Sprint-3

TEAM ID	**PNT2022TMID44577**
PROJECT NAME	**Project-IoT Based Smart Crop Protection System For Agriculture**
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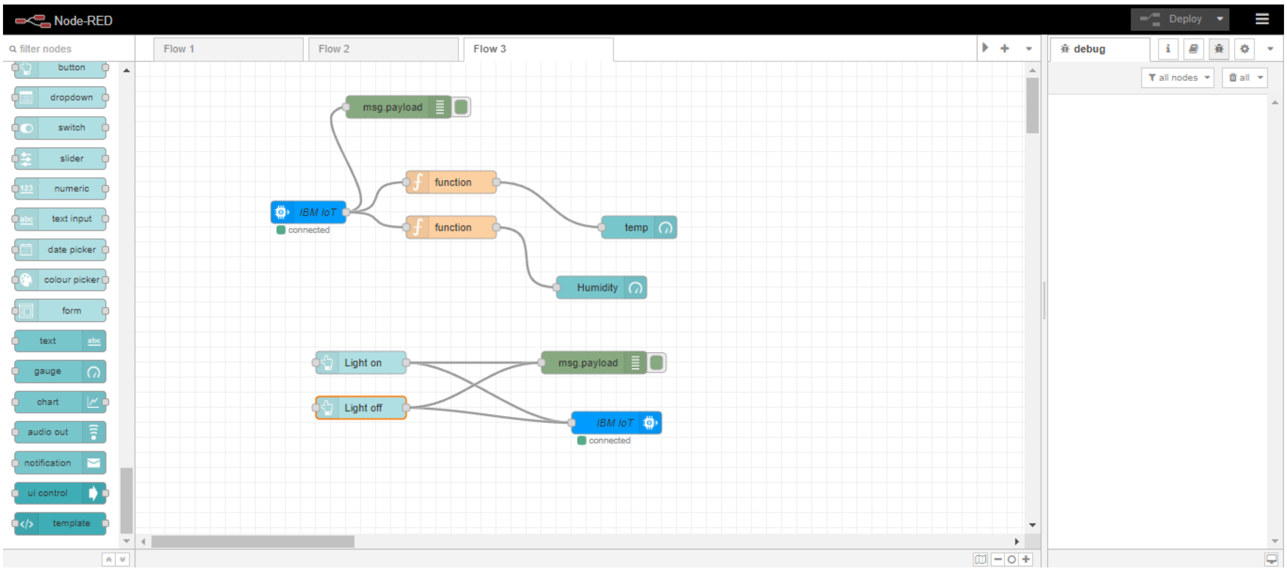
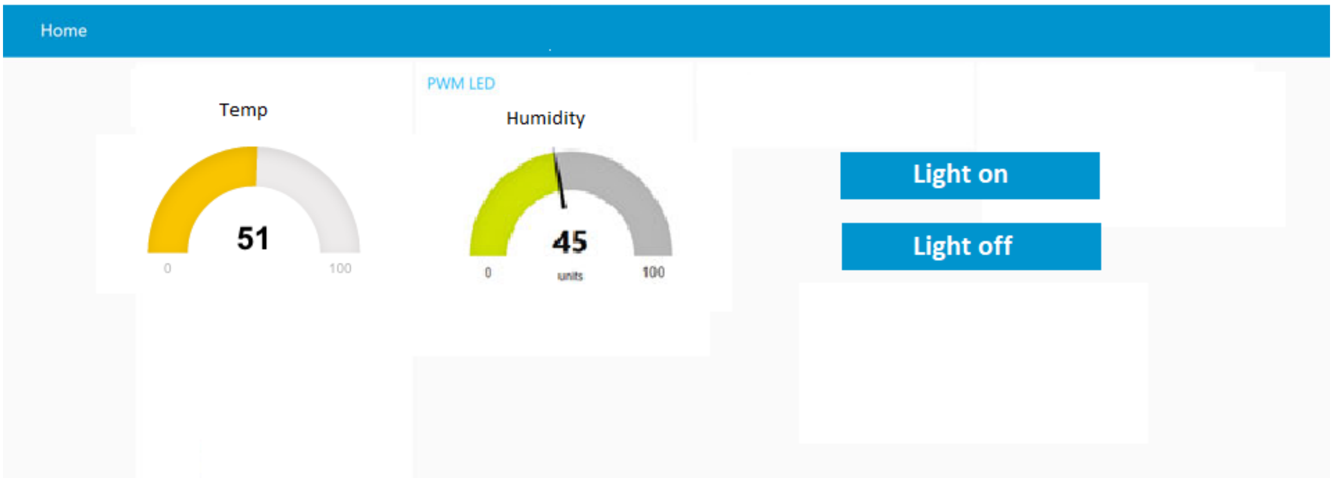
In this activity you are expected to develop & submit the developed code by testing it

NODE RED CIRCUIT:





CODE:

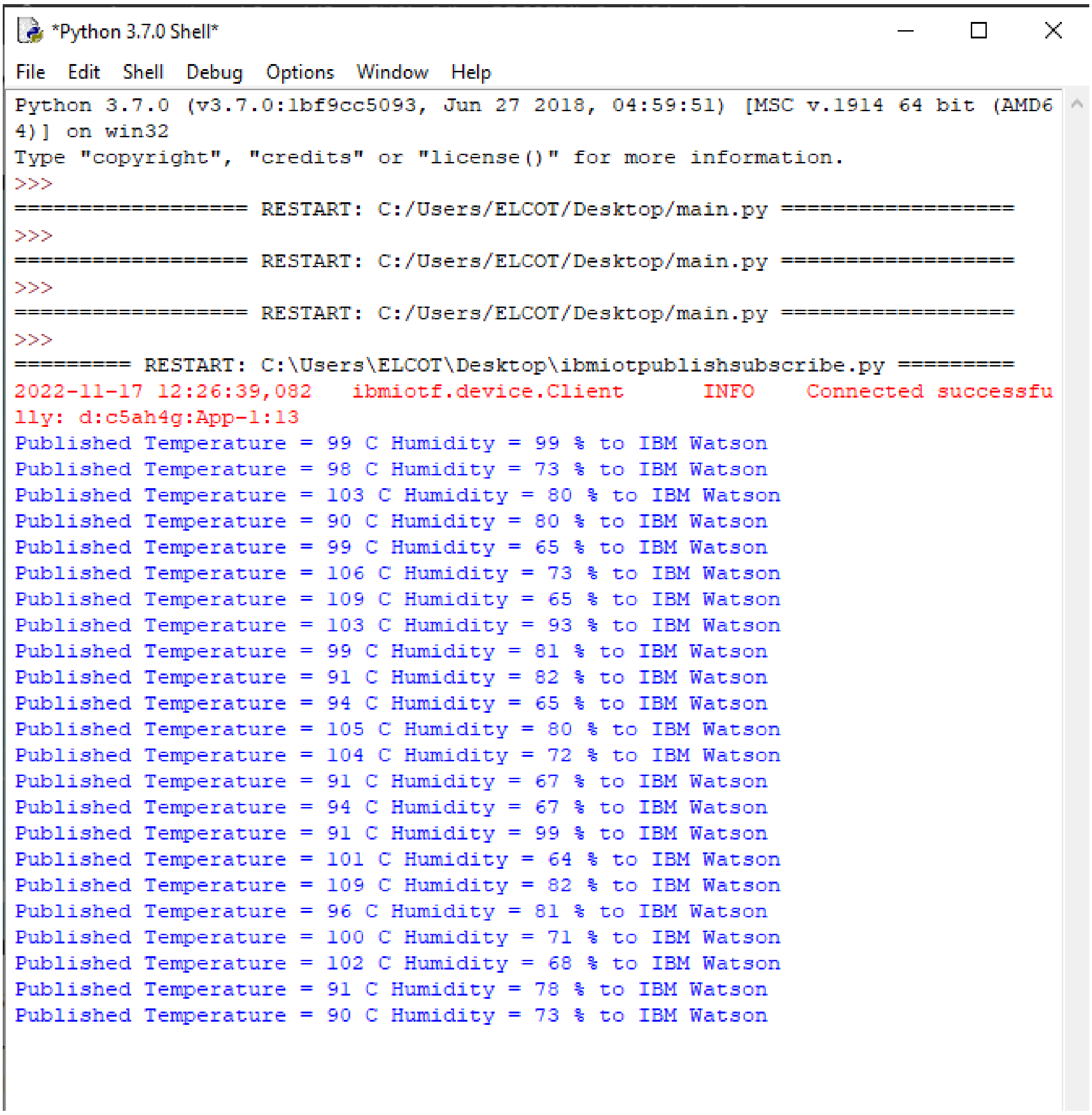
```
import random
import ibmiotf.application
import ibmiotf.device
from time import sleep
import sys
#IBM Watson Device Credentials.
organization = "c5ah4g"
deviceType = "App-1"
deviceId = "13"
authMethod = "token"
authToken = "12345678"
def myCommandCallback(cmd):
 print("Command received: %s" % cmd.data['command'])
 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:

#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:



```
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:59:51) [MSC v.1914 64 bit (AMD6
4)] on win32
Type "copyright", "credits" or "license()" for more information.
>>> 
================== RESTART: C:/Users/ELCOT/Desktop/main.py ==================
>>> 
================== RESTART: C:/Users/ELCOT/Desktop/main.py ==================
>>> 
================== RESTART: C:/Users/ELCOT/Desktop/main.py ==================
>>> 
========= RESTART: C:\Users\ELCOT\Desktop\ibmiotpublishsubscribe.py =========
2022-11-17 12:26:39,082   ibmiotf.device.Client      INFO    Connected successfu
lly: d:c5ah4g:App-1:13
Published Temperature = 99 C Humidity = 99 % to IBM Watson
Published Temperature = 98 C Humidity = 73 % to IBM Watson
Published Temperature = 103 C Humidity = 80 % to IBM Watson
Published Temperature = 90 C Humidity = 80 % to IBM Watson
Published Temperature = 99 C Humidity = 65 % to IBM Watson
Published Temperature = 106 C Humidity = 73 % to IBM Watson
Published Temperature = 109 C Humidity = 65 % to IBM Watson
Published Temperature = 103 C Humidity = 93 % to IBM Watson
Published Temperature = 99 C Humidity = 81 % to IBM Watson
Published Temperature = 91 C Humidity = 82 % to IBM Watson
Published Temperature = 94 C Humidity = 65 % to IBM Watson
Published Temperature = 105 C Humidity = 80 % to IBM Watson
Published Temperature = 104 C Humidity = 72 % to IBM Watson
Published Temperature = 91 C Humidity = 67 % to IBM Watson
Published Temperature = 94 C Humidity = 67 % to IBM Watson
Published Temperature = 91 C Humidity = 99 % to IBM Watson
Published Temperature = 101 C Humidity = 64 % to IBM Watson
Published Temperature = 109 C Humidity = 82 % to IBM Watson
Published Temperature = 96 C Humidity = 81 % to IBM Watson
Published Temperature = 100 C Humidity = 71 % to IBM Watson
Published Temperature = 102 C Humidity = 68 % to IBM Watson
Published Temperature = 91 C Humidity = 78 % to IBM Watson
Published Temperature = 90 C Humidity = 73 % to IBM Watson
```