SPRINT-2

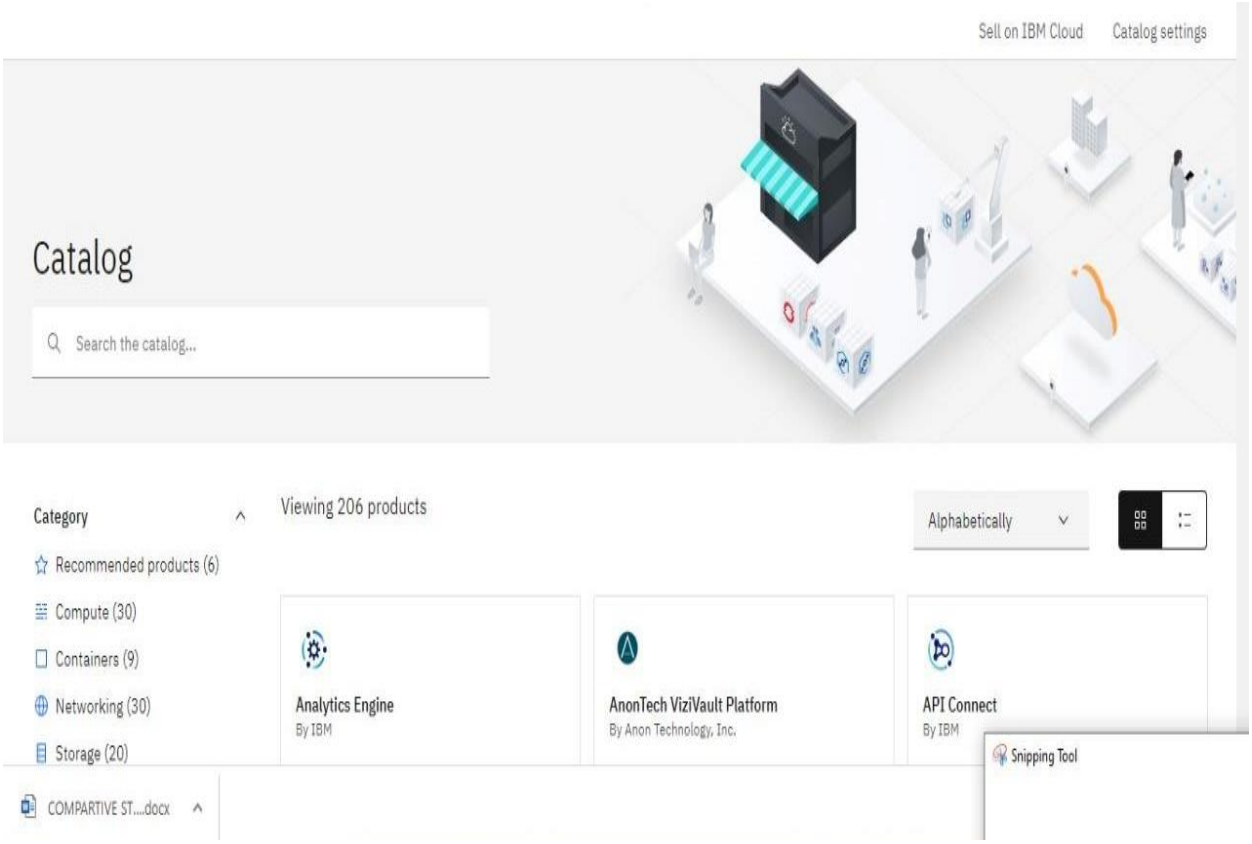
TEAM ID: PNT2022TMID11102

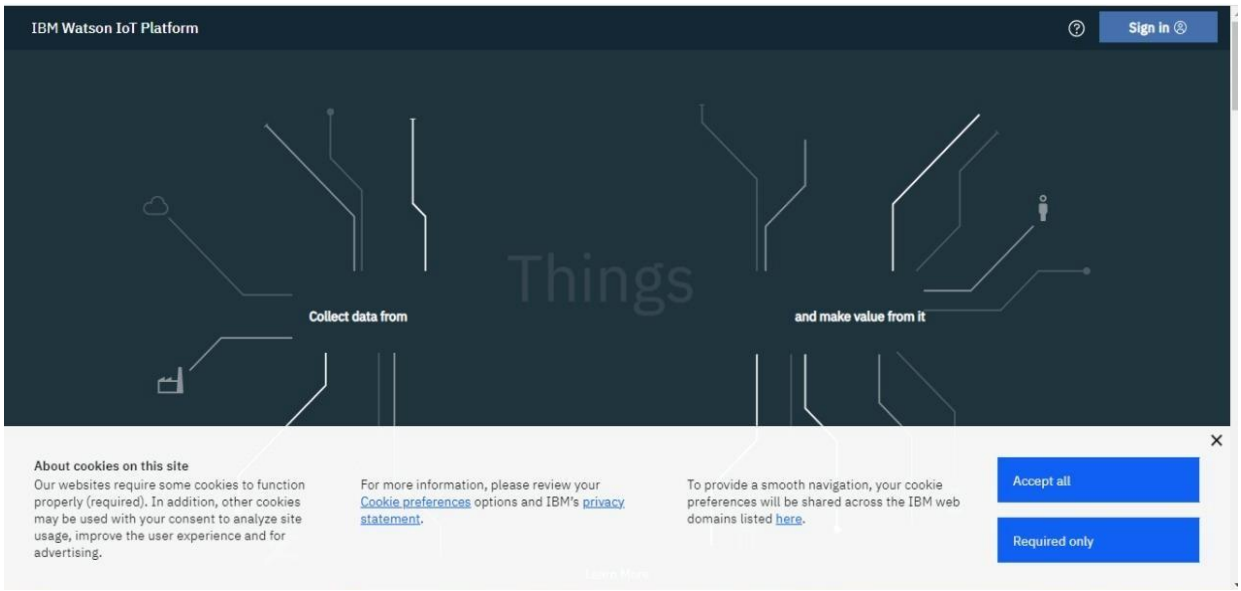
PROJECT NAME : IOT based smart crop protection systemfor Agriculture

STEPS:

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

CREATION OF IBM WATSON CLOUD PLATFROM:

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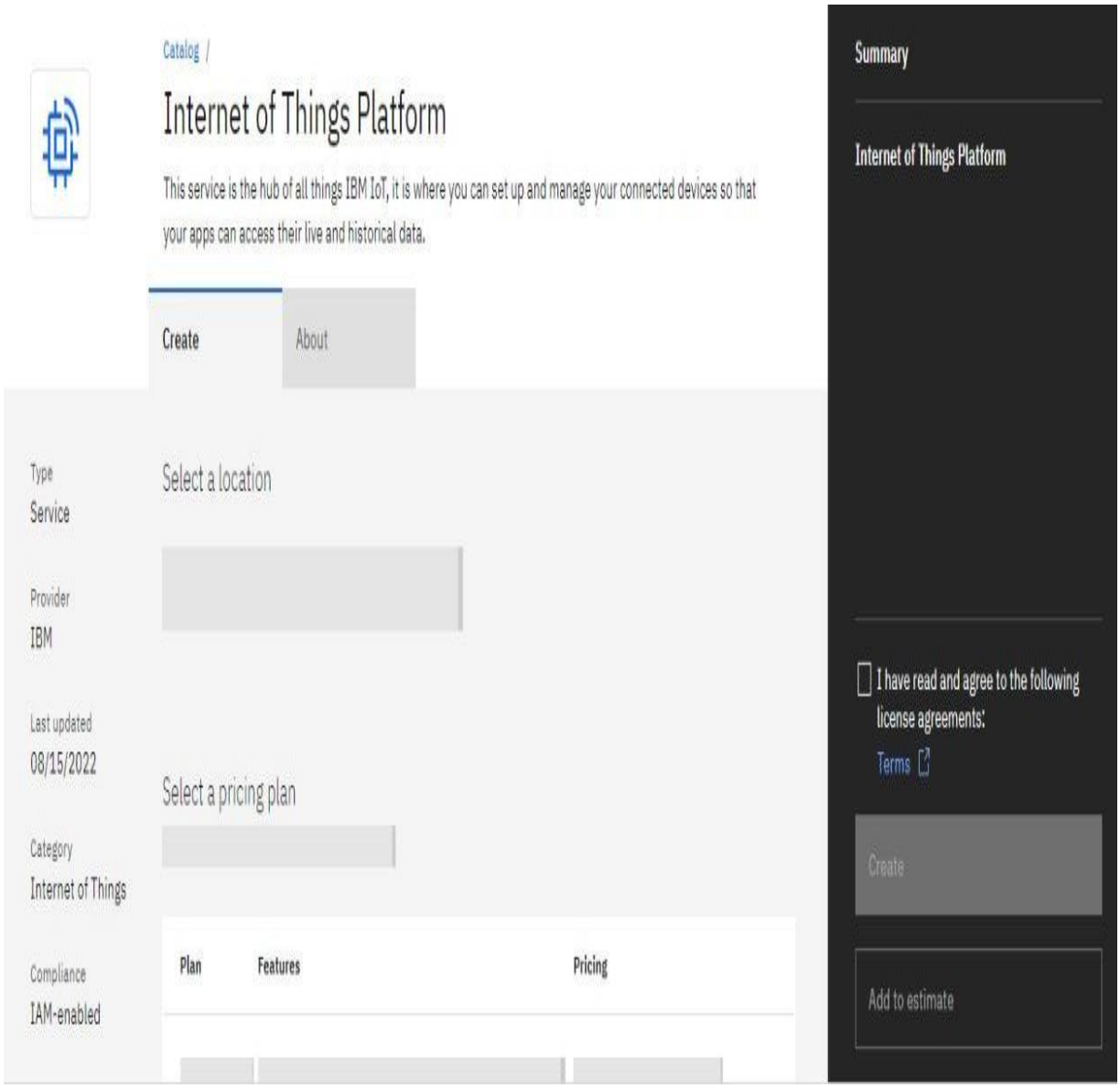
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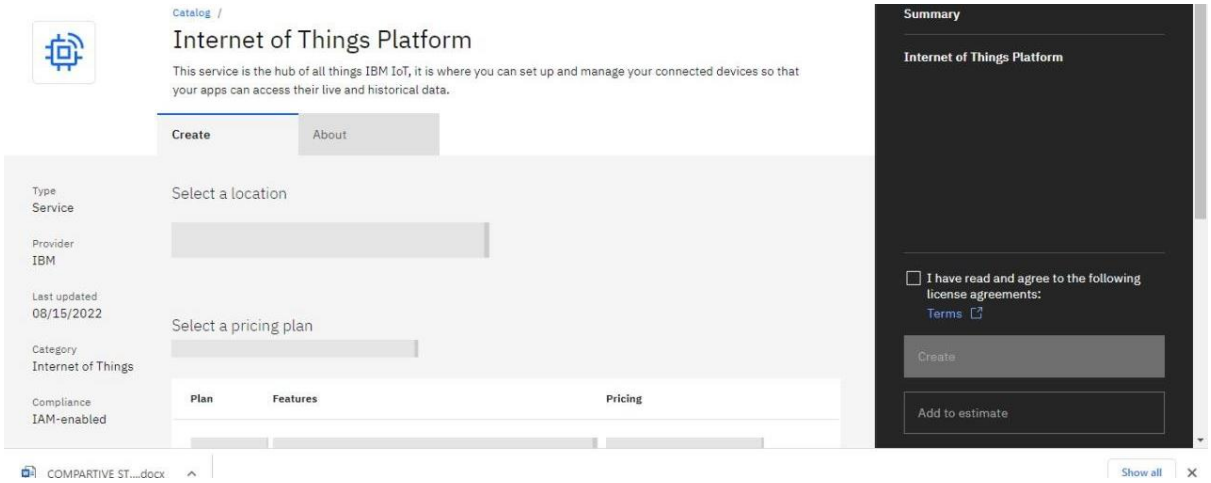

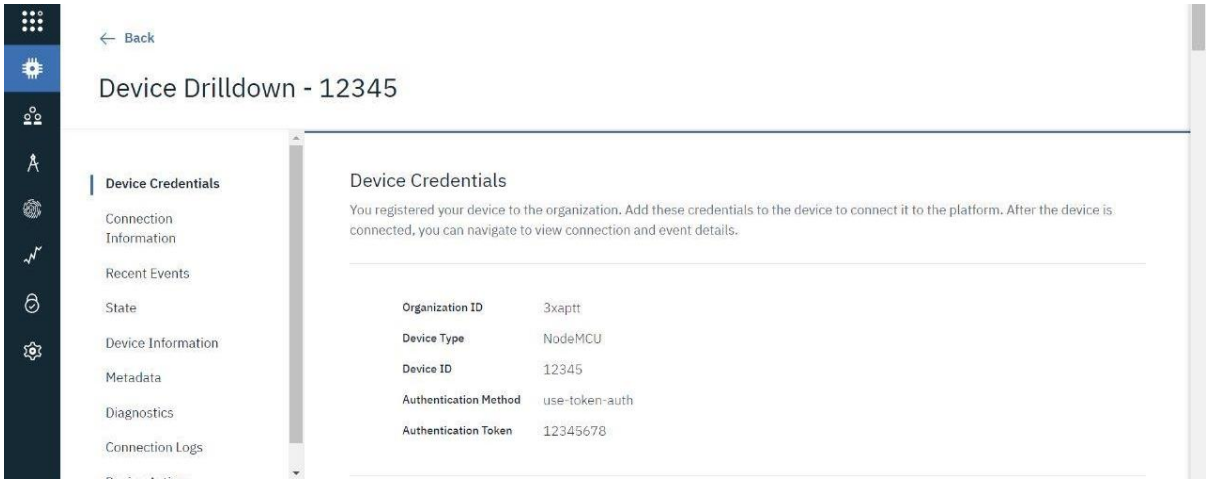

CODE:

```
import random
import ibmiotf.application
import ibmiotf.device
from time import sleep
import sys
organization = "gjx22e"
deviceType = "smartcrop"
deviceId = "53302945"
authMethod = "use-token-auth"
authToken = "987654321"
def myCommandCallback(cmd):
 print("%s" % cmd.data['command'])
```

```
status=cmd.data['command']
 if status=="sprinkler_on":
 print ("sprinkler is turning ON")
 else :
 print ("sprinkler is turning OFF")

try:
 deviceOptions = {"org": organization, "type": deviceType, "id": deviceId, "auth-
method": authMethod, "authtoken": authToken}
 deviceCli = ibmiotf.device.Client(deviceOptions)
except Exception as e:
 print("Exception detected in connecting device: %s" % str(e))
 sys.exit()
deviceCli.connect()
while True:
 temp = round( random.uniform(0,80),2)
 PH = round(random.uniform(1,14),3)
moisture= round(random.uniform(0,100),2)
 water_level = round(random.uniform(0,30),2)
 temp_data = { 'Temp' : temp }
 PH_data = { 'PH value' : Ph }
 moist_data = { 'Moisture level' : moist_level}
 water_data = { 'Water level' : water_level}
 success = deviceCli.publishEvent("Temperature sensor", "json", temp_data,
qos=0)
 sleep(1)
 if success:
 print ("... ...publish ok... ... ...")
 print ("Published Temp = %s C" % temp, "to IBM Watson")
 success = deviceCli.publishEvent("PH sensor", "json", PH_data, qos=0)
 sleep(1)
 if success:
```

```
 print ("Published PH value = %s" % Ph, "to IBM Watson")
 success = deviceCli.publishEvent("camera", "json", camera_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 ("")
 if (temp > 35):
 print("sprinkler-1 is ON")
 success = deviceCli.publishEvent("Alert1", "json",{ 'alert1' : "Temperature(%s)
is high, sprinkerlers are turned
ON" %temp }, qos=0)
 sleep(1)
 if success:
 print( 'Published Alert1 : ', "Temperature(%s) is high, sprinkerlers are turned
ON" %temp,"to IBM Watson")
 print("")
 else:
 print("sprinkler-1 is OFF")
 print("")
 if (Ph > 7.5 or Ph < 5.5):
 success = deviceCli.publishEvent("Alert2", "json",{ 'alert2' : "Fertilizer PH
level(%s) is not safe,use other
fertilizer" %Ph } , qos=0)
 sleep(1)
 if success:
 print('Published Alert2 : ' , "Fertilizer PH level(%s) is not safe,use other
fertilizer" %Ph,"to IBM Watson")
 print("")
```

deviceCli.commandCallback = myCommandCallbackdeviceCli.disconnect()

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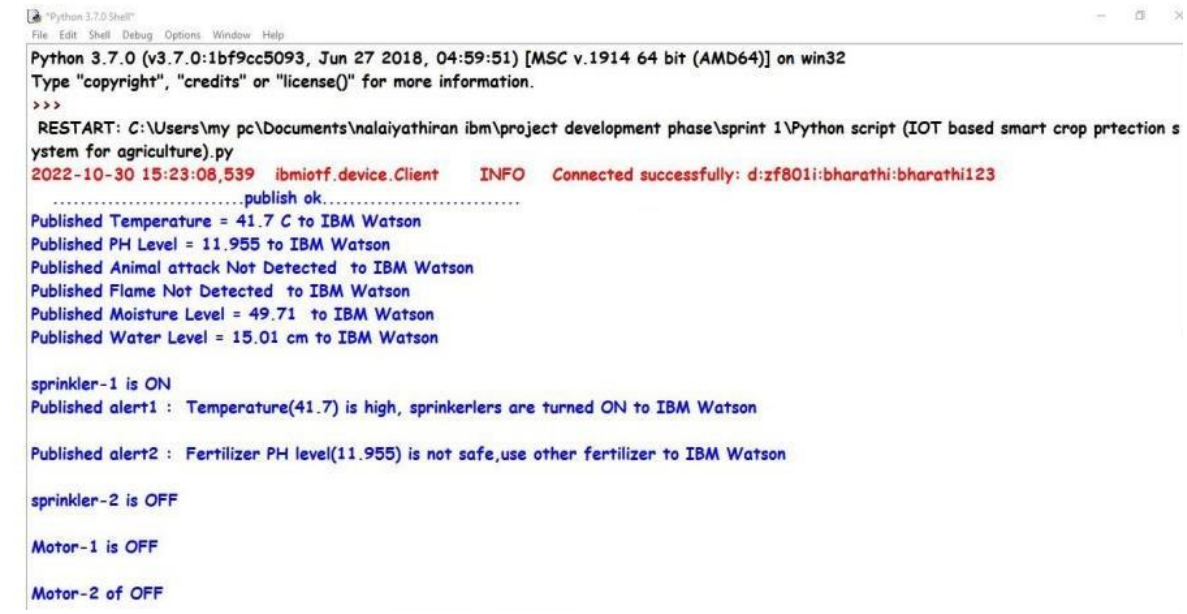
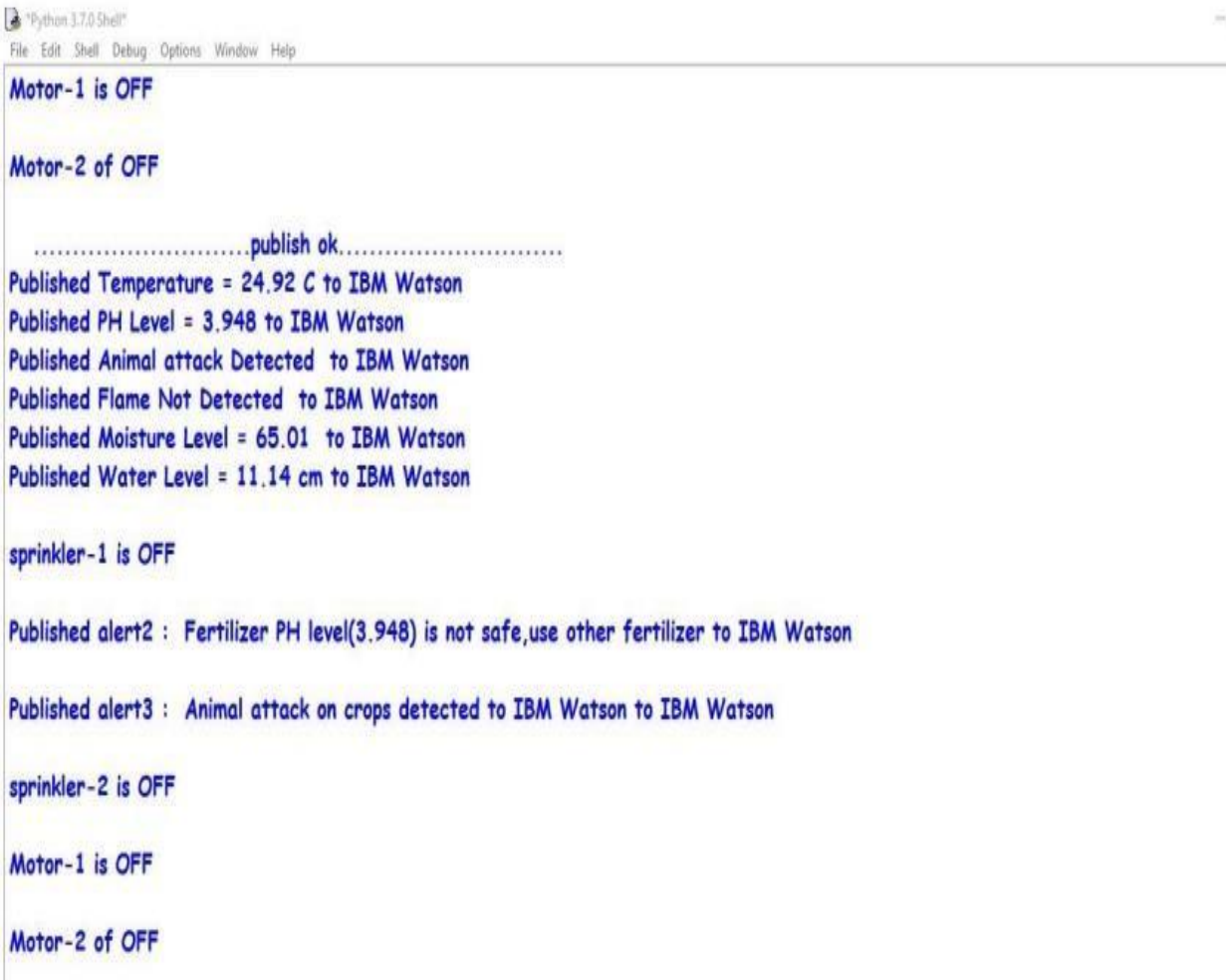
```
     print('Published alert3 : ' , "Animal attack on crops detected","to IBM Watson","to IBM Watson")
     print("")
#To send alert message if flame detected on crop land and turn ON the splinkers to take immediate action.

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 Shell"
File Edit Shell Debug Options Window Help
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 system 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


"Python 3.7.0 Shell"
File Edit Shell Debug Options Window Help
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