

```

import random
from time import sleep
import sys
#IBM Watson Device Credentials.
organization = "op701j"
deviceType = "Lokesh"
deviceId = "Lokesh89"
authMethod = "token"
authToken = "1223334444"
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, sprinklerlers are turned ON" %temp_sensor }
, qos=0)
    sleep(1)
    if success:
        print( 'Published alert1 : ', "Temperature(%s) is high, sprinklerlers 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")

#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("")
        #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("")
                #command recived by farmer
                deviceCli.commandCallback = myCommandCallback
                # Disconnect the device and application from the cloud
                deviceCli.disconnect()

```