PROJECT DEVELOPMENT PHASE

SPRINT 1

TEAM ID	PNT2022TMID14113
TITLE	IOT BASED SMART CROP PROTECTION FOR AGRICULTURE

Develop the python code for connecting Watson device's

```
import random
import ibmiotf.application
import ibmiotf.device
from time import sleep
import sys
#IBM Watson Device Credentials.
organization = "op701j"
deviceType = "1234"
deviceId = "12345678"
authMethod = "token"
authToken = "I4&t_V+SNywRBM+voT"
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")
```

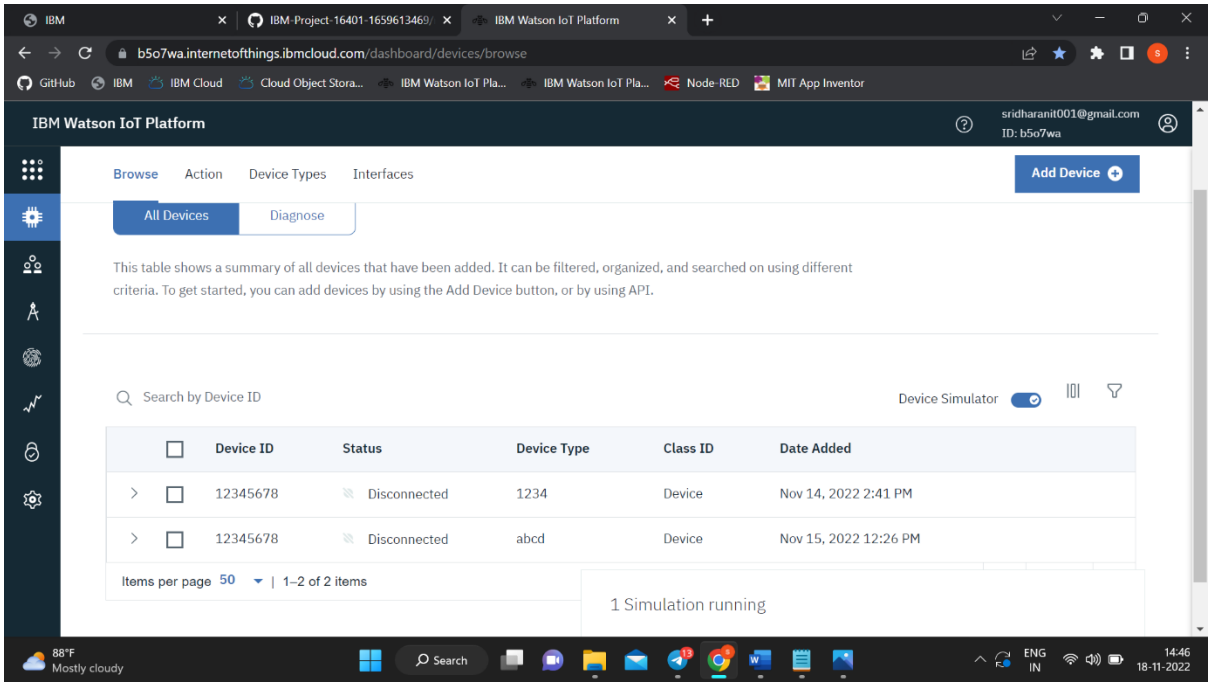
```
 #print(cmd)
try:
 deviceOptions = {"org": organization, "type": deviceType, "id": deviceId, "auth-method": authMethod, "auth-token": authToken}
 deviceCli = ibmiotf.device.Client(deviceOptions)
except Exception as e:
    print("Caught exception connecting device: %s" % str(e))
sys.exit()
#Connecting 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)
```

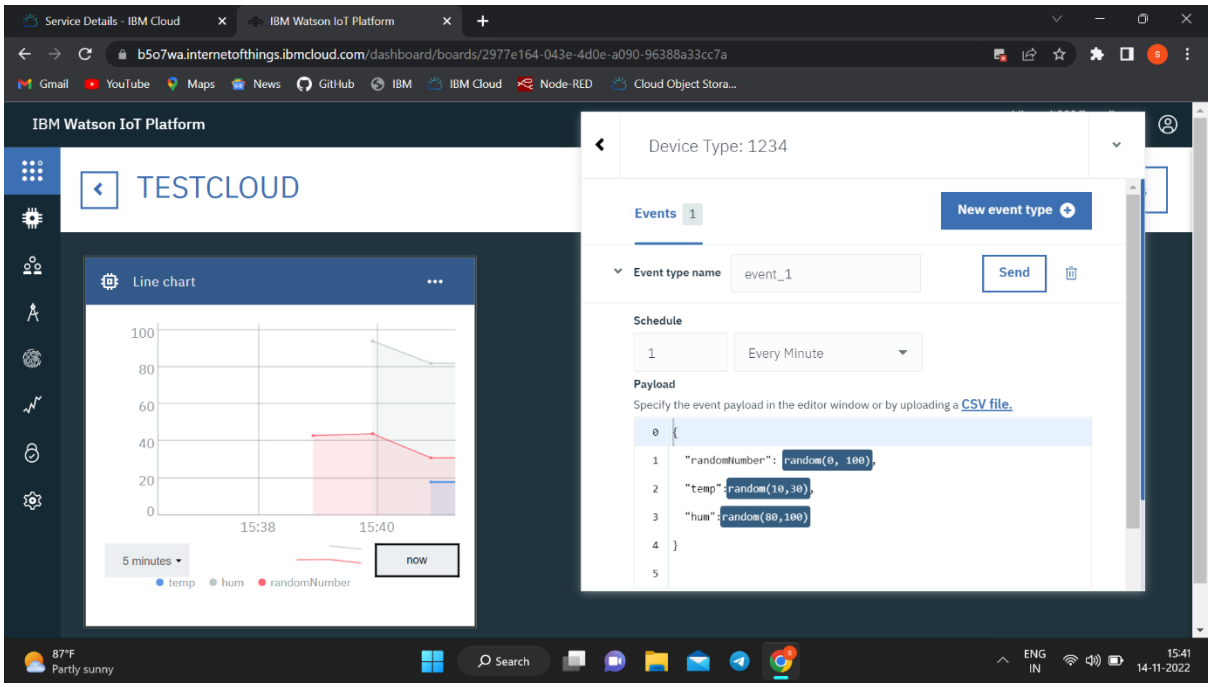
```
 if success:
   print (" .....publish ok..... ")
 print ("Published Temperature = %s C" % temp_sensor, "to IBM Watson")
 success = deviceCli.publishEvent("PH sensor", "json", PH_data, qos=0)
 sleep(1)
 if success:
   print ("Published PH Level = %s" % PH_sensor, "to IBM Watson")
 success = deviceCli.publishEvent("camera",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

 #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()
```

OUTPUT


IBM Watson IoT Platform
b5o7wa.internetofthings.ibmcloud.com/dashboard/devices/browse
sridharanit001@gmail.com
ID: b5o7wa
Browse
Action
Device Types
Interfaces
Add Device
All Devices
Diagnose
This table shows a summary of all devices that have been added. It can be filtered, organized, and searched on using different criteria. To get started, you can add devices by using the Add Device button, or by using API.
Search by Device ID
Device Simulator
Device ID
Status
Device Type
Class ID
Date Added
12345678
Disconnected
1234
Device
Nov 14, 2022 2:41 PM
12345678
Disconnected
abcd
Device
Nov 15, 2022 12:26 PM
Items per page 50
1–2 of 2 items
1 Simulation running


IBM Watson IoT Platform
TESTCLOUD
Line chart
100
80
60
40
20
0
15:38
15:40
5 minutes
now
temp
hum
randomNumber
Device Type: 1234
Events 1
New event type
Event type name
event_1
Send
Schedule
1
Every Minute
Payload
Specify the event payload in the editor window or by uploading a CSV file.
{
"randomNumber": random(0, 100),
"temp":random(10,30),
"hum":random(80,100)
}