Python Script

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

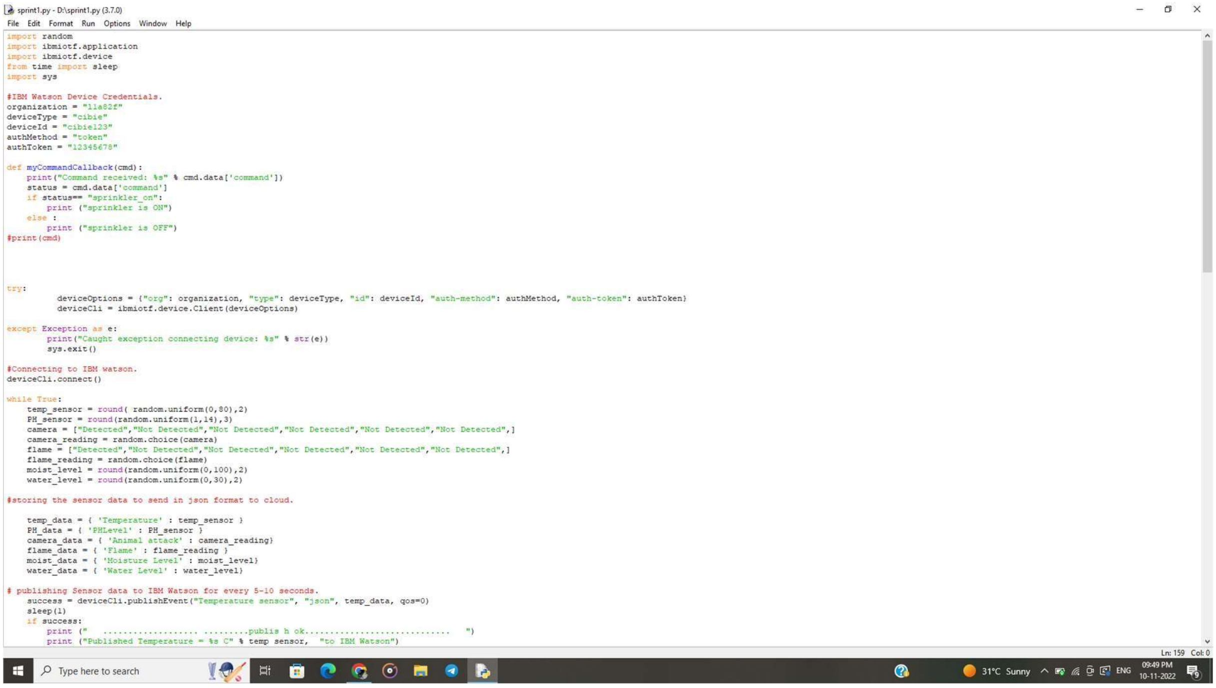
Description:

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.

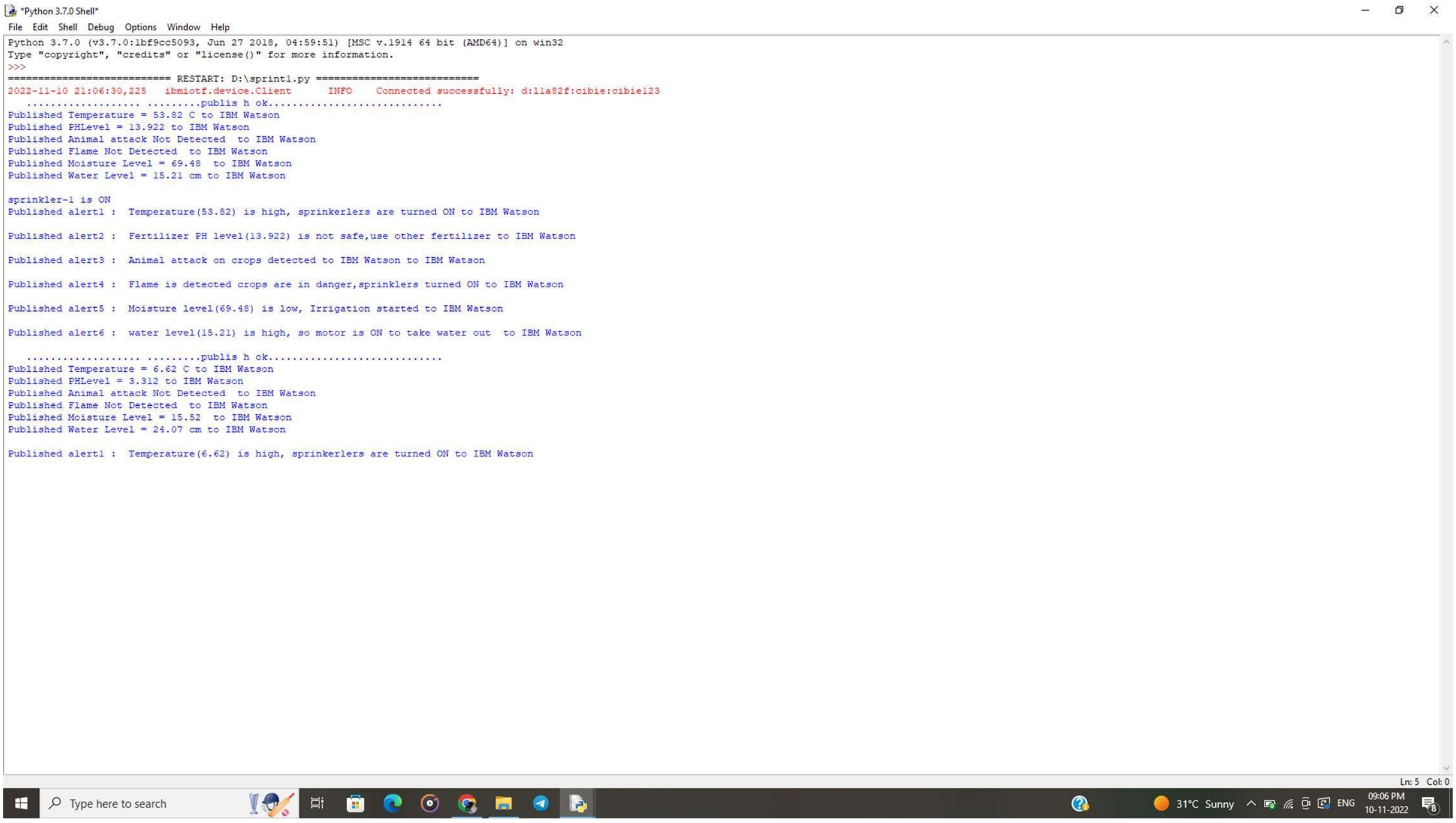
Python Code:

```
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()
```


sprint1.py - D:\sprint1.py (3.7.0)
File Edit Format Run Options Window Help
Ln: 159 Col: 0
Type here to search
31°C Sunny
ENG
09:49 PM
10-11-2022

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

#IBM Watson Device Credentials.
organization = "11a82f"
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")
```



```
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:11a82f: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
```