

PROJECT DEVELOPMENT PHASE

SPRINT 1

Date	13 November 2022
Team ID	PNT2022TMID38637
Project name	Real –time river water quality monitoring and control system
Maximum marks	2 marks

ANALYZE THE PREREQUISITES

Needed prerequisites for real time river water quality monitoring and control system using Internet Of Things (IoT) were

- ❖ IBM Watson IoT Platform
- ❖ Node-RED Service
- ❖ Cloudant DB

Python code:

```
#IBM Watson IOT Platform
import time
import sys
import ibmiotf.application
import ibmiotf.device
import random
```

```
#provide Your IBM Watson
Device Credentials
organization = "uwobmo"
deviceType = "Indira"
deviceId = "26"
authMethod = "token"
authToken = "12345678"
```

```
#Initialize GPIO
def
myCommandCallback(cmd
):
    print ("command
received: %s"
%cmd.data['command'])

status=cmd.data['comman
d']
    if status=="LIGHT ON":
        print ("led is on")
    elif status == "LIGHT
OFF":
        print ("led is off")
    else:
        print ("please send
```

```

proper command")
try:
    deviceOptions =
{'org':organization,'type':de
viceType,'id':deviceID,'auth
-method':authMethod,
'auth-token': authToken}
    deviceCli =
ibmiotf.device.Client(devic
eOptions)

#.....
.....

except Exception as e:
    print("caught
exception connecting
device:%s" % str(e))
    sys.exit()

# connect and send a
datapoint "hello"with value
"world" info the cloud as
an event of
type"greetings"10 times
deviceCli.connect()

while True:
    #Get sensor Data
    from DHT11

    Temperature=random.rand
int(90,110)

    pH=random.randint(0,14)

    Turbidity=random.randint(
0,100)
    data = { 'Temperature'
: Temperature, 'pH': pH,
'Turbidity':Turbidity }
    #print data
    def
myOnPublishCallback():
        print ("published
Temperature = %s C" %
Temperature, "pH = is %s
%%" % pH, "Turbidity= is
%s %%" % Turbidity,"to
IBM Watson")

    success =
deviceCli.publishEvent("IO
TSensor",

```

```
"json",data,qos=0,on_publish=
myOnPublishCallback)
    if not success:
        print("Not
connected to IOTF")
        time.sleep(10)
```

```
deviceCli.commandCallback = myCommandCallback
# Disconnect the device
and application from the
cloud
deviceCli.disconnect()
```

```
ibmiotpublish.py - C:\Users\V.IndraPriyadarshni\AppData\Local\Programs\Python\Python37\ibmiotpublish.py (3.7.0)
File Edit Format Run Options Window Help

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

#provide Your IBM Watson Device Credentials
organization = "uwobmo"
deviceType = "Indira"
deviceID = "26"
authMethod = "token"
authToken = "12345678"

#Initialize GPIO
def myCommandCallback(cmd):
    print ("command received: %s" %cmd.data['command'])
    status=cmd.data['command']
    if status=="LIGHT ON":
        print ("led is on")
    elif status == "LIGHT OFF":
        print ("led is off")
    else:
        print ("please send proper command")

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" info the cloud as an event of type" greetings"10 times
deviceCli.connect()

while True:
    #Get sensor Data from DHT11
    |
    Temperature=random.randint(90,110)
    pH=Random.randint(0,14)
    Turbidity=random.randint(0,100)
    data = { 'Temperature' : Temperature, 'pH': pH, 'Turbidity':Turbidity }
    #print data
    def myOnPublishCallback():
        print ("published Temperature = %s C" % Temperature, "pH = is %s %" % pH, "Turbidity= is %s %" % Turbidity,"to IBM Watson")
```

Ln: 40 Col: 0

```
*Python 3.7.0 Shell*
File Edit Shell Debug Options Window Help

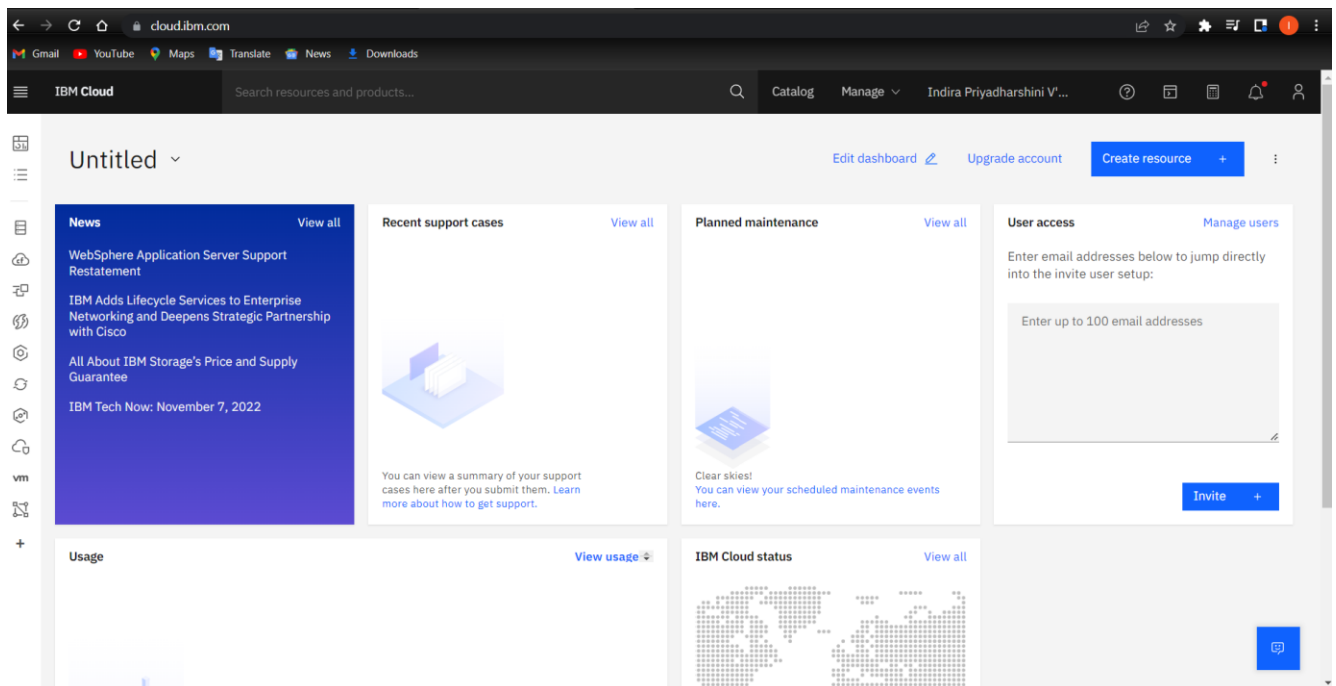
led is on
published Temperature = 103 C pH = is 10 % Turbidity= is 66 % to IBM Watson
published Temperature = 100 C pH = is 4 % Turbidity= is 60 % to IBM Watson
published Temperature = 105 C pH = is 11 % Turbidity= is 43 % to IBM Watson
published Temperature = 97 C pH = is 8 % Turbidity= is 73 % to IBM Watson
published Temperature = 94 C pH = is 9 % Turbidity= is 19 % to IBM Watson

RESTART: C:\Users\V.IndraPriyadarshni\AppData\Local\Programs\Python\Python37\ibmiotpublish.py
2022-11-13 19:07:31 INFO ibmraef.device.Client INFO Connected successfully: druwobmo:Indira:26
published Temperature = 103 C pH = is 6 % Turbidity= is 57 % to IBM Watson
published Temperature = 104 C pH = is 11 % Turbidity= is 73 % to IBM Watson
published Temperature = 98 C pH = is 12 % Turbidity= is 16 % to IBM Watson
published Temperature = 96 C pH = is 2 % Turbidity= is 30 % to IBM Watson
published Temperature = 99 C pH = is 0 % Turbidity= is 66 % to IBM Watson
command received: LIGHT OFF
led is off
published Temperature = 90 C pH = is 0 % Turbidity= is 83 % to IBM Watson
published Temperature = 105 C pH = is 0 % Turbidity= is 29 % to IBM Watson
published Temperature = 98 C pH = is 13 % Turbidity= is 74 % to IBM Watson
published Temperature = 101 C pH = is 14 % Turbidity= is 93 % to IBM Watson
published Temperature = 109 C pH = is 10 % Turbidity= is 87 % to IBM Watson
published Temperature = 98 C pH = is 2 % Turbidity= is 60 % to IBM Watson
published Temperature = 109 C pH = is 7 % Turbidity= is 100 % to IBM Watson
published Temperature = 97 C pH = is 14 % Turbidity= is 79 % to IBM Watson
command received: LIGHT ON
led is on
published Temperature = 99 C pH = is 7 % Turbidity= is 56 % to IBM Watson
published Temperature = 92 C pH = is 4 % Turbidity= is 92 % to IBM Watson
published Temperature = 93 C pH = is 14 % Turbidity= is 83 % to IBM Watson
published Temperature = 91 C pH = is 6 % Turbidity= is 63 % to IBM Watson
published Temperature = 107 C pH = is 3 % Turbidity= is 5 % to IBM Watson
published Temperature = 100 C pH = is 5 % Turbidity= is 25 % to IBM Watson
published Temperature = 90 C pH = is 7 % Turbidity= is 60 % to IBM Watson
published Temperature = 99 C pH = is 3 % Turbidity= is 85 % to IBM Watson
published Temperature = 98 C pH = is 6 % Turbidity= is 63 % to IBM Watson
published Temperature = 100 C pH = is 9 % Turbidity= is 64 % to IBM Watson
published Temperature = 104 C pH = is 1 % Turbidity= is 83 % to IBM Watson
published Temperature = 110 C pH = is 11 % Turbidity= is 58 % to IBM Watson
command received: LIGHT ON
led is on
command received: LIGHT ON
led is on
command received: LIGHT OFF
led is off
published Temperature = 104 C pH = is 9 % Turbidity= is 56 % to IBM Watson
command received: LIGHT OFF
led is off
```

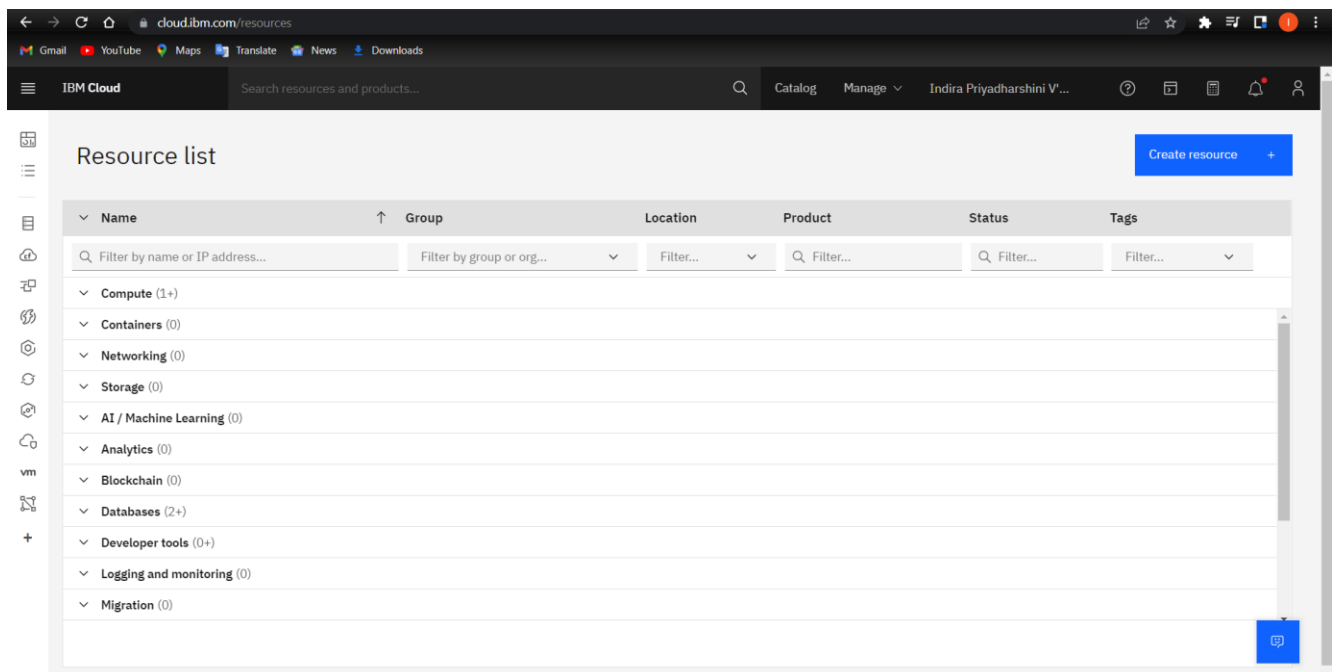
Ln: 708 Col: 0

Code runs successfully and random output values are generated

Creation of IBM cloud



Procedure for the creation of IBM IOT watson



Device creation

IBM Project: 14021-1659538996 x IBM Service Details - IBM Cloud x IBM Watson IoT Platform x

uwobmo.internetofthings.ibmcloud.com/dashboard/devices/browse

Gmail YouTube Maps Translate News Downloads

IBM Watson IoT Platform 420419106014@smartinternz.com ID: uwobmo

Browse Action Device Types Interfaces Add Device

Browse Devices

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 101

<input type="checkbox"/>	Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
> <input type="checkbox"/>	26	Disconnected	Indira	Device	Nov 11, 2022 11:31 AM	

Items per page 50 | 1-1 of 1 item 1 of 1 page < 1 >

1 Simulation running

uwobmo.internetofthings.ibmcloud.com/dashboard/devices/browse

Gmail YouTube Maps Translate News Downloads

IBM Watson IoT Platform 420419106014@smartinternz.com ID: uwobmo

Browse Action Device Types Interfaces Add Device

1 Simulation running

Search by Device ID Device Simulator 101

<input type="checkbox"/>	Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
▼ <input type="checkbox"/>	26	Disconnected	Indira	Device	Nov 11, 2022 11:31 AM	→ ...

Identity Device Information Recent Events State Logs

Device ID 26

Device Type Indira

Date Added Nov 11, 2022 11:31 AM

Added By 420419106014@smartinternz.com

Connection Status **Disconnected**
Last Connected: Nov 13, 2022 8:02 PM
Client Address: 202.21.43.183 SecureToken
Duration: 7 minutes
Data Transferred: 5.0 KB

1 Simulation running

Generation of random values in IBM Watson

The screenshot displays the IBM Watson IoT Platform interface. At the top, the browser address bar shows the URL `uwobmo.internetofthings.ibmcloud.com/dashboard/devices/browse`. The page header includes the IBM Watson IoT Platform logo and a user profile with email `420419106014@smartinternz.com` and ID `uwobmo`. The main navigation bar contains tabs for **Browse**, **Action**, **Device Types**, and **Interfaces**. A search bar labeled "Search by Device ID" is present. On the right, there is a "Device Simulator" toggle switch and an "Add Device" button.

The central table lists devices with columns: **Device ID**, **Status**, **Device Type**, **Class ID**, **Date Added**, and **Descriptive Location**. A device with ID 26 is highlighted, showing a status of "Disconnected" and a type of "Indira".

Below the device list, a modal window titled "Recent Events" is open, showing a table of live data streams. The table has columns: **Event**, **Value**, **Format**, and **Last Received**. The events are generated by an "IotSensor" and contain JSON data for Turbidity, Temperature, and pH.

Event	Value	Format	Last Received
IotSensor	{"Turbidity":47,"Temperature":92,"pH":10}	json	a few seconds ago
IotSensor	{"Turbidity":95,"Temperature":91,"pH":3}	json	a few seconds ago
IotSensor	{"Turbidity":18,"Temperature":91,"pH":7}	json	a few seconds ago
IotSensor	{"Turbidity":87,"Temperature":91,"pH":14}	json	a few seconds ago
IotSensor	{"Turbidity":64,"Temperature":92,"pH":14}	json	a few seconds ago

At the bottom right of the interface, a status indicator shows "1 Simulation running".