

### **Sprint - 3**

Date	12 November 2022
Team ID	PNT2022TMID47455
Project Name	Project – Real Time River water Quality Monitoring and Control system
Maximum Marks	20 marks

US-1: Developing a python script to publish random sensor data such as temperature, pH and turbidity to the IBM IoT Platform.

US-2: After developing python code, commands are received just print the statements which represent the control of the devices.

US-3: Publish data to the IBM Cloud.

### **PYTHON CODE:**

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

```
#Provide your IBM Watson Device Credentials
```

```
organization = "w1nouz"
```

```
deviceType = "riverwatermonitor1"
```

```
deviceId = "monitorsensor1"
```

```
authMethod = "token"
```

```
authToken = "!yjEh7zDC6(Cf@s&Rz"
```

```
# Initialize GPIO
```

```
def myCommandCallback(cmd):
```

```
    print("Command received: %s" % cmd.data['command'])
```

```
    status=cmd.data['command']
```

```
    if status=="Light on":
```

```
        print ("LED is on")
```

```
    else:
```

```
        print ("LED 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()
```

# Connect and send a datapoint "hello" with value "world" into the cloud as an event of type "greeting" 10 times

```
deviceCli.connect()
```

while True:

```
    #Get Sensor Data from DHT11
```

```
    temp=random.randint(0,100)
```

```
    pH=random.randint(0,100)
```

```
    turbidity = random.randint(0,100)
```

```
    data = { 'Temperature' : temp, 'pH' : pH, 'turbidity' : turbidity }
```

```
    #print data
```

```
    def myOnPublishCallback():
```

```
print ("Published Temperature = %s C" % temp, "pH = %s %" % pH,
"turbidity = %s %" % turbidity, "to IBM Watson")
```

```
success = deviceCli.publishEvent("IoTSensor", "json", data, qos=0,
on_publish=myOnPublishCallback)
```

```
if not success:
```

```
print("Not connected to IoTTF")
```

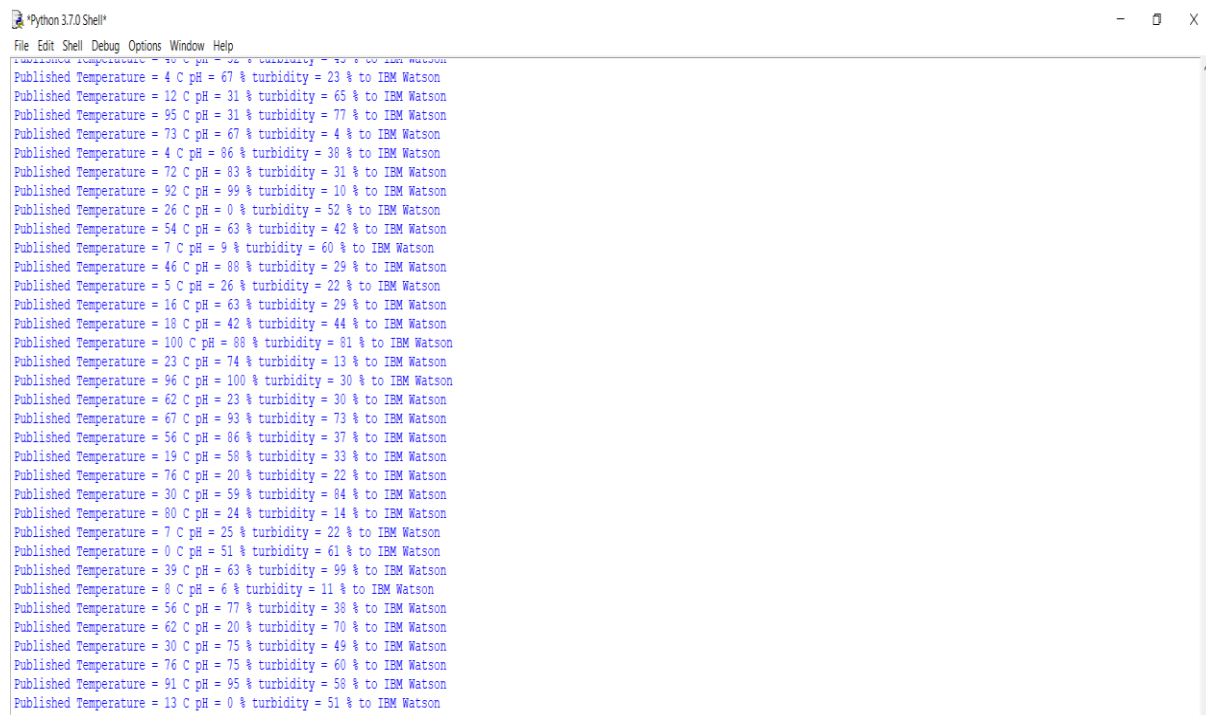
```
time.sleep(1)
```

```
deviceCli.commandCallback = myCommandCallback
```

```
# Disconnect the device and application from the cloud
```

```
deviceCli.disconnect()
```

## OUTPUT:



```
Python 3.7.0 Shell
File Edit Shell Debug Options Window Help
Published Temperature = 4 C pH = 67 % turbidity = 23 % to IBM Watson
Published Temperature = 12 C pH = 31 % turbidity = 65 % to IBM Watson
Published Temperature = 95 C pH = 31 % turbidity = 77 % to IBM Watson
Published Temperature = 73 C pH = 67 % turbidity = 4 % to IBM Watson
Published Temperature = 4 C pH = 86 % turbidity = 38 % to IBM Watson
Published Temperature = 72 C pH = 83 % turbidity = 31 % to IBM Watson
Published Temperature = 92 C pH = 99 % turbidity = 10 % to IBM Watson
Published Temperature = 26 C pH = 0 % turbidity = 52 % to IBM Watson
Published Temperature = 54 C pH = 63 % turbidity = 42 % to IBM Watson
Published Temperature = 7 C pH = 9 % turbidity = 60 % to IBM Watson
Published Temperature = 46 C pH = 88 % turbidity = 29 % to IBM Watson
Published Temperature = 5 C pH = 26 % turbidity = 22 % to IBM Watson
Published Temperature = 16 C pH = 63 % turbidity = 29 % to IBM Watson
Published Temperature = 18 C pH = 42 % turbidity = 44 % to IBM Watson
Published Temperature = 100 C pH = 88 % turbidity = 81 % to IBM Watson
Published Temperature = 23 C pH = 74 % turbidity = 13 % to IBM Watson
Published Temperature = 96 C pH = 100 % turbidity = 30 % to IBM Watson
Published Temperature = 62 C pH = 23 % turbidity = 30 % to IBM Watson
Published Temperature = 67 C pH = 93 % turbidity = 73 % to IBM Watson
Published Temperature = 56 C pH = 86 % turbidity = 37 % to IBM Watson
Published Temperature = 19 C pH = 58 % turbidity = 33 % to IBM Watson
Published Temperature = 76 C pH = 20 % turbidity = 22 % to IBM Watson
Published Temperature = 30 C pH = 59 % turbidity = 84 % to IBM Watson
Published Temperature = 80 C pH = 24 % turbidity = 14 % to IBM Watson
Published Temperature = 7 C pH = 25 % turbidity = 22 % to IBM Watson
Published Temperature = 0 C pH = 51 % turbidity = 61 % to IBM Watson
Published Temperature = 39 C pH = 63 % turbidity = 99 % to IBM Watson
Published Temperature = 8 C pH = 6 % turbidity = 11 % to IBM Watson
Published Temperature = 56 C pH = 77 % turbidity = 38 % to IBM Watson
Published Temperature = 62 C pH = 20 % turbidity = 70 % to IBM Watson
Published Temperature = 30 C pH = 75 % turbidity = 49 % to IBM Watson
Published Temperature = 76 C pH = 75 % turbidity = 60 % to IBM Watson
Published Temperature = 91 C pH = 95 % turbidity = 58 % to IBM Watson
Published Temperature = 13 C pH = 0 % turbidity = 51 % to IBM Watson
```

## In IBM Watson Platform,

The device is connected.

The screenshot displays the IBM Watson IoT Platform dashboard. The top navigation bar includes 'Browse', 'Action', 'Device Types', and 'Interfaces'. A search bar for 'Device ID' is present. The main table lists devices, with 'monitorsensor1' highlighted as 'Connected'. A detailed view for 'monitorsensor1' is shown below the table, displaying its identity, device information, recent events, state, and logs. The device information section shows: Device ID: monitorsensor1, Device Type: riverwatermonitor1, Date Added: Nov 6, 2022 9:03 PM, Added By: 910019106002@smartinternz.com, and Connection Status: Connected (Connection Time: Nov 11, 2022 8:00 AM, Client Address: 223.181.238.221 SecureToken). The bottom of the table shows 'sensor24' as 'Disconnected'.

Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
monitorsensor1	Connected	riverwatermonitor1	Device	Nov 11, 2022 7:58 AM	
sensor24	Disconnected	rivermonitor	Device	Nov 4, 2022 12:30 PM	

The data is sending to the cloud by running the python code.

The screenshot shows the 'Device Drilldown - monitorsensor1' page in the IBM Watson IoT Platform. The left sidebar contains links for 'Device Credentials', 'Connection Information', 'Recent Events', 'State', 'Device Information', 'Metadata', 'Diagnostics', 'Connection Logs', and 'Device Actions'. The main content area displays 'Recent Events' and 'State'. The 'Recent Events' section shows a list of events with columns 'Event' and 'Value'. The 'State' section shows a table of data points reported by the device.

Event	Value
IoTSensor	{"Temperature":39,"pH":10,"turbidity":53}
IoTSensor	{"Temperature":65,"pH":19,"turbidity":31}
IoTSensor	{"Temperature":98,"pH":21,"turbidity":99}
IoTSensor	{"Temperature":13,"pH":91,"turbidity":88}
IoTSensor	{"Temperature":0,"pH":2,"turbidity":36}

**State**

This table shows a list of data points that are reported by this device

```
Published Temperature = 59 C pH = 13 % turbidity = 83 % to IBM Watson
Published Temperature = 64 C pH = 44 % turbidity = 93 % to IBM Watson
Published Temperature = 73 C pH = 79 % turbidity = 93 % to IBM Watson
Published Temperature = 70 C pH = 68 % turbidity = 4 % to IBM Watson
Published Temperature = 93 C pH = 90 % turbidity = 82 % to IBM Watson
Published Temperature = 61 C pH = 29 % turbidity = 86 % to IBM Watson
Published Temperature = 63 C pH = 64 % turbidity = 57 % to IBM Watson
Published Temperature = 18 C pH = 71 % turbidity = 9 % to IBM Watson
Published Temperature = 80 C pH = 74 % turbidity = 34 % to IBM Watson
Published Temperature = 62 C pH = 24 % turbidity = 35 % to IBM Watson
Published Temperature = 31 C pH = 78 % turbidity = 96 % to IBM Watson
Published Temperature = 41 C pH = 40 % turbidity = 29 % to IBM Watson
Published Temperature = 63 C pH = 96 % turbidity = 66 % to IBM Watson
Published Temperature = 46 C pH = 13 % turbidity = 42 % to IBM Watson
Published Temperature = 93 C pH = 29 % turbidity = 55 % to IBM Watson
Published Temperature = 39 C pH = 19 % turbidity = 54 % to IBM Watson
Published Temperature = 56 C pH = 75 % turbidity = 3 % to IBM Watson
Published Temperature = 60 C pH = 94 % turbidity = 81 % to IBM Watson
Published Temperature = 62 C pH = 76 % turbidity = 31 % to IBM Watson
Published Temperature = 66 C pH = 15 % turbidity = 50 % to IBM Watson
Published Temperature = 19 C pH = 65 % turbidity = 39 % to IBM Watson
Published Temperature = 65 C pH = 24 % turbidity = 73 % to IBM Watson
Published Temperature = 64 C pH = 33 % turbidity = 97 % to IBM Watson
Published Temperature = 68 C pH = 19 % turbidity = 0 % to IBM Watson
Published Temperature = 72 C pH = 78 % turbidity = 35 % to IBM Watson
Published Temperature = 62 C pH = 15 % turbidity = 90 % to IBM Watson
Published Temperature = 44 C pH = 64 % turbidity = 48 % to IBM Watson
Published Temperature = 53 C pH = 62 % turbidity = 82 % to IBM Watson
Published Temperature = 17 C pH = 0 % turbidity = 76 % to IBM Watson
Published Temperature = 90 C pH = 80 % turbidity = 90 % to IBM Watson
Published Temperature = 32 C pH = 15 % turbidity = 64 % to IBM Watson
Published Temperature = 67 C pH = 77 % turbidity = 17 % to IBM Watson
Published Temperature = 43 C pH = 76 % turbidity = 37 % to IBM Watson
Published Temperature = 47 C pH = 75 % turbidity = 18 % to IBM Watson
Published Temperature = 95 C pH = 12 % turbidity = 88 % to IBM Watson
Published Temperature = 58 C pH = 50 % turbidity = 52 % to IBM Watson
Published Temperature = 52 C pH = 29 % turbidity = 24 % to IBM Watson
Published Temperature = 53 C pH = 18 % turbidity = 85 % to IBM Watson
Published Temperature = 34 C pH = 81 % turbidity = 9 % to IBM Watson
Published Temperature = 62 C pH = 77 % turbidity = 5 % to IBM Watson
Published Temperature = 24 C pH = 63 % turbidity = 93 % to IBM Watson
Published Temperature = 0 C pH = 2 % turbidity = 36 % to IBM Watson
Published Temperature = 13 C pH = 91 % turbidity = 88 % to IBM Watson
Published Temperature = 98 C pH = 21 % turbidity = 99 % to IBM Watson
Published Temperature = 65 C pH = 19 % turbidity = 31 % to IBM Watson
Published Temperature = 39 C pH = 10 % turbidity = 53 % to IBM Watson
```

Fig 1

```
Python 3.7.0 Shell
File Edit Shell Debug Options Window Help
Published Temperature = 4 C pH = 67 % turbidity = 23 % to IBM Watson
Published Temperature = 12 C pH = 31 % turbidity = 65 % to IBM Watson
Published Temperature = 95 C pH = 31 % turbidity = 77 % to IBM Watson
Published Temperature = 73 C pH = 67 % turbidity = 4 % to IBM Watson
Published Temperature = 4 C pH = 86 % turbidity = 38 % to IBM Watson
Published Temperature = 72 C pH = 83 % turbidity = 31 % to IBM Watson
Published Temperature = 92 C pH = 99 % turbidity = 10 % to IBM Watson
Published Temperature = 26 C pH = 0 % turbidity = 52 % to IBM Watson
Published Temperature = 54 C pH = 63 % turbidity = 42 % to IBM Watson
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Published Temperature = 5 C pH = 26 % turbidity = 22 % to IBM Watson
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Published Temperature = 23 C pH = 74 % turbidity = 13 % to IBM Watson
Published Temperature = 96 C pH = 100 % turbidity = 30 % to IBM Watson
Published Temperature = 62 C pH = 23 % turbidity = 30 % to IBM Watson
Published Temperature = 67 C pH = 93 % turbidity = 73 % to IBM Watson
Published Temperature = 56 C pH = 86 % turbidity = 37 % to IBM Watson
Published Temperature = 19 C pH = 58 % turbidity = 33 % to IBM Watson
Published Temperature = 76 C pH = 20 % turbidity = 22 % to IBM Watson
Published Temperature = 30 C pH = 59 % turbidity = 84 % to IBM Watson
Published Temperature = 80 C pH = 24 % turbidity = 14 % to IBM Watson
Published Temperature = 7 C pH = 25 % turbidity = 22 % to IBM Watson
Published Temperature = 0 C pH = 51 % turbidity = 61 % to IBM Watson
Published Temperature = 39 C pH = 63 % turbidity = 99 % to IBM Watson
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Published Temperature = 62 C pH = 20 % turbidity = 70 % to IBM Watson
Published Temperature = 30 C pH = 75 % turbidity = 49 % to IBM Watson
Published Temperature = 76 C pH = 75 % turbidity = 60 % to IBM Watson
Published Temperature = 91 C pH = 95 % turbidity = 58 % to IBM Watson
Published Temperature = 13 C pH = 0 % turbidity = 51 % to IBM Watson
```

Fig 2

IBM Watson IoT Platform

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ID: w1nouz

Browse Action Device Types Interfaces

Add Device

Identity Device Information Recent Events State Logs

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

Event	Value	Format	Last Received
IoTSensor	{"Temperature":62,"pH":9,"turbidity":76}	json	a few seconds ago
IoTSensor	{"Temperature":12,"pH":87,"turbidity":44}	json	a few seconds ago
IoTSensor	{"Temperature":28,"pH":88,"turbidity":54}	json	a few seconds ago
IoTSensor	{"Temperature":85,"pH":91,"turbidity":67}	json	a few seconds ago
IoTSensor	{"Temperature":86,"pH":25,"turbidity":39}	json	a few seconds ago

> ☐ sensor24 ☐ Disconnected rivermonitor Device Nov 4, 2022 12:30 PM

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Fig 3