


SPRINT-2

Project : Smart Waste Management System For Metropolitan Cities

Team ID :PNT2022TMID03950

- Python code for smart garbage bin is programmed. The cloud server's libraries are imported into the Python code for the smart waste bin.

A screenshot of a Python IDE window titled 'smart.py - C:\Users\HARI\Desktop\smart.py (3.7.1)'. The window has a menu bar with 'File', 'Edit', 'Format', 'Run', 'Options', 'Window', and 'Help'. The code is written in a light blue font on a white background. It includes imports for 'time', 'sys', 'ibmiotf.application', 'ibmiotf.device', and 'random'. There are comments in red for providing IBM Watson Device Credentials and initializing GPIO. The code defines a function 'myCommandCallback(cmd)' that prints the received command and its status. A 'try:' block is partially visible, showing the initialization of 'deviceOptions' and the creation of a 'deviceCli' object.

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

#Provide your IBM Watson Device Credentials
organization = "z7l8rv"
deviceType = "bin"
deviceId = "smartbin45"
authMethod = "token"
authToken = "987654321"

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

try:
    deviceOptions = {"org": organization, "type": deviceType, "id": deviceId, "a
    deviceCli = ibmiotf.device.Client(deviceOptions)
```

- The cloud server is connected to the IOT device in the trash can. Now, the server will receive signals indicating that the trash can is full from the iot device there in trash can.

```
smart.py - C:\Users\HARI\Desktop\smart.py (3.7.1)
File Edit Format Run Options Window Help
deviceCli = IoTDeviceClient(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
deviceCli.connect()

while True:
    #Get Sensor Data from ultrasonic sensor

    t=random.randint(0,100)
    a="BIN IS GOING TO FULL" if t>=90 else "BIN IS AVAILABLE TO COLLECT WASTE"
    latitude=13.082680
    longitude=80.270721
    data = { 'BIN LEVEL' : t , "status" : a, 'latitude' : latitude, 'longitude' : l

    #print data
    def myOnPublishCallback():
        print ("BIN LEVEL = %s"% t, "BIN STATUS = %s"% a)

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```

- The status of the bin is checked when the garbage bin levels are constructed using random variables and functions.

```
smart.py - C:\Users\HARI\Desktop\smart.py (3.7.1)
File Edit Format Run Options Window Help

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    a="BIN IS GOING TO FULL" if t>=90 else "BIN IS AVAILABLE TO COLLECT WASTE"
    latitude=13.082680
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    data = { 'BIN LEVEL' : t , "status" : a, 'latitude' : latitude, 'longitude' : l

    #print data
    def myOnPublishCallback():
        print ("BIN LEVEL = %s"% t, "BIN STATUS = %s"% a)

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

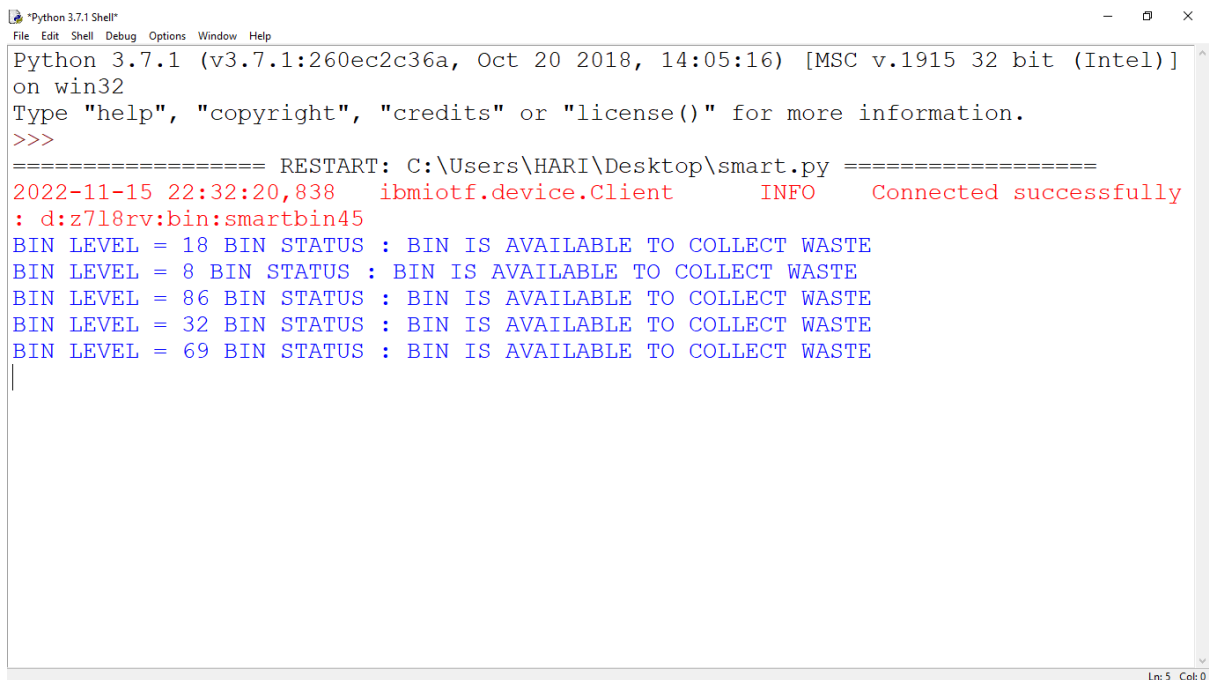
    if not success:
        print("Not connected to IoT")
        time.sleep(10)

    deviceCli.commandCallback = myCommandCallback

# Disconnect the device and application from the cloud
deviceCli.disconnect()

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```

- Connect the trash can to the cloud server and check the garbage can levels to see if they are full or not.
- The cloud will receive a notification that the bin is full and open for garbage collection if the value of the bin is greater than 90. The appropriate authority will be informed of the bin's GPS location.



```
Python 3.7.1 (v3.7.1:260ec2c36a, Oct 20 2018, 14:05:16) [MSC v.1915 32 bit (Intel)]
on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:\Users\HARI\Desktop\smart.py =====
2022-11-15 22:32:20,838 ibmiotf.device.Client INFO Connected successfully
: d:z7l8rv:bin:smartbin45
BIN LEVEL = 18 BIN STATUS : BIN IS AVAILABLE TO COLLECT WASTE
BIN LEVEL = 8 BIN STATUS : BIN IS AVAILABLE TO COLLECT WASTE
BIN LEVEL = 86 BIN STATUS : BIN IS AVAILABLE TO COLLECT WASTE
BIN LEVEL = 32 BIN STATUS : BIN IS AVAILABLE TO COLLECT WASTE
BIN LEVEL = 69 BIN STATUS : BIN IS AVAILABLE TO COLLECT WASTE
|
```

- Using random variables and functions the level of the garbage bin is found and notified to the server and the appropriate authority will send the GPS location of the garbage can so that the waste can be collected.

smart.py - C:\Users\HAR\Desktop\smart.py (3.7.1)
File Edit Format Run Options Window Help

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Python 3.7.1 Shell
File Edit Shell Debug Options Window Help

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ABLE TO COLLECT WASTE
BIN LEVEL = 69 BIN STATUS : BIN IS AVAIL
ABLE TO COLLECT WASTE
BIN LEVEL = 50 BIN STATUS : BIN IS AVAIL
ABLE TO COLLECT WASTE
```

Ln: 15 Col: 0