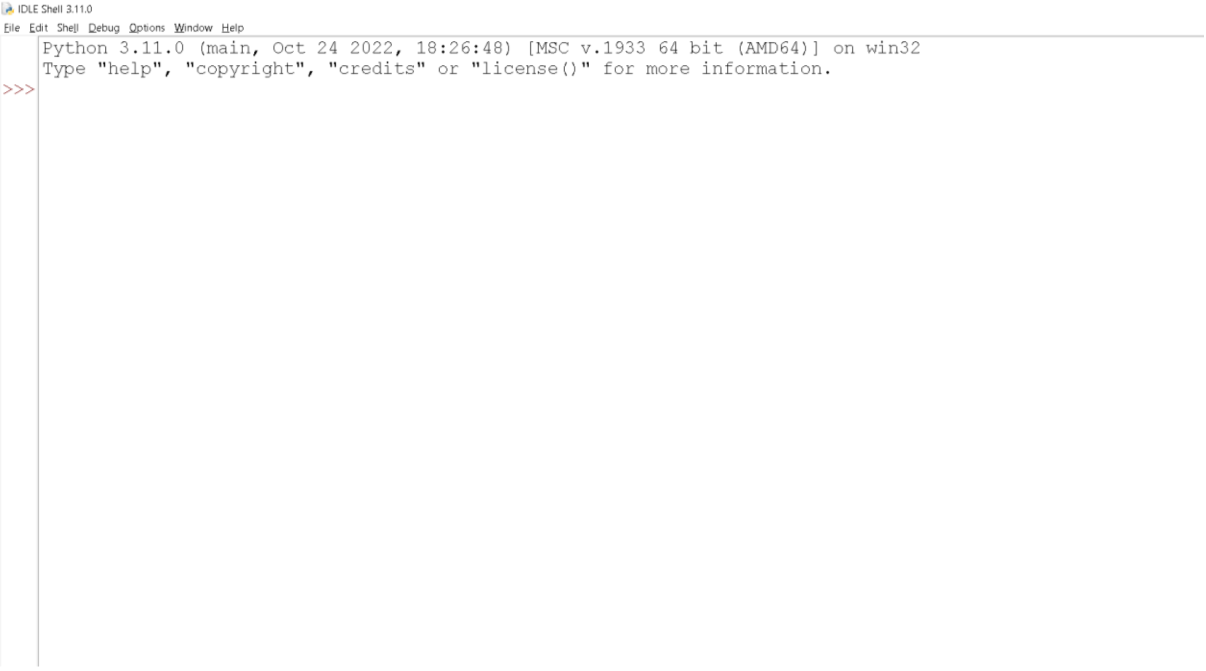
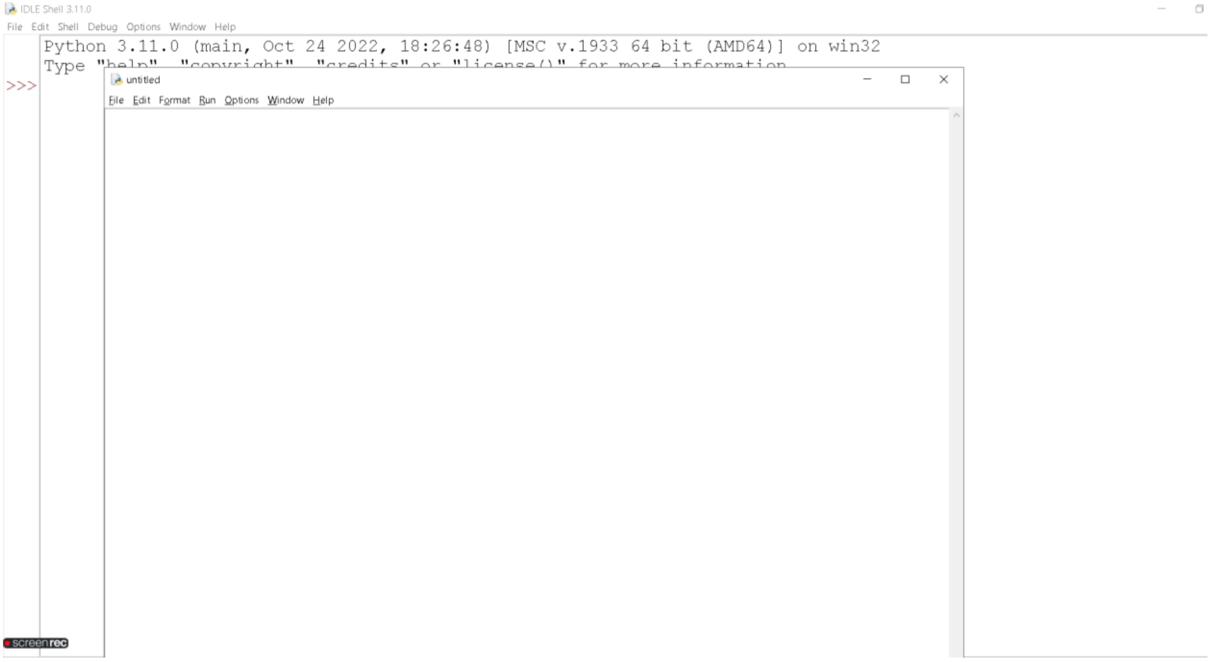
DEVELOP THE PYTHON SCRIPT

DATE	18 NOVEMBER 2022
TEAM ID	PNT2022TMID07330
PROJECT NAME	IOT BASED SMART CROP PROTECTION SYSTEM IN AGRICULTURE



```
Python 3.11.0 (main, Oct 24 2022, 18:26:48) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
```


IDLE Shell 3.11.0
File Edit Shell Debug Options Window Help
untitled
File Edit Format Run Options Window Help
screenrec

```
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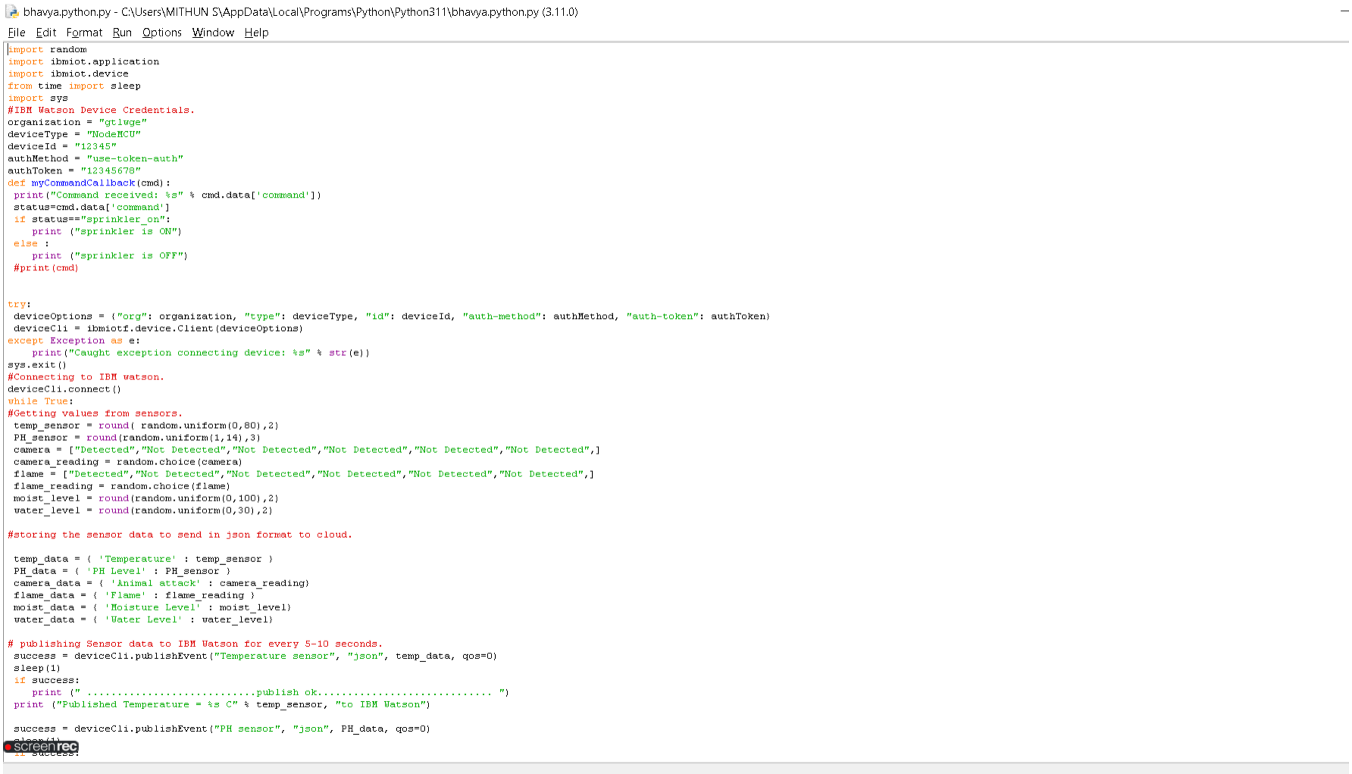

bhavya.python.py - C:\Users\MITHUN S\AppData\Local\Programs\Python\Python311\bhavya.python.py (3.11.0)
File Edit Format Run Options Window Help
screenrec

```
import random
import ibmiot.application
import ibmiot.device
from time import sleep
import sys
#IBM Watson Device Credentials.
organization = "gtlwge"
deviceType = "NodeMCU"
deviceId = "12345"
authMethod = "use-token-auth"
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)

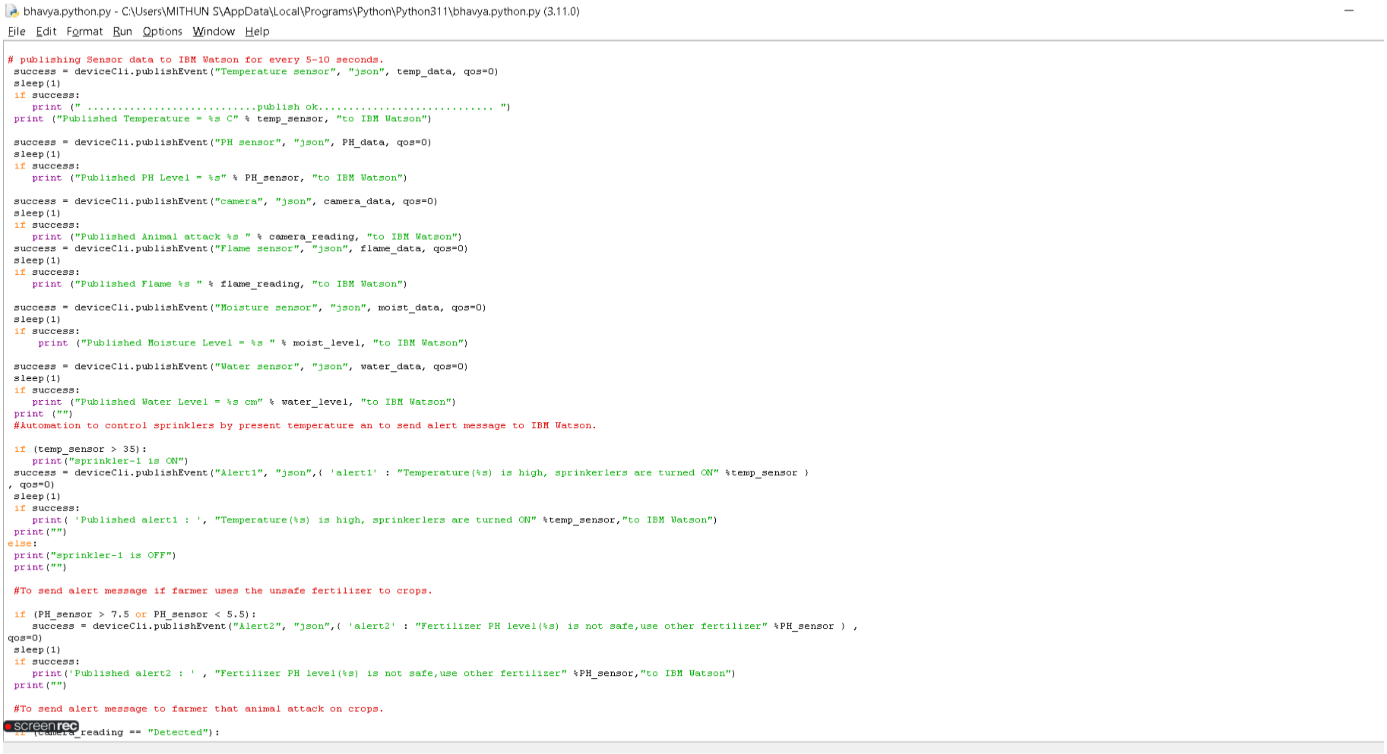

try:
 deviceOptions = {"org": organization, "type": deviceType, "id": deviceId, "auth-method": authMethod, "auth-token": authToken}
 deviceCli = ibmiotf.device.Client(deviceOptions)
except Exception as e:
    print("Caught exception connecting device: %s" % str(e))
sys.exit()
#Connecting to IBM watson.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

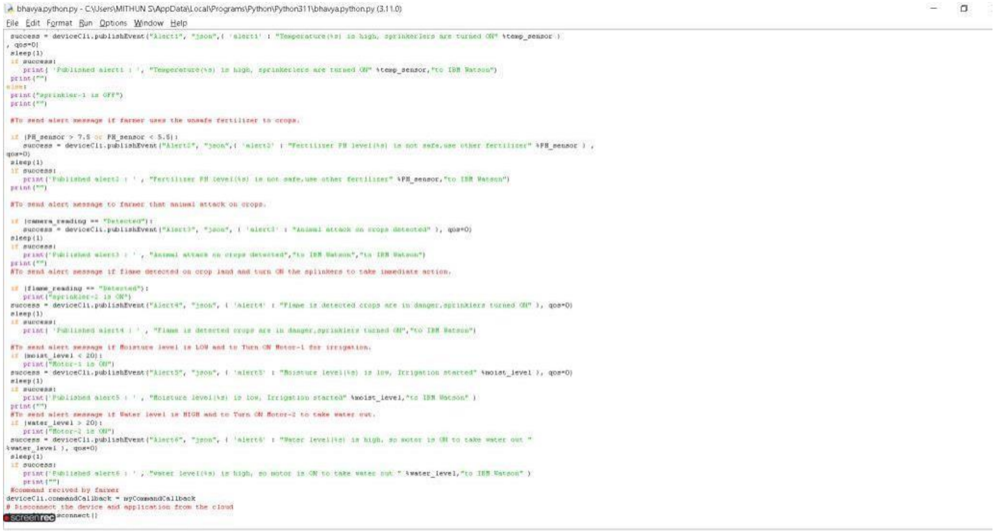
 success = deviceCli.publishEvent("Water sensor", "json", water_data, qos=0)
 sleep(1)
 if success:
    print ("Published Water Level = %s cm" % water_level, "to IBM Watson")
 print ("")
 #Automation to control sprinklers by present temperature an to send alert message to IBM Watson.

 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"):
```



bhavya.python.py - C:\Users\MITHUN S\AppData\Local\Programs\Python\Python311\bhavya.python.py (3.11.0)

```
 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.

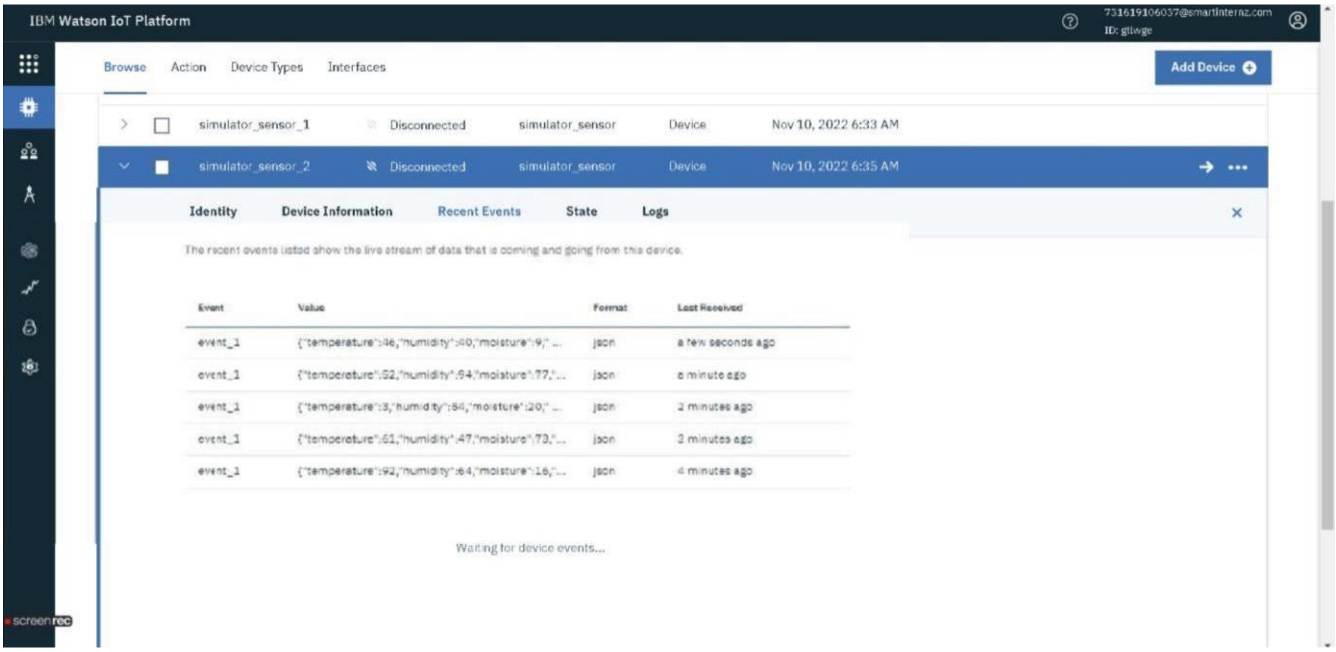
 if (PH_sensor > 7.5 or PH_sensor < 5.5):
    success = deviceCli.publishEvent("Alert2", "json",{ 'alert2' : "Fertilizer PH level(%s) is not safe,use other fertilizer" %PH_sensor } ,
qos=0)
 sleep(1)
 if success:
    print('Published alert2 : ' , "Fertilizer PH level(%s) is not safe,use other fertilizer" %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
          sconnect()
```



>	□	simulator_sensor_1	Disconnected	simulator_sensor	Device	Nov 10, 2022 6:33 AM
⌄	□	simulator_sensor_2	Disconnected	simulator_sensor	Device	Nov 10, 2022 6:35 AM

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
event_1	{"temperature":46,"humidity":40,"moisture":9,"...	json	a few seconds ago
event_1	{"temperature":52,"humidity":94,"moisture":77,"...	json	a minute ago
event_1	{"temperature":3,"humidity":64,"moisture":20,"...	json	2 minutes ago
event_1	{"temperature":61,"humidity":47,"moisture":73,"...	json	3 minutes ago
event_1	{"temperature":92,"humidity":64,"moisture":16,"...	json	4 minutes ago

Waiting for device events...