Sprint-1

Python Script

Date	10 November 2022
Team ID	PNT2022TMID47379
Project Name	IOT BASED CROP PROTECTION SYSTEM FOR AGRICULTURE

Description:

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.

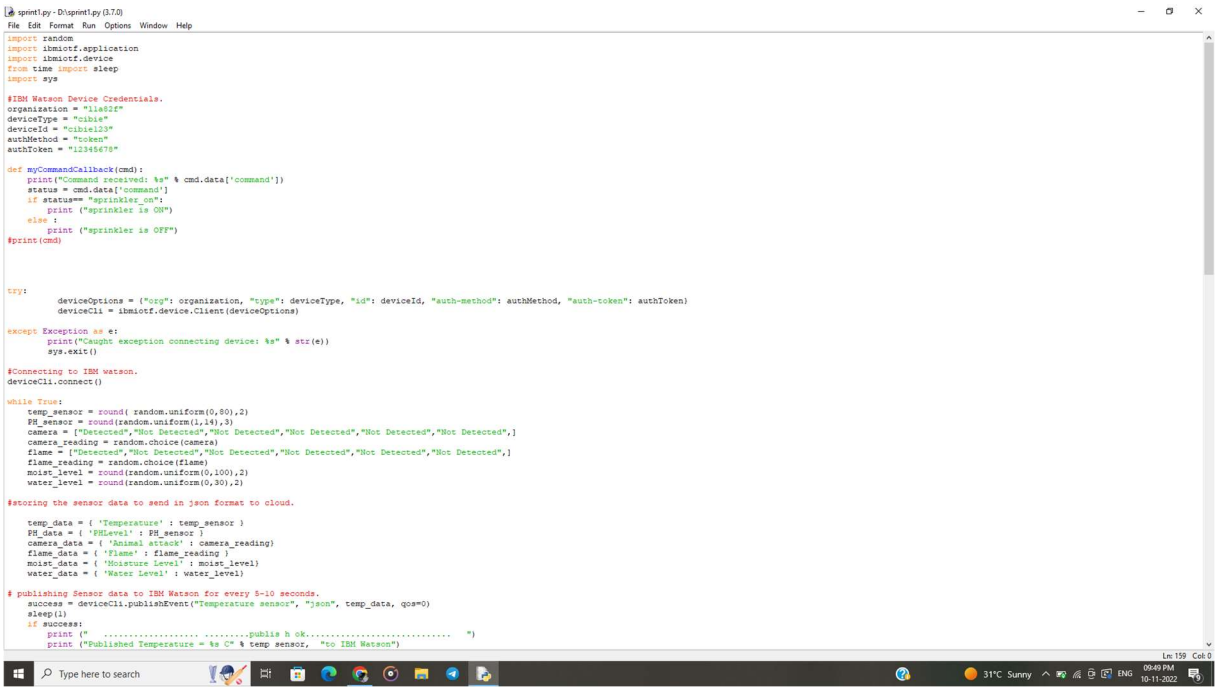
Python Code:

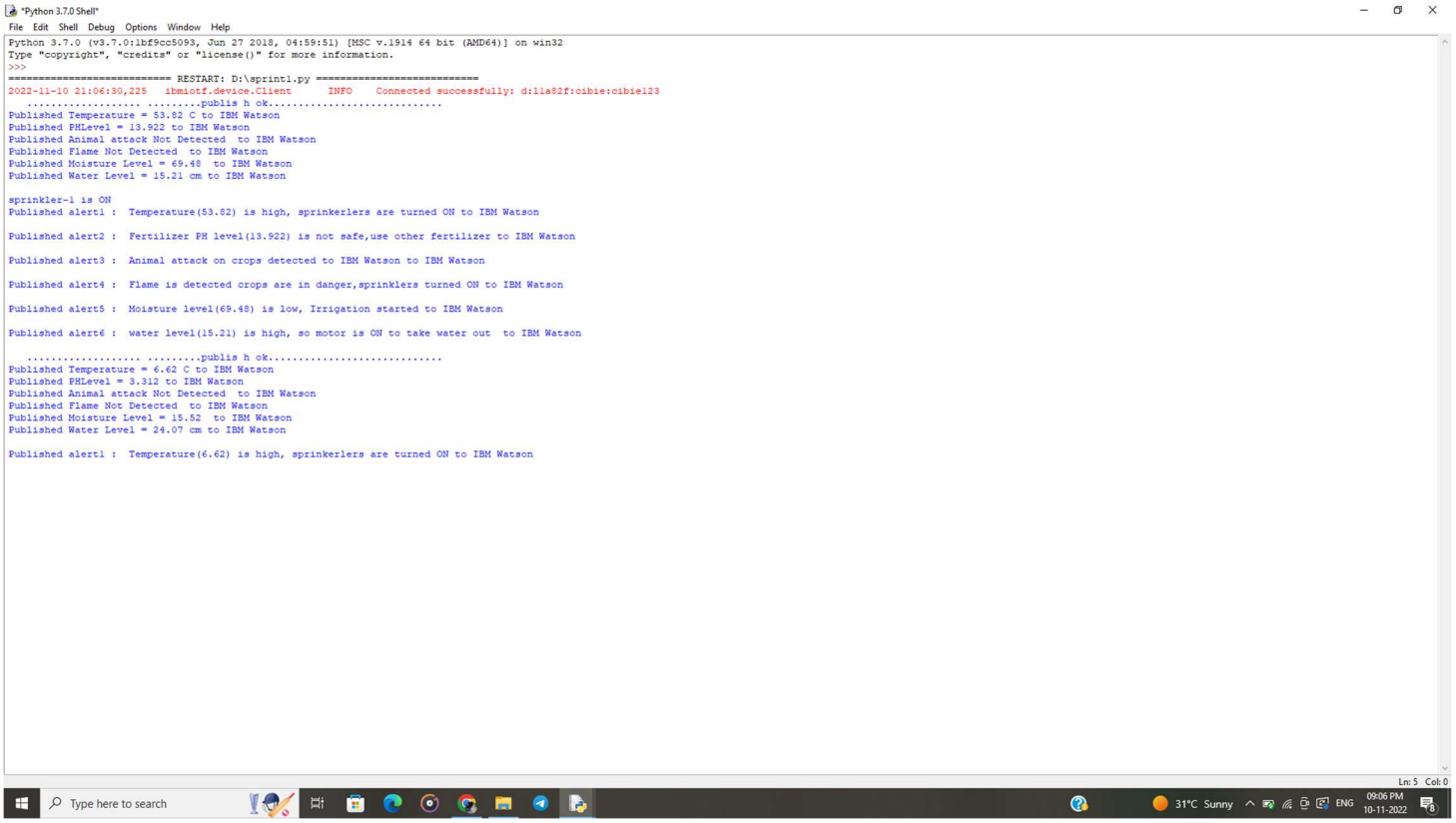
```
import random
import ibmiotf.application
import ibmiotf.device
from time import sleep
import sys

#IBM Watson Device Credentials.
organization = "l1a82f"
deviceType = "cibie"
deviceId = "cibie123"
authMethod = "token"
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()
```

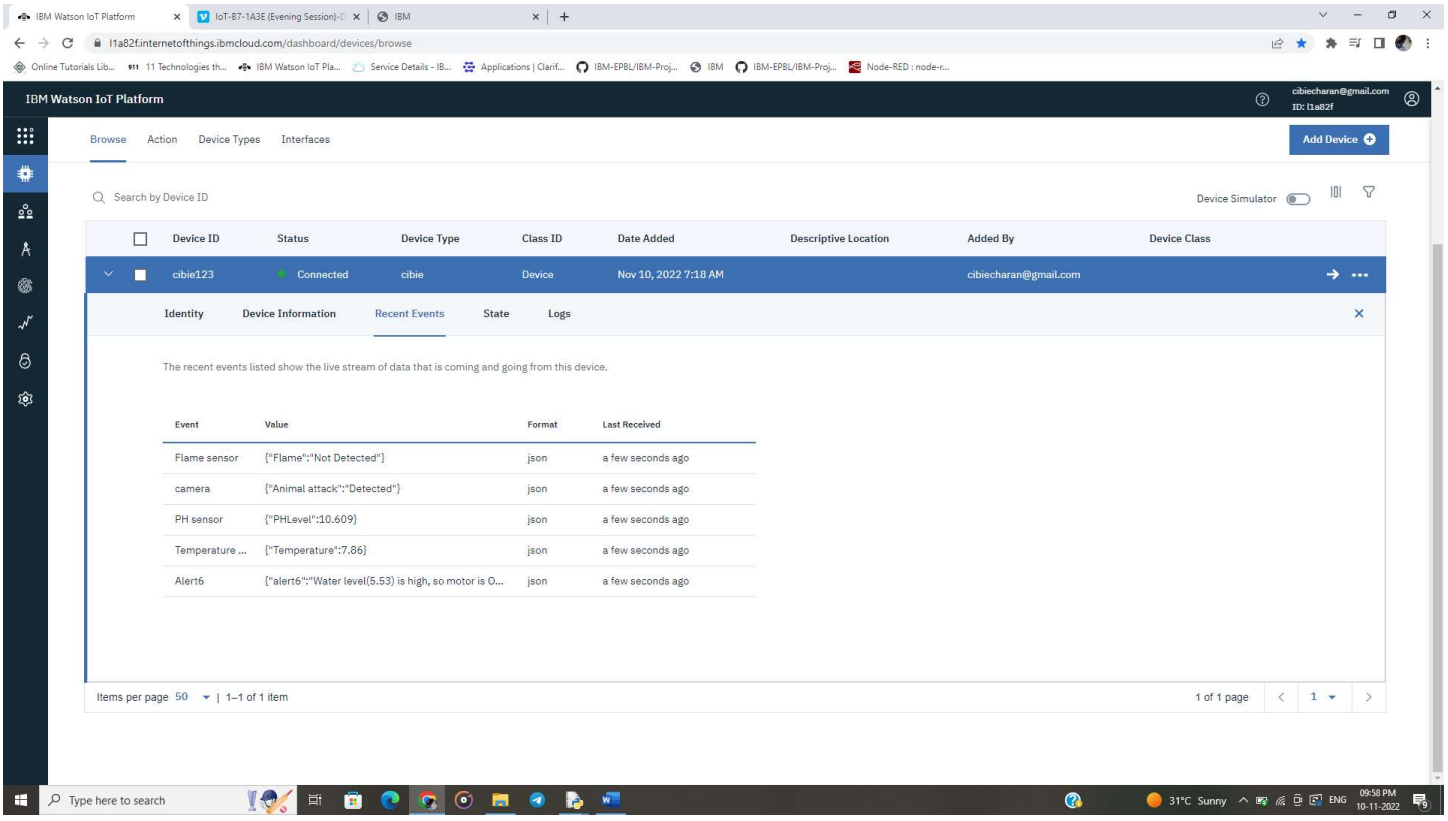
```
while True:
   temp_sensor = round( random.uniform(0,80),2)
   PH_sensor = round(random.uniform(1,14),3)
   camera = ["Detected","Not Detected","Not Detected","Not Detected","Not Detected","Not Detected",]
   camera_reading = random.choice(camera)
   flame = ["Detected","Not Detected","Not Detected","Not 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 = { 'PHLevel' : 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 ("   ..... .....publis h 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 PHLevel = %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("")

    deviceCli.commandCallback = myCommandCallback
# Disconnect the device and application from the cloud
deviceCli.disconnect()
```




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: D:\sprint1.py ==========
2022-11-10 21:06:30,225 ibmiotf.device.Client INFO Connected successfully: d:l1a82f:cibie:cibie123
... .publis h ok.....
Published Temperature = 53.82 C to IBM Watson
Published PHLevel = 13.922 to IBM Watson
Published Animal attack Not Detected to IBM Watson
Published Flame Not Detected to IBM Watson
Published Moisture Level = 69.48 to IBM Watson
Published Water Level = 15.21 cm to IBM Watson
sprinkler-1 is ON
Published alert1 : Temperature(53.82) is high, sprinkerlers are turned ON to IBM Watson
Published alert2 : Fertilizer PH level(13.922) is not safe,use other fertilizer to IBM Watson
Published alert3 : Animal attack on crops detected to IBM Watson to IBM Watson
Published alert4 : Flame is detected crops are in danger,sprinklers turned ON to IBM Watson
Published alert5 : Moisture level(69.48) is low, Irrigation started to IBM Watson
Published alert6 : water level(15.21) is high, so motor is ON to take water out to IBM Watson
... .publis h ok.....
Published Temperature = 6.62 C to IBM Watson
Published PHLevel = 3.312 to IBM Watson
Published Animal attack Not Detected to IBM Watson
Published Flame Not Detected to IBM Watson
Published Moisture Level = 15.52 to IBM Watson
Published Water Level = 24.07 cm to IBM Watson
Published alert1 : Temperature(6.62) is high, sprinkerlers are turned ON to IBM Watson
Ln: 5 Col: 0
Type here to search
31°C Sunny
ENG
09:06 PM
10-11-2022


IBM Watson IoT Platform
IoT-B7-1A3E (Evening Session)
IBM
l1a82f.internetofthings.ibmcloud.com/dashboard/devices/browse
IBM Watson IoT Platform
cibiecharan@gmail.com
ID: l1a82f
Browse
Action
Device Types
Interfaces
Add Device
Search by Device ID
Device Simulator
Device ID
Status
Device Type
Class ID
Date Added
Descriptive Location
Added By
Device Class
cibie123
Connected
cibie
Device
Nov 10, 2022 7:18 AM
cibiecharan@gmail.com
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
Flame sensor
{"Flame":"Not Detected"}
json
a few seconds ago
camera
{"Animal attack":"Detected"}
json
a few seconds ago
PH sensor
{"PHLevel":10.609}
json
a few seconds ago
Temperature ...
{"Temperature":7.86}
json
a few seconds ago
Alert6
{"alert6":"Water level(5.53) is high, so motor is O...
json
a few seconds ago
Items per page 50 | 1–1 of 1 item
1 of 1 page
1
Type here to search
31°C Sunny
ENG
09:58 PM
10-11-2022