SPRINT-2

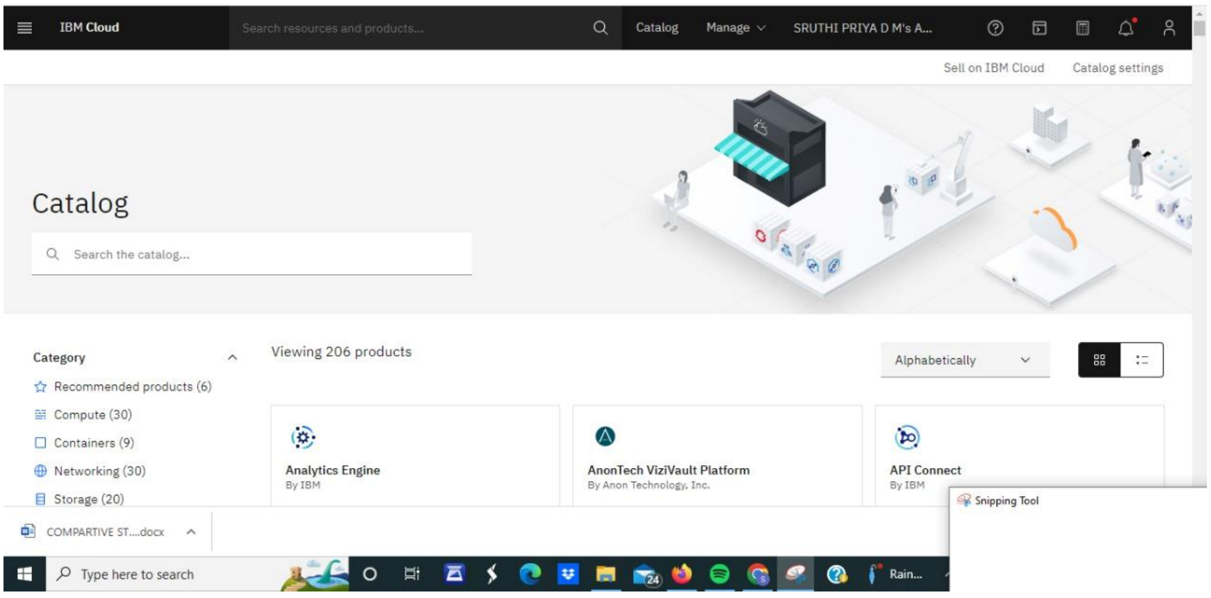
TEAM ID: PNT2022TMID54441

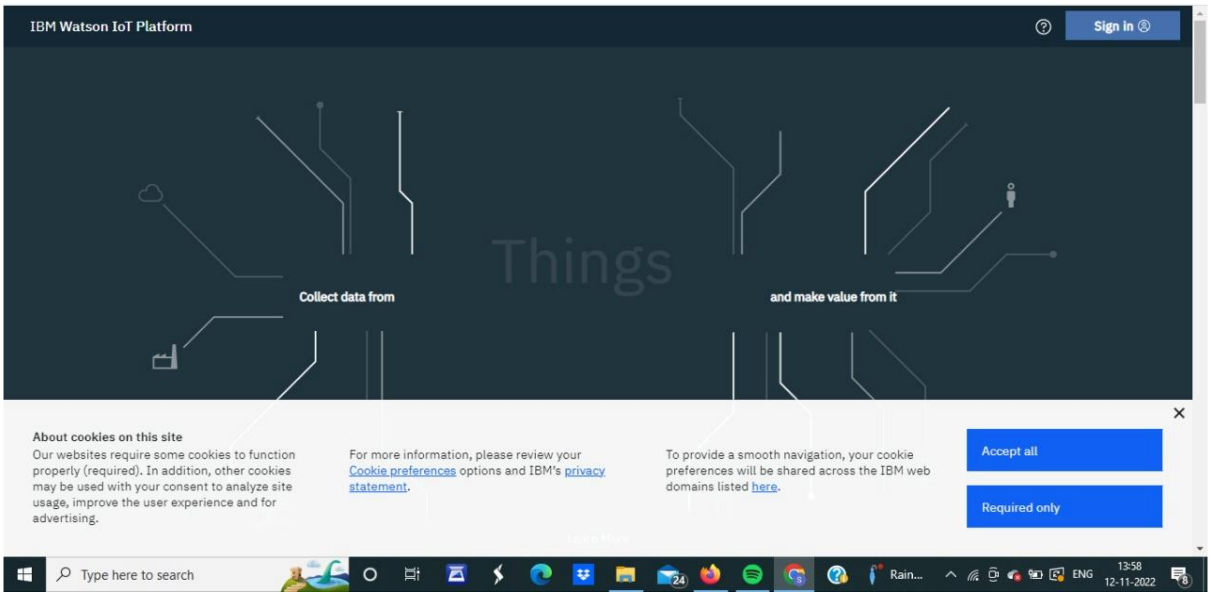
PROJECT NAME : IoT based smart crop protection system for Agriculture

STEPS:

The random sensor data’s are generated and automation has been implemented through the python code instead of using hardware to implement IOT based crop protection system. And the python code need to upload the data’s in IBM cloud are written in this python script.

CREATION OF IBM WATSON CLOUD PLATFROM:




IBM Watson IoT Platform

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Collect data from Things and make value from it

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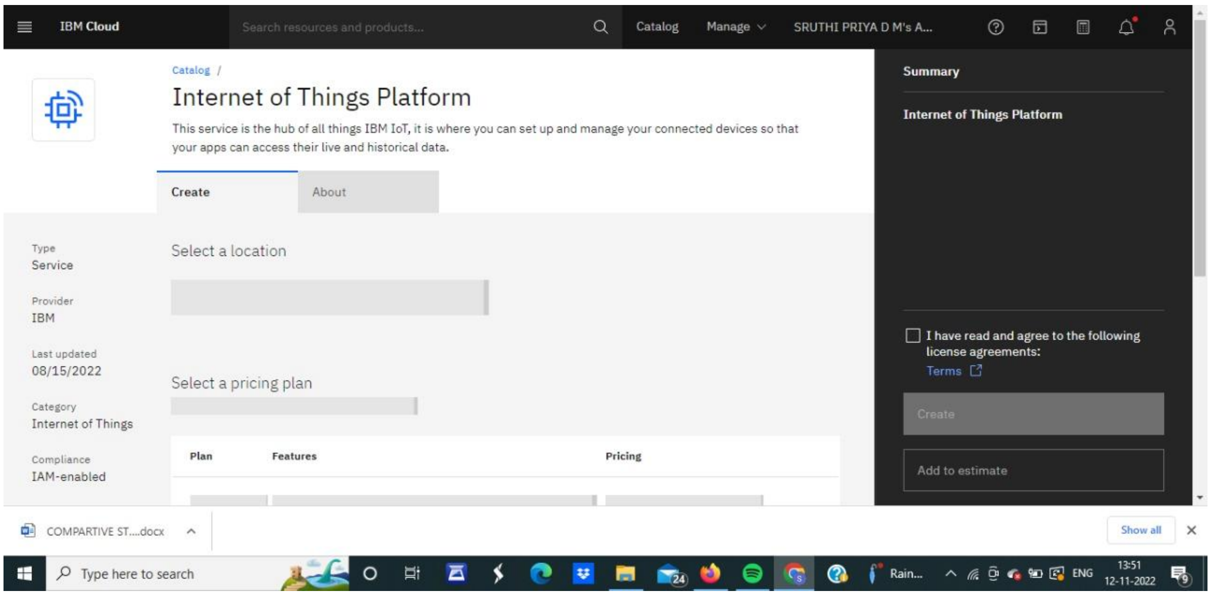
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Internet of Things Platform

This service is the hub of all things IBM IoT, it is where you can set up and manage your connected devices so that your apps can access their live and historical data.

Create About

Type
Service

Provider
IBM

Last updated
08/15/2022

Category
Internet of Things

Compliance
IAM-enabled

Select a location

Select a pricing plan

Plan	Features	Pricing

Summary

Internet of Things Platform

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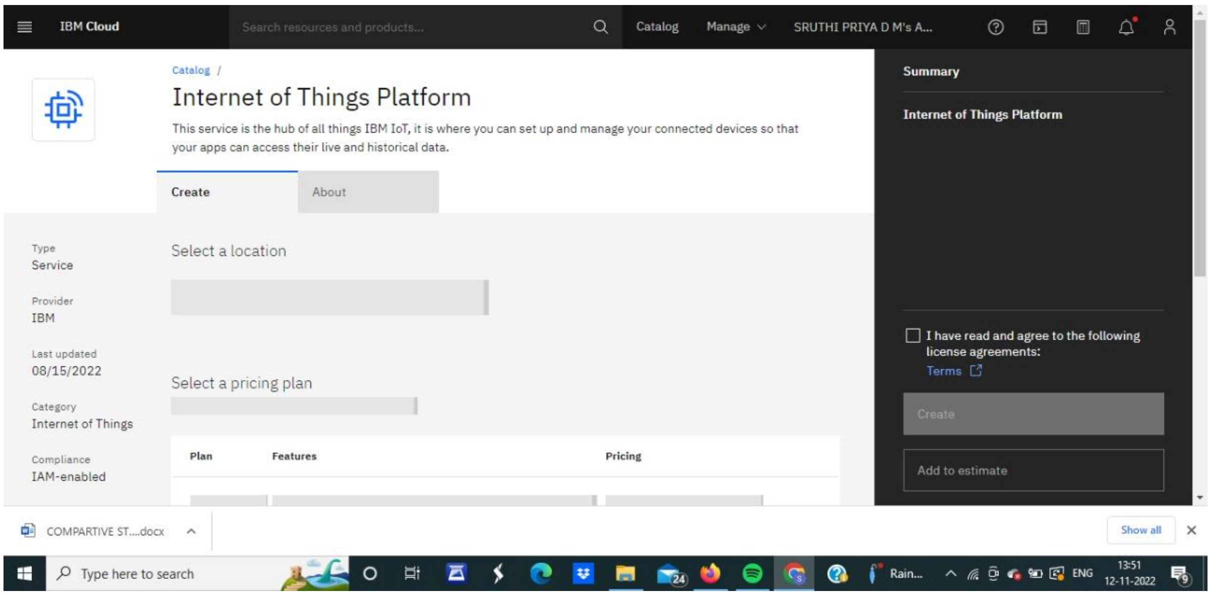
Create

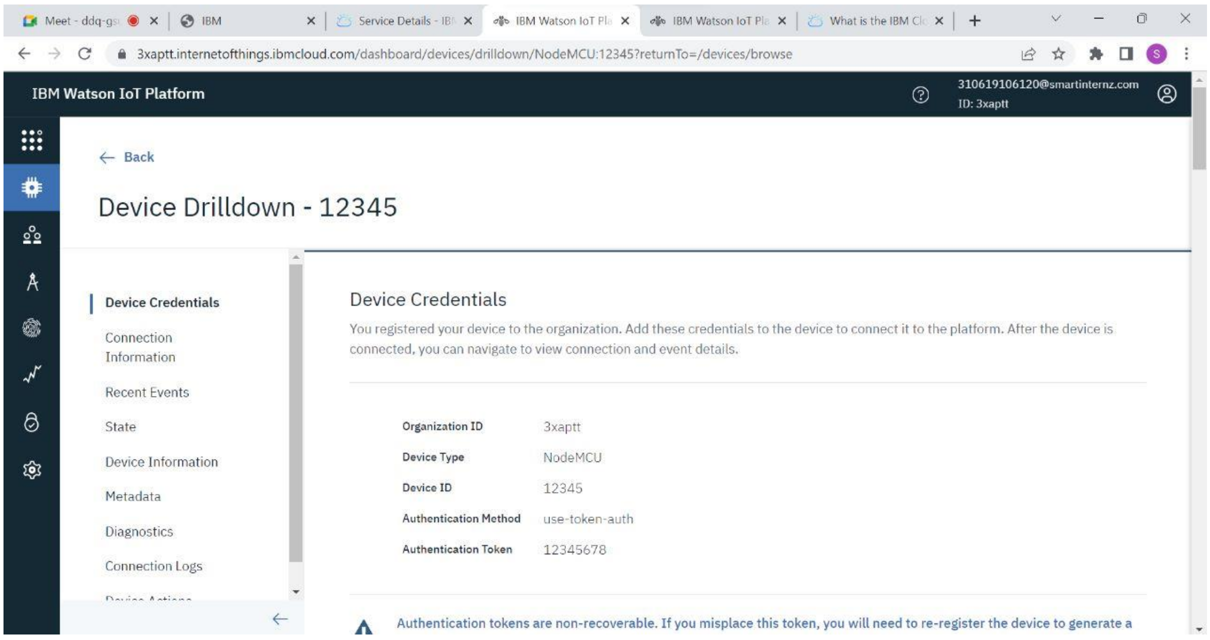
Add to estimate



Internet of Things Platform

This service is the hub of all things IBM IoT, it is where you can set up and manage your connected devices so that your apps can access their live and historical data.

Type	Service
Provider	IBM
Last updated	08/15/2022
Category	Internet of Things
Compliance	IAM-enabled


Meet - ddq-gs
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Service Details - IBM
IBM Watson IoT Pla
IBM Watson IoT Pla
What is the IBM Cl
3xaptt.internetofthings.ibmcloud.com/dashboard/devices/drilldown/NodeMCU:12345?returnTo=/devices/browse
IBM Watson IoT Platform
310619106120@smartinternz.com
ID: 3xaptt
Back

Device Drilldown - 12345

Device Credentials

You registered your device to the organization. Add these credentials to the device to connect it to the platform. After the device is connected, you can navigate to view connection and event details.

Organization ID	3xaptt
Device Type	NodeMCU
Device ID	12345
Authentication Method	use-token-auth
Authentication Token	12345678

Authentication tokens are non-recoverable. If you misplace this token, you will need to re-register the device to generate a

CODE:

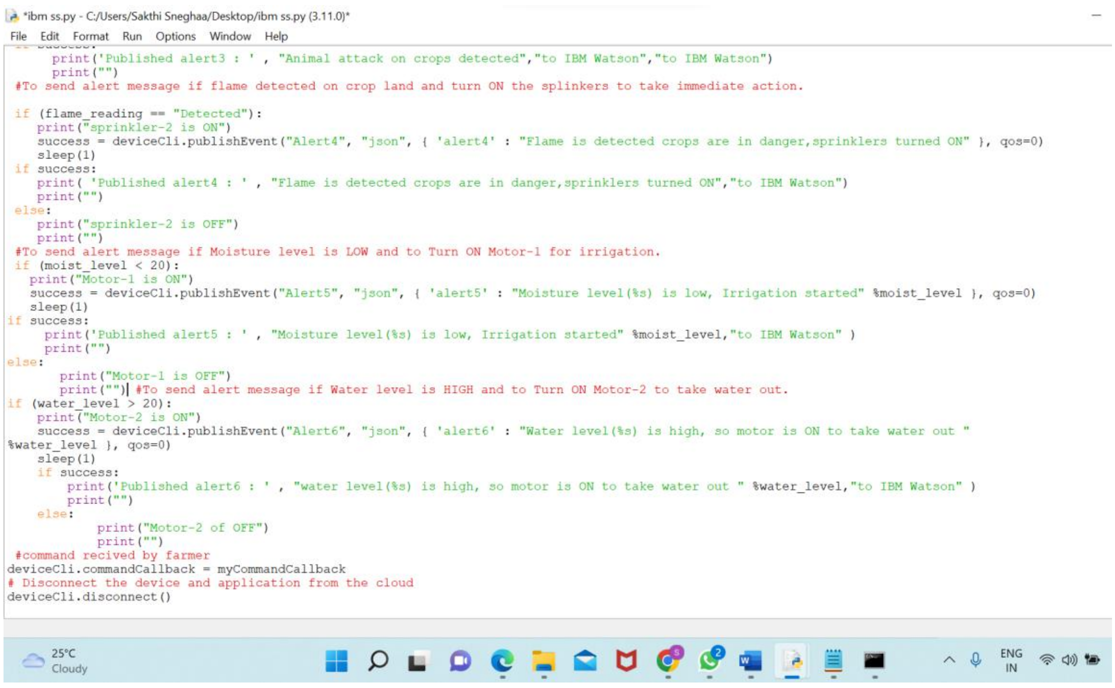
```
import random
import ibmiotf.application
import ibmiotf.device
from time import sleep
```

```
import sys
#IBM Watson Device Credentials.
organization = "3xaptt"
deviceType = "NodeMCU"
deviceId = "12345"
authMethod = "use-token-auth"
authToken = "12345678"
def myCommandCallback(cmd):
    print("Command received: %s" % cmd.data['command'])
    status=cmd.data['command']
    if status=="sprinkler_on":
        print ("sprinkler is ON")
    else :
        print ("sprinkler 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()
#Connecting to IBM watson.
deviceCli.connect()
while True:
#Getting values from sensors.
 temp_sensor = round( random.uniform(0,80),2)
 PH_sensor = round(random.uniform(1,14),3)
 camera = ["Detected","Not Detected","Not Detected","Not
Detected","Not Detected","Not Detected",]
 camera_reading = random.choice(camera)
 flame = ["Detected","Not Detected","Not Detected","Not
Detected","Not Detected","Not Detected",]
 flame_reading = random.choice(flame)
 moist_level = round(random.uniform(0,100),2)
 water_level = round(random.uniform(0,30),2)

#storing the sensor data to send in json format to cloud.

 temp_data = { 'Temperature' : temp_sensor }
 PH_data = { 'PH Level' : PH_sensor }
 camera_data = { 'Animal attack' : camera_reading}
 flame_data = { 'Flame' : flame_reading }
 moist_data = { 'Moisture Level' : moist_level}
 water_data = { 'Water Level' : water_level}

# publishing Sensor data to IBM Watson for every 5-10 
seconds.
 success = deviceCli.publishEvent("Temperature sensor", 
"json", temp_data, qos=0)
 sleep(1)
 if success:
   print (" ............................publish ok............................. ")
   print ("Published Temperature = %s C" % temp_sensor, "to 
IBM Watson")

 success = deviceCli.publishEvent("PH sensor", "json", 
PH_data, qos=0)
 sleep(1)
 if success:
   print ("Published PH Level = %s" % PH_sensor, "to IBM 
Watson")

 success = deviceCli.publishEvent("camera", "json", 
camera_data, qos=0)
 sleep(1)
 if success:
   print ("Published Animal attack %s " % camera_reading, "to
IBM Watson")
 success = deviceCli.publishEvent("Flame sensor", "json",
flame_data, qos=0)
 sleep(1)
 if success:
   print ("Published Flame %s " % flame_reading, "to IBM
Watson")

 success = deviceCli.publishEvent("Moisture sensor", "json",
moist_data, qos=0)
 sleep(1)
 if success:
   print ("Published Moisture Level = %s " % moist_level, "to
IBM Watson")

 success = deviceCli.publishEvent("Water sensor", "json",
water_data, qos=0)
 sleep(1)
 if success:
   print ("Published Water Level = %s cm" % water_level, "to
IBM Watson")
   print ("")
 #Automation to control sprinklers by present temperature an
to send alert message to IBM Watson.
```

```
 if (temp_sensor > 35):
    print("sprinkler-1 is ON")
 success = deviceCli.publishEvent("Alert1", "json",{ 'alert1' :
"Temperature(%s) is high, sprinkerlers are turned ON"
%temp_sensor }
, qos=0)
 sleep(1)
 if success:
   print( 'Published alert1 : ', "Temperature(%s) is high,
sprinkerlers are turned ON" %temp_sensor,"to IBM Watson")
   print("")
 else:
   print("sprinkler-1 is OFF")
   print("")

 #To send alert message if farmer uses the unsafe fertilizer to
crops.

 if (PH_sensor > 7.5 or PH_sensor < 5.5):
     success = deviceCli.publishEvent("Alert2", "json",{ 'alert2'
: "Fertilizer PH level(%s) is not safe,use other fertilizer"
%PH_sensor } ,
qos=0)
```

```
 sleep(1)
 if success:
    print('Published alert2 : ' , "Fertilizer PH level(%s) is not
safe,use other fertilizer" %PH_sensor,"to IBM Watson")
    print ("")

# To send alert message to farmer that animal attack on crops.

 if (camera_reading == "Detected"):
     success = deviceCli.publishEvent("Alert3", "json", {
'alert3' : "Animal attack on crops detected" }, qos=0)
     sleep(1)
 if success:
      print('Published alert3 : ' , "Animal attack on crops
detected","to IBM Watson","to IBM Watson")
      print("")
 #To send alert message if flame detected on crop land and
turn ON the splinkers to take immediate action.

 if (flame_reading == "Detected"):
    print("sprinkler-2 is ON")
    success = deviceCli.publishEvent("Alert4", "json", { 'alert4'
: "Flame is detected crops are in danger,sprinklers turned ON"
}, qos=0)
```

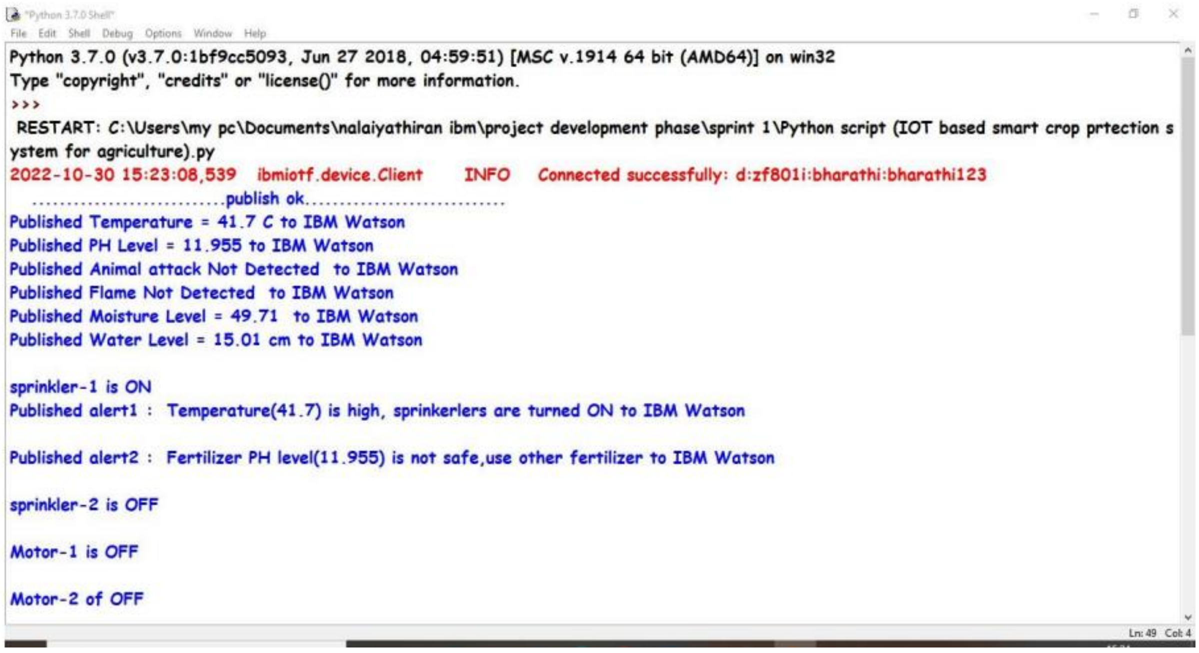
```
    sleep(1)
 if success:
    print( 'Published alert4 : ' , "Flame is detected crops are in
danger,sprinklers turned ON","to IBM Watson")
    print("")
 else:
    print("sprinkler-2 is OFF")
    print("")
 #To send alert message if Moisture level is LOW and to Turn
ON Motor-1 for irrigation.
 if (moist_level < 20):
   print("Motor-1 is ON")
   success = deviceCli.publishEvent("Alert5", "json", { 'alert5'
: "Moisture level(%s) is low, Irrigation started" %moist_level
}, qos=0)
   sleep(1)
if success:
     print('Published alert5 : ' , "Moisture level(%s) is low,
Irrigation started" %moist_level,"to IBM Watson" )
     print("")
else:
       print("Motor-1 is OFF")
       print("")
 #To send alert message if Water level is HIGH and to Turn
ON Motor-2 to take water out.
if (water_level > 20):
    print("Motor-2 is ON")
    success = deviceCli.publishEvent("Alert6", "json", { 'alert6'
: "Water level(%s) is high, so motor is ON to take water out "
%water_level }, qos=0)
    sleep(1)
    if success:
        print('Published alert6 : ' , "water level(%s) is high, so
motor is ON to take water out " %water_level,"to IBM
Watson" )
        print("")
    else:
            print("Motor-2 of OFF")
            print("")
 #command recived by farmer
deviceCli.commandCallback = myCommandCallback
# Disconnect the device and application from the cloud
deviceCli.disconnect()
```



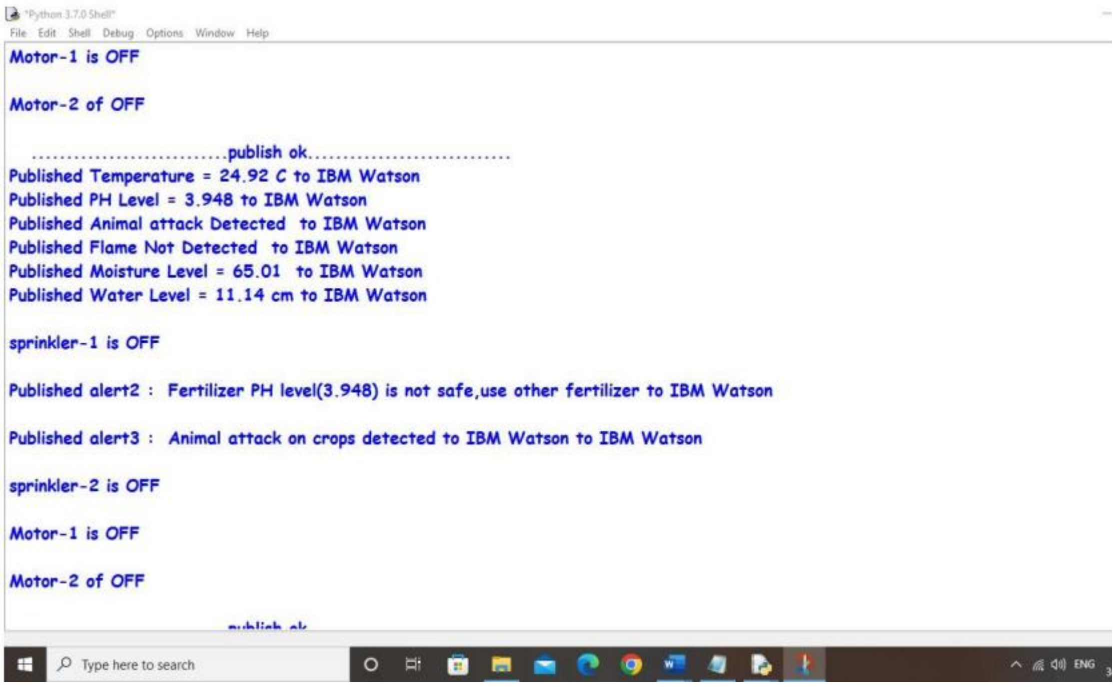
ibm ss.py - C:/Users/Sakthi Sneghaa/Desktop/ibm ss.py (3.11.0)
File Edit Format Run Options Window Help

```
      print('Published alert3 : ' , "Animal attack on crops detected","to IBM Watson","to IBM Watson")
      print("")
 #To send alert message if flame detected on crop land and turn ON the splinkers to take immediate action.

 if (flame_reading == "Detected"):
    print("sprinkler-2 is ON")
    success = deviceCli.publishEvent("Alert4", "json", { 'alert4' : "Flame is detected crops are in danger,sprinklers turned ON" }, qos=0)
    sleep(1)
 if success:
    print( 'Published alert4 : ' , "Flame is detected crops are in danger,sprinklers turned ON","to IBM Watson")
    print("")
 else:
    print("sprinkler-2 is OFF")
    print("")
 #To send alert message if Moisture level is LOW and to Turn ON Motor-1 for irrigation.
 if (moist_level < 20):
   print("Motor-1 is ON")
   success = deviceCli.publishEvent("Alert5", "json", { 'alert5' : "Moisture level(%s) is low, Irrigation started" %moist_level }, qos=0)
   sleep(1)
if success:
     print('Published alert5 : ' , "Moisture level(%s) is low, Irrigation started" %moist_level,"to IBM Watson" )
     print("")
else:
       print("Motor-1 is OFF")
       print("")| #To send alert message if Water level is HIGH and to Turn ON Motor-2 to take water out.
if (water_level > 20):
    print("Motor-2 is ON")
    success = deviceCli.publishEvent("Alert6", "json", { 'alert6' : "Water level(%s) is high, so motor is ON to take water out "
%water_level }, qos=0)
    sleep(1)
    if success:
        print('Published alert6 : ' , "water level(%s) is high, so motor is ON to take water out " %water_level,"to IBM Watson" )
        print("")
    else:
            print("Motor-2 of OFF")
            print("")
 #command recived by farmer
deviceCli.commandCallback = myCommandCallback
# Disconnect the device and application from the cloud
deviceCli.disconnect()
```

OUTPUT



```
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:59:51) [MSC v.1914 64 bit (AMD64)] on win32
Type "copyright", "credits" or "license()" for more information.
>>>
 RESTART: C:\Users\my pc\Documents\nalaiyathiran ibm\project development phase\sprint 1\Python script (IOT based smart crop prtection s
ystem for agriculture).py
2022-10-30 15:23:08,539   ibmiotf.device.Client     INFO    Connected successfully: d:zf801i:bharathi:bharathi123
   ...........................publish ok.............................
Published Temperature = 41.7 C to IBM Watson
Published PH Level = 11.955 to IBM Watson
Published Animal attack Not Detected  to IBM Watson
Published Flame Not Detected  to IBM Watson
Published Moisture Level = 49.71  to IBM Watson
Published Water Level = 15.01 cm to IBM Watson

sprinkler-1 is ON
Published alert1 :  Temperature(41.7) is high, sprinkerlers are turned ON to IBM Watson

Published alert2 :  Fertilizer PH level(11.955) is not safe,use other fertilizer to IBM Watson

sprinkler-2 is OFF

Motor-1 is OFF

Motor-2 of OFF
```



```
Motor-1 is OFF

Motor-2 of OFF

   ............................publish ok.............................
Published Temperature = 24.92 C to IBM Watson
Published PH Level = 3.948 to IBM Watson
Published Animal attack Detected  to IBM Watson
Published Flame Not Detected  to IBM Watson
Published Moisture Level = 65.01  to IBM Watson
Published Water Level = 11.14 cm to IBM Watson

sprinkler-1 is OFF

Published alert2 :  Fertilizer PH level(3.948) is not safe,use other fertilizer to IBM Watson

Published alert3 :  Animal attack on crops detected to IBM Watson to IBM Watson

sprinkler-2 is OFF

Motor-1 is OFF

Motor-2 of OFF
```