following columns: 'Event', 'Value', 'Format', and 'Last Received'.

Event	Value	Format	Last Received
IoT Sensor	["temp":27,"pulse":24,"soil":26]	json	a few seconds ago
IoT Sensor	["temp":196,"pulse":15,"soil":7]	json	a few seconds ago
IoT Sensor	["temp":6,"pulse":88,"soil":76]	json	a few seconds ago
IoT Sensor	["temp":82,"pulse":31,"soil":9]	json	a few seconds ago
IoT Sensor	["temp":3,"pulse":76,"soil":44]	json	a few seconds ago

STEP 3: Open Node-RED flow dashboard.



STEP 4: Open Node-RED user interface to show the Soil Moisture, Humidity and Temperature value in gauge.



PYTHON CODE :

```
import time
```

```
import sys
```

```
import ibmiotf.application
```

```
import ibmiotf.device
```

```
import random
```

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

```
organization = "8gyz7t" # replace the ORG ID
```

```
deviceType = "weather_monitor" # replace the Device type
```

```
deviceId = "b827ebd607b5" # replace Device ID
```

```
authMethod = "token"
```

```
authToken = "LWVpQPaVQ166HWN48f" # Replace the authtoken
```

```

def myCommandCallback(cmd):
    print("Command received: %s" % cmd.data['command'])
    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:
    temp=random.randint(0,100)
    pulse=random.randint(0,100)
    soil=random.randint(0,100)

    data = { 'temp' : temp, 'pulse': pulse , 'soil':soil }
    #print data
    def myOnPublishCallback():

```

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

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

```
if not success:
```

```
    print("Not connected to IoT")
```

```
    time.sleep(1)
```

```
deviceCli.commandCallback = myCommandCallback
```

```
# Disconnect the device and application from the cloud
```

```
deviceCli.disconnect()
```

## **Node-RED :**

```
[{"id":"b42b5519fee73ee2","type":"ibmiot
in","z":"03acb6ae05a0c712","authentication":"apiKey","apiKey":"ef745d48e39
5ccc0","inputType":"evt","logicalInterface":"","ruleId":"","deviceId":"b827ebd
607b5","applicationId":"","deviceType":"weather_monitor","eventType":"+","c
ommandType":"","format":"json","name":"IBM
IoT","service":"registered","allDevices":"","allApplications":"","allDeviceType
s":"","allLogicalInterfaces":"","allEvents":true,"allCommands":"","allFormats":
"", "qos":0,"x":270,"y":180,"wires":[["50b13e02170d73fc","d7da6c2f5302ffaf",
"a949797028158f3f","a71f164bc378bcf1"]]}, {"id":"50b13e02170d73fc","type"
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Moisture","func":"msg.payload = msg.payload.soil;\nreturn
msg;","outputs":1,"noerr":0,"initialize":"","finalize":"","libs":[],"x":490,"y":120
,"wires":[["a949797028158f3f","ba98e701f55f04fe"]]}, {"id":"d7da6c2f5302ffa
f","type":"function","z":"03acb6ae05a0c712","name":"Humidity","func":"msg.
payload = msg.payload.pulse;\nreturn
msg;","outputs":1,"noerr":0,"initialize":"","finalize":"","libs":[],"x":480,"y":260
,"wires":[["a949797028158f3f","70a5b076eeb80b70"]]}, {"id":"a949797028158
f3f","type":"debug","z":"03acb6ae05a0c712","name":"IBM
```

```
o/p","active":true,"tosidebar":true,"console":false,"tostatus":false,"complete":"p
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,"wires":[]},{ "id":"70a5b076eeb80b70","type":"ui_gauge","z":"03acb6ae05a0c
712","name":"","group":"f4cb8513b95c98a4","order":6,"width":0,"height":0
,"gtype":"gage","title":"Humidity","label":"Percentage
(%)","format":{"value"},"min":0,"max":100,"colors":["#00b500","#e6e600
","#ca3838"],"seg1":"","seg2":"","className":"","x":860,"y":260,"wires":[]},{ "
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request","z":"03acb6ae05a0c712","name":"","method":"GET","ret":"obj","payt
oqs":"ignore","url":"http://api.openweathermap.org/data/2.5/weather?q=Chinch
wad,%20IN&appid=6aa2b89eb478ce7baebf384e671bfd15","tls":"","persist":fal
se,"proxy":"","authType":"","senderr":false,"x":450,"y":540,"wires":[["f7c149a
3169164e8","c2e6d49c5aa44698","6d207fb212acdac3"]]],{"id":"d55b317d0ec
9acfc","type":"inject","z":"03acb6ae05a0c712","name":"","props":[{"p":"paylo
ad"}, {"p":"topic","vt":"str"}],"repeat":"","crontab":"","once":false,"onceDelay":
0.1,"topic":"","payload":"","payloadType":"date","x":280,"y":540,"wires":[["b9
832c19b922be3e"]]],{"id":"6d207fb212acdac3","type":"debug","z":"03acb6ae0
5a0c712","name":"API
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ayload","targetType":"msg","statusVal":"","statusType":"auto","x":860,"y":540
,"wires":[]},{ "id":"f7c149a3169164e8","type":"function","z":"03acb6ae05a0c7
12","name":"API-
Humidity","func":"msg.payload=msg.payload.main.pulse;\nreturn
msg;","outputs":1,"noerr":0,"initialize":"","finalize":"","libs":[],"x":630,"y":500
,"wires":[["6d207fb212acdac3","23e82e5991b96c8d"]]],{"id":"c2e6d49c5aa44
698","type":"function","z":"03acb6ae05a0c712","name":"API-
Temperature","func":"msg.payload=msg.payload.main.temp;\nreturn
msg;","outputs":1,"noerr":0,"initialize":"","finalize":"","libs":[],"x":650,"y":580
,"wires":[["6d207fb212acdac3","3e9b68204bef0552"]]],{"id":"a71f164bc378bc
f1","type":"function","z":"03acb6ae05a0c712","name":"Temperature","func":"
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msg;","outputs":1,"noerr":0,"initialize":"","finalize":"","libs":[],"x":490,"y":360
,"wires":[["8e8b63b110c5ec2d","a949797028158f3f"]]],{"id":"8e8b63b110c5e
c2d","type":"ui_gauge","z":"03acb6ae05a0c712","name":"","group":"f4cb8513
b95c98a4","order":11,"width":0,"height":0,"gtype":"gage","title":"Tempera
ture","label":"Degree
Celcius","format":{"value"},"min":0,"max":100,"colors":["#00b500","#e6e
600","#ca3838"],"seg1":"","seg2":"","className":"","x":790,"y":360,"wires":[]
},{ "id":"3e9b68204bef0552","type":"ui_text","z":"03acb6ae05a0c712","group":
"f4cb8513b95c98a4","order":2,"width":0,"height":0,"name":"","label":"Te
```

```
mperature","format":"{{msg.payload}}","layout":"row-
spread","className":"","x":870,"y":640,"wires":[]},{ "id":"23e82e5991b96c8d"
,"type":"ui_text","z":"03acb6ae05a0c712","group":"f4cb8513b95c98a4","order
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yload}}","layout":"row-
spread","className":"","x":880,"y":440,"wires":[]},{ "id":"ba98e701f55f04fe",
"type":"ui_gauge","z":"03acb6ae05a0c712","name":"","group":"f4cb8513b95c9
8a4","order":1,"width":"0","height":"0","gtype":"gage","title":"Soil
Moisture","label":"Percentage
(%)","format":"{{value}}","min":0,"max":100,"colors":["#00b500","#e6e600
","#ca3838"],"seg1":"","seg2":"","className":"","x":830,"y":100,"wires":[]},{ "
id":"ef745d48e395ccc0","type":"ibmiot","name":"weather_monitor","keepalive
":"60","serverName":"","cleansession":true,"appId":"","shared":false},{ "id":"f4
cb8513b95c98a4","type":"ui_group","name":"monitor","tab":"1f4cb829.2fdee8
","order":2,"disp":true,"width":"6","collapse":false,"className":""},{ "id":"1f4c
b829.2fdee8","type":"ui_tab","name":"Home","icon":"dashboard","order":3,"di
sabled":false,"hidden":false}]
```