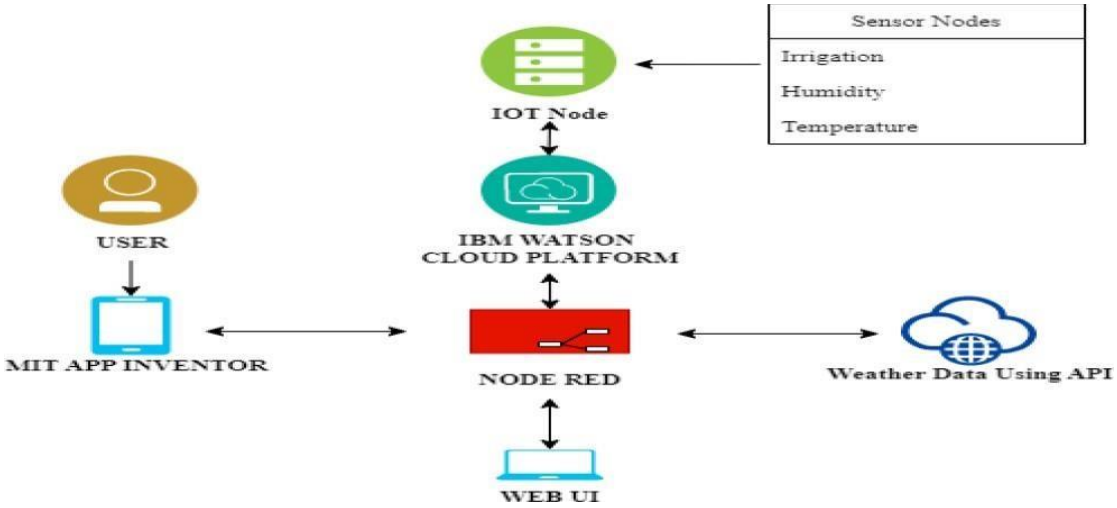
Project Development

Delivery of Sprint-4

Date	17 NOV 2022
Team ID	PNT2022TMID26544
Project Name	Project -Smart farmer-IOT enabled smart Farming Application

Flow Diagram



Python Code:

- For Connecting IBM Cloud
- For NODE RED
- Weather Map Information
- MIT App Inventor

```
#IBM Watson IOT Platform
#pip install wiotp-sdk import
wiotp.sdk.device import
time
import random import
requests, json

ms=0
# Enter your API key here
api_key = "a0db30a689a774b93ffcb58ef2eddfda"
# base_url variable to store url
base_url = "http://api.openweathermap.org/data/2.5/weather?"
# Give city name city_name
= 'Chennai, IN'
# complete_url variable to store
# complete url address
complete_url = base_url + "appid=" + api_key + "&q=" + city_name

status='motor off' myConfig
= {
   "identity": {
      "orgId": "17lsro",
      "typeId": "MyDeviceType",
      "deviceId":"12345"
   },
   "auth": {
```

```
        "token": "GkatKdiUS?UVHKvnAD"


    } }
def
myC
om
ma
ndC
allb
ack(
cmd
):
    print("Message received from IBM IoT Platform: %s" %
cmd.data['command'])
    m=cmd.data['command'] if(m=="MOTOR
    ON"):#if motor is on
        print("MOTOR IS ON") global
        status status='motor on'
        myData={'temperature':temp,
'humidity':hum,'soilmoisture':sm_percentage,'status':status,'api_temperature':
api_temperature,'api_pressure':api_pressure,'api_humidity':api_humidity,'api
_weather_description':api_weather_description}
        client.publishEvent(eventId="status", msgFormat="json", data=myData,
qos=0, onPublish=None) print("Published data
        Successfully: %s", myData)
```

```
        time.sleep(2)

    elif(m=="MOTOR OFF"):#if motor is off
        print("MOTOR IS OFF")

        status='motor                                    off'
        myData={'temperature':temp,
'humidity':hum,'soilmoisture':sm_percentage,'status':status,'api_temperature':
api_temperature,'api_pressure':api_pressure,'api_humidity':api_humidity,'api
_weather_description':api_weather_description}
        client.publishEvent(eventId="status", msgFormat="json", data=myData,
qos=0,    onPublish=None)    print("Published    data
        Successfully: %s", myData) time.sleep(2)



client    =    wiotp.sdk.device.DeviceClient(config=myConfig,    logHandlers=None)
client.connect()

while True:
    # get method of requests module #
    return response object response =
    requests.get(complete_url)
    # json method of response object
    # convert json format data into
    # python format data x =
    response.json()
```

```
    # Now x contains list of nested dictionaries
    # Check the value of "cod" key is equal to
    # "404", means city is found otherwise,
    # city is not found if
    x["cod"] != "404":




        y = x["main"]

        api_temperature = y["temp"]#getting api temperature data



        api_pressure = y["pressure"]#getting api pressure data



        api_humidity = y["humidity"] #getting api humidity data



        z = x["weather"]



        api_weather_description = z[0]["description"]#getting api weather
condition data
```

```
    temp=random.randint(-20,125)#geneating ranom values for temperature
    hum=random.randint(0,100)#geneating ranom values for humidity
    soilmoisture=random.randint(0,1023)#analog sensor
    sm_percentage=(soilmoisture/1023)*100
    sm_percentage=int(sm_percentage)#geneating ranom values for
soilmoisture myData={'temperature':temp,
'humidity':hum,'soilmoisture':sm_percentage,'status':status,'api_temperature':
api_temperature,'api_pressure':api_pressure,'api_humidity':api_humidity,'api
_weather_description':api_weather_description}
client.publishEvent(eventId="status",  msgFormat="json",  data=myData,
qos=0, onPublish=None)
    print("Published data Successfully: %s", myData)
    client.commandCallback = myCommandCallback
    time.sleep(2)


time.sleep(2) client.disconnect()
```

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```
#IBM Watson IOT Platform
#pip install wiotp-sdk
import wiotp.sdk.device
import time
import random
import requests, json

ms=0
# Enter your API key here
api_key = "a0db30a689a774b93ffcb58ef2eddfda"
# base_url variable to store url
base_url = "http://api.openweathermap.org/data/2.5/weather?"
# Give city name
city_name = 'Chennai, IN'
# complete_url variable to store
# complete url address
complete_url = base_url + "appid=" + api_key + "&q=" + city_name

status='motor off'
myConfig = {
    "identity": {
        "orgId": "17lsro",
        "typeId": "MyDeviceType",
        "deviceId":"12345"
    },
    "auth": {
        "token": "GkatKdiUS?UVHKvnAD"
    }
}

def myCommandCallback(cmd):
    print("Message received from IBM IoT Platform: %s" % cmd.data['command'])
    m=cmd.data['command']
    if(m=="MOTOR ON"):#if motor is on
        print("MOTOR  IS ON")
        global status
        status='motor on'
        myData={'temperature':temp, 'humidity':hum,'soilmoisture':sm_percentage,'status':status,'api_temperature':api_temperature,'api_pressure':api_pressure
        client.publishEvent(eventId="status", msgFormat="json", data=myData, qos=0, onPublish=None)
        print("Published data Successfully: %s", myData)
```

```
client = wiotp.sdk.device.DeviceClient(config=myConfig, logHandlers=None)
client.connect()

while True:
    # get method of requests module
    # return response object
    response = requests.get(complete_url)
    # json method of response object
    # convert json format data into
    # python format data
    x = response.json()
    # Now x contains list of nested dictionaries
    # Check the value of "cod" key is equal to
    # "404", means city is found otherwise,
    # city is not found
    if x["cod"] != "404":



        y = x["main"]


        api_temperature = y["temp"]#getting api temperature data


        api_pressure = y["pressure"]#getting api pressure data


        api_humidity = y["humidity"] #getting api humidity data


        z = x["weather"]


        api_weather_description = z[0]["description"]#getting api weather condition data
```

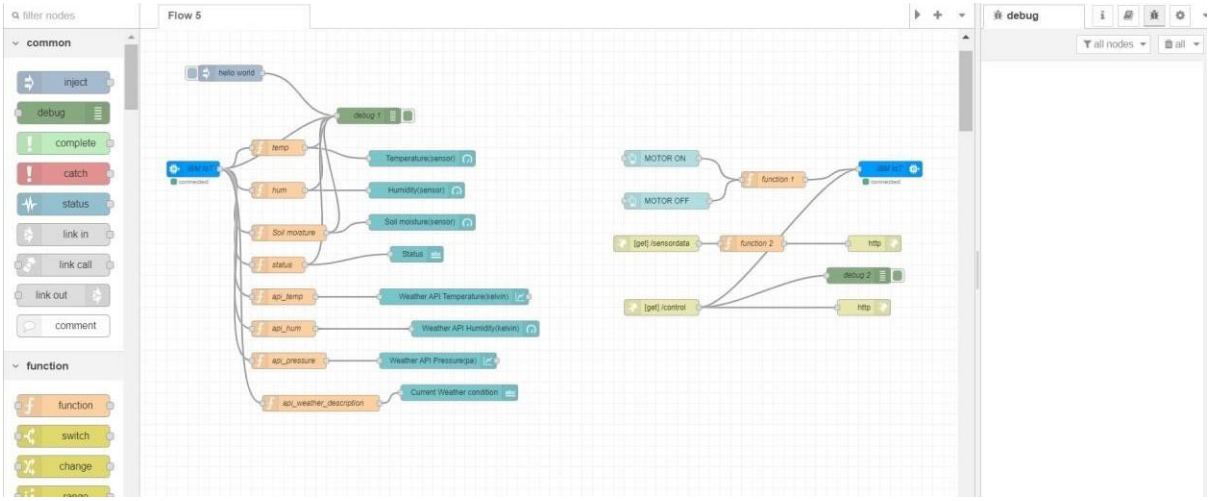
```
    temp=random.randint(-20,125)#geneating ranom values for temperature
    hum=random.randint(0,100)#geneating ranom values for humidity
    soilmoisture=random.randint(0,1023)#analog sensor
    sm_percentage=(soilmoisture/1023)*100
    sm_percentage=int(sm_percentage)#geneating ranom values for soilmoisture
    myData={'temperature':temp, 'humidity':hum,'soilmoisture':sm_percentage,'status':status,'api_temperature':api_temperature,'api_pressure':api_pressure,'ap
    client.publishEvent(eventId="status", msgFormat="json", data=myData, qos=0, onPublish=None)
    print("Published data Successfully: %s", myData)
    client.commandCallback = myCommandCallback
    time.sleep(2)

time.sleep(2)
client.disconnect()
```

Running Module

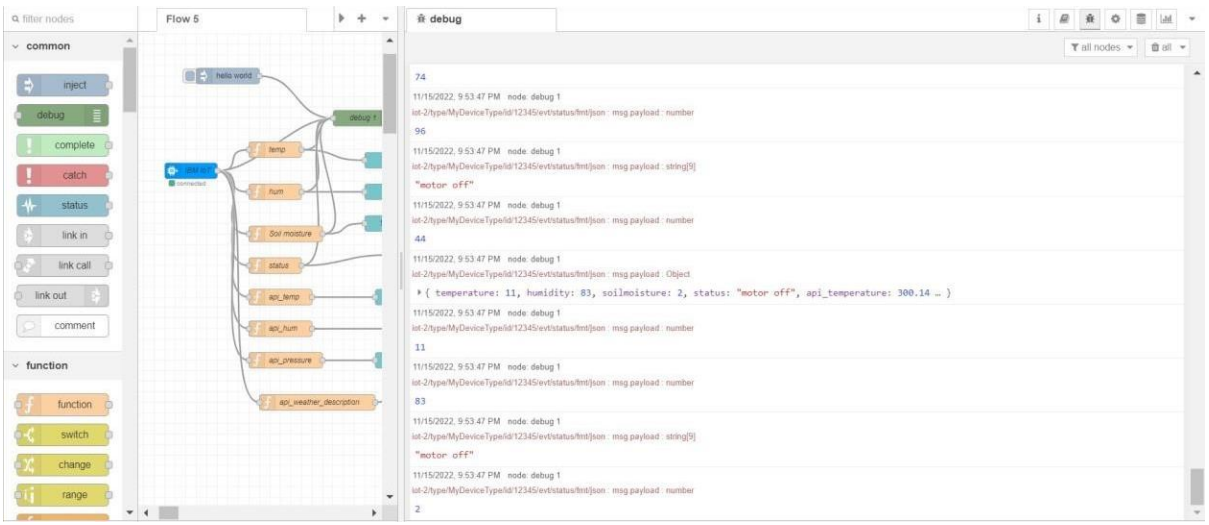
```
Published data Successfully: %s {'temperature': 60, 'humidity': 34, 'soilmoisture': 57, 'status': 'motor off', 'api_temperature': 300.14, 'api_pressure': 10
13, 'api_humidity': 83, 'api_weather_description': 'mist'}
Published data Successfully: %s {'temperature': 96, 'humidity': 85, 'soilmoisture': 70, 'status': 'motor off', 'api_temperature': 300.14, 'api_pressure': 10
13, 'api_humidity': 83, 'api_weather_description': 'mist'}
Published data Successfully: %s {'temperature': 93, 'humidity': 3, 'soilmoisture': 8, 'status': 'motor off', 'api_temperature': 300.14, 'api_pressure': 1013
, 'api_humidity': 83, 'api_weather_description': 'mist'}
Published data Successfully: %s {'temperature': 50, 'humidity': 23, 'soilmoisture': 60, 'status': 'motor off', 'api_temperature': 300.14, 'api_pressure': 10
13, 'api_humidity': 83, 'api_weather_description': 'mist'}
Published data Successfully: %s {'temperature': 76, 'humidity': 16, 'soilmoisture': 94, 'status': 'motor off', 'api_temperature': 300.14, 'api_pressure': 10
13, 'api_humidity': 83, 'api_weather_description': 'mist'}
Published data Successfully: %s {'temperature': 86, 'humidity': 51, 'soilmoisture': 56, 'status': 'motor off', 'api_temperature': 300.14, 'api_pressure': 10
13, 'api_humidity': 83, 'api_weather_description': 'mist'}
Published data Successfully: %s {'temperature': -6, 'humidity': 27, 'soilmoisture': 22, 'status': 'motor off', 'api_temperature': 300.14, 'api_pressure': 10
13, 'api_humidity': 83, 'api_weather_description': 'mist'}
Published data Successfully: %s {'temperature': 59, 'humidity': 62, 'soilmoisture': 13, 'status': 'motor off', 'api_temperature': 300.14, 'api_pressure': 10
13, 'api_humidity': 83, 'api_weather_description': 'mist'}
Published data Successfully: %s {'temperature': 12, 'humidity': 4, 'soilmoisture': 81, 'status': 'motor off', 'api_temperature': 300.14, 'api_pressure': 101
3, 'api_humidity': 83, 'api_weather_description': 'mist'}
Published data Successfully: %s {'temperature': 74, 'humidity': 89, 'soilmoisture': 50, 'status': 'motor off', 'api_temperature': 300.14, 'api_pressure': 10
13, 'api_humidity': 83, 'api_weather_description': 'mist'}
Published data Successfully: %s {'temperature': -1, 'humidity': 14, 'soilmoisture': 77, 'status': 'motor off', 'api_temperature': 300.14, 'api_pressure': 10
13, 'api_humidity': 83, 'api_weather_description': 'mist'}
Published data Successfully: %s {'temperature': 18, 'humidity': 66, 'soilmoisture': 81, 'status': 'motor off', 'api_temperature': 300.14, 'api_pressure': 10
13, 'api_humidity': 83, 'api_weather_description': 'mist'}
Published data Successfully: %s {'temperature': 98, 'humidity': 15, 'soilmoisture': 100, 'status': 'motor off', 'api_temperature': 300.14, 'api_pressure': 1
013, 'api_humidity': 83, 'api_weather_description': 'mist'}
Published data Successfully: %s {'temperature': -11, 'humidity': 17, 'soilmoisture': 96, 'status': 'motor off', 'api_temperature': 300.14, 'api_pressure': 1
013, 'api_humidity': 83, 'api_weather_description': 'mist'}
Published data Successfully: %s {'temperature': 102, 'humidity': 87, 'soilmoisture': 47, 'status': 'motor off', 'api_temperature': 300.14, 'api_pressure': 1
013, 'api_humidity': 83, 'api_weather_description': 'mist'}
Published data Successfully: %s {'temperature': 49, 'humidity': 57, 'soilmoisture': 47, 'status': 'motor off', 'api_temperature': 300.14, 'api_pressure': 10
13, 'api_humidity': 83, 'api_weather_description': 'mist'}
Published data Successfully: %s {'temperature': 15, 'humidity': 3, 'soilmoisture': 84, 'status': 'motor off', 'api_temperature': 300.14, 'api_pressure': 101
3, 'api_humidity': 83, 'api_weather_description': 'mist'}
Published data Successfully: %s {'temperature': 48, 'humidity': 96, 'soilmoisture': 49, 'status': 'motor off', 'api_temperature': 300.14, 'api_pressure': 10
13, 'api_humidity': 83, 'api_weather_description': 'mist'}
Published data Successfully: %s {'temperature': 103, 'humidity': 3, 'soilmoisture': 84, 'status': 'motor off', 'api_temperature': 300.14, 'api_pressure': 10
13, 'api_humidity': 83, 'api_weather_description': 'mist'}
```

NODE RED Flow Connections

- Interfacing IBM Cloud
- Intefacing & Getting Sensor Datas
- Connecting MIT App Inventor
- Weather Map Parameters



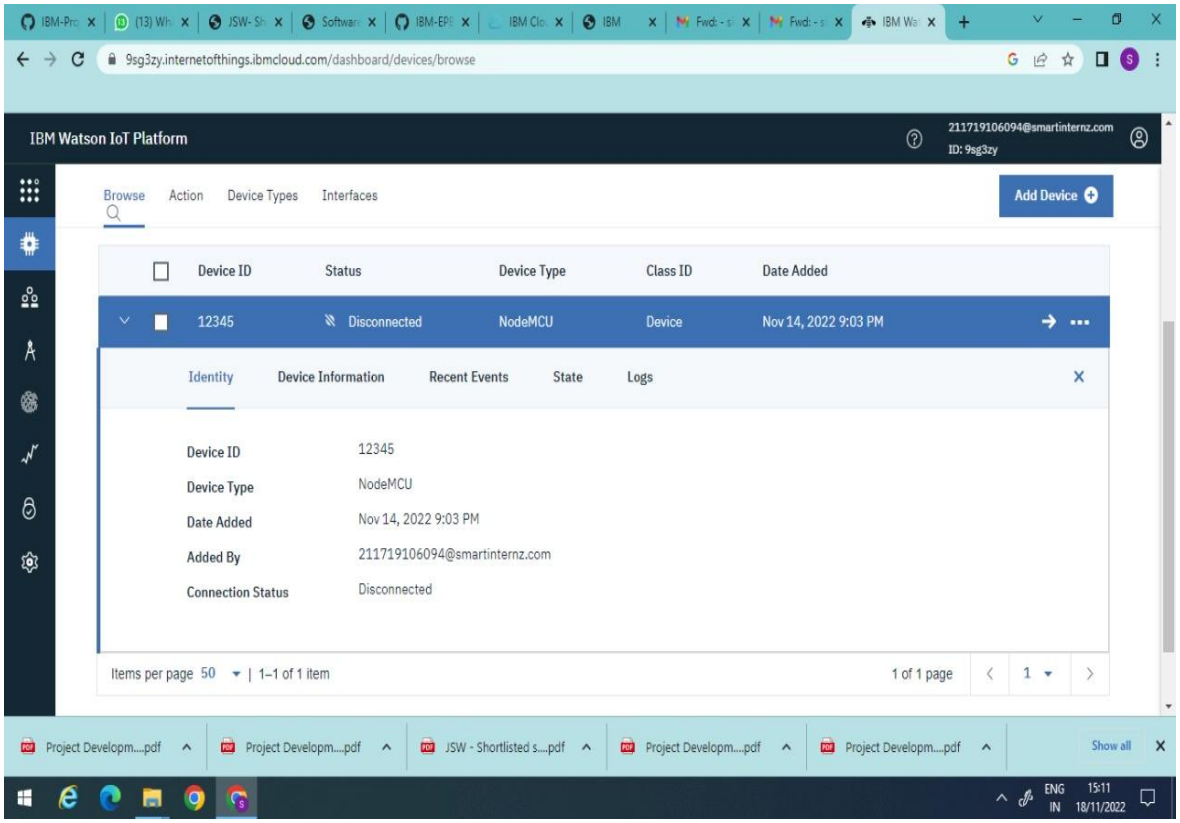
Live Publish Data Output Of Node Red



Web API Output

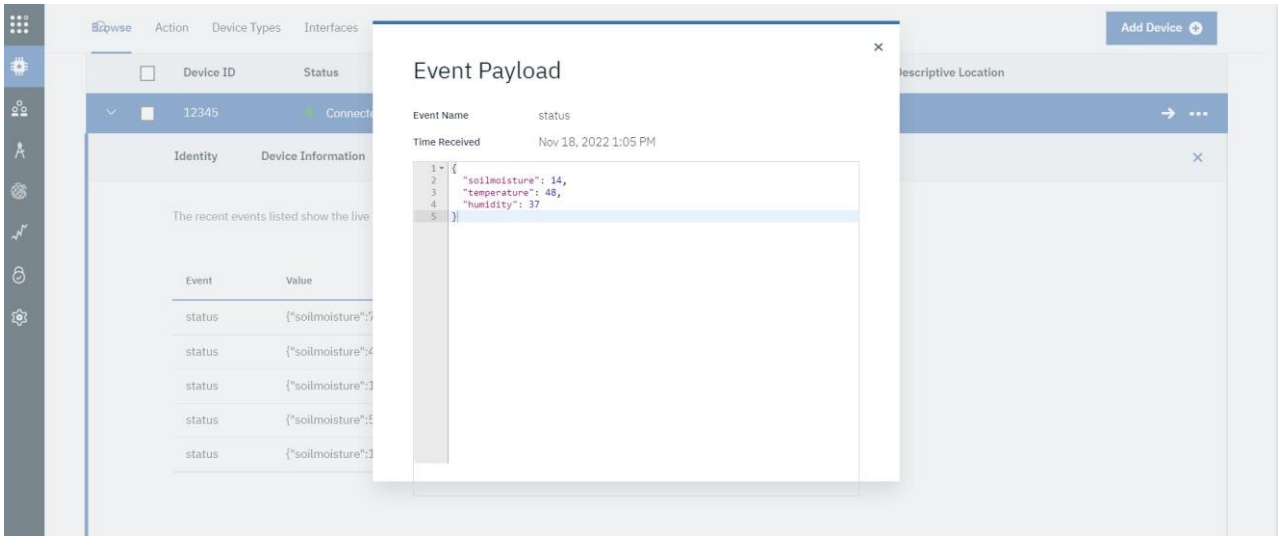
IBM Watson IoT Platform

- **Device Connected Details**



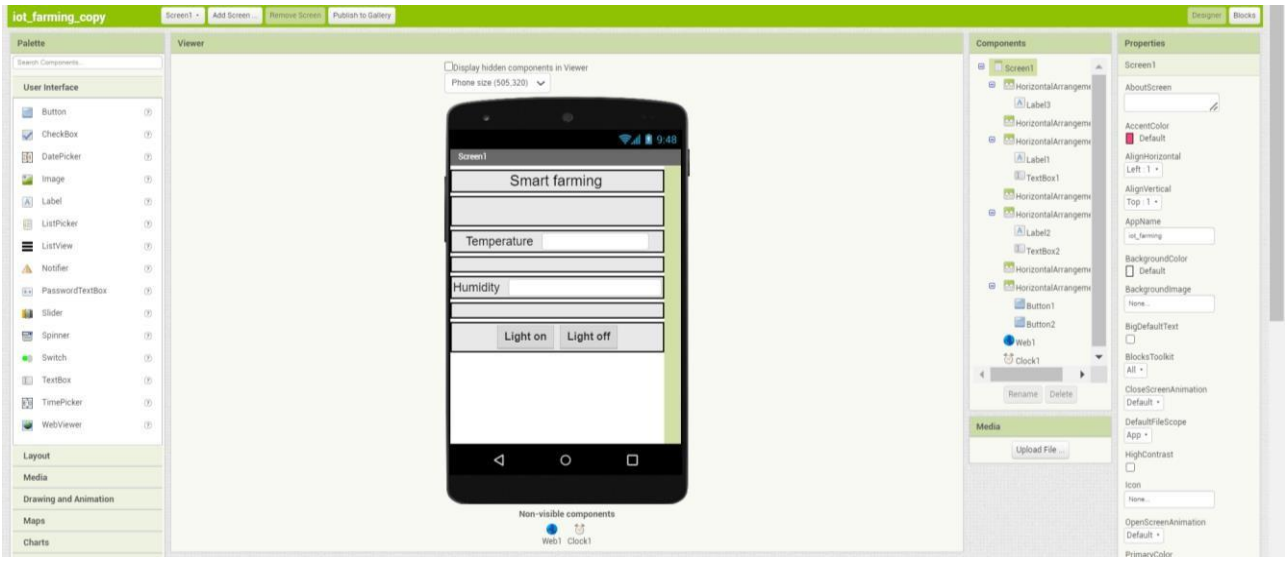
Live Date Output Of IBM Watson Iot Platform

- Sensor Output Data
- Weather Condition
- Weather Map Parameters In Current Location

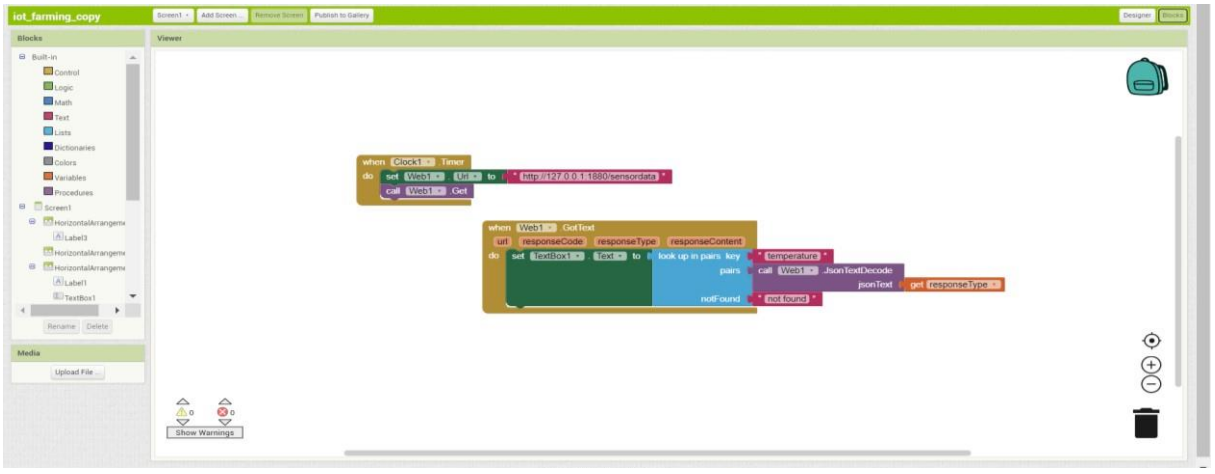


MIT APP INVENTOR

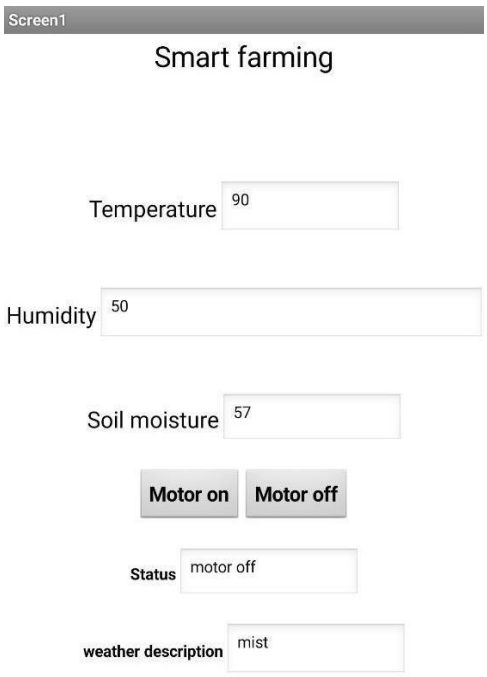
- **Design**

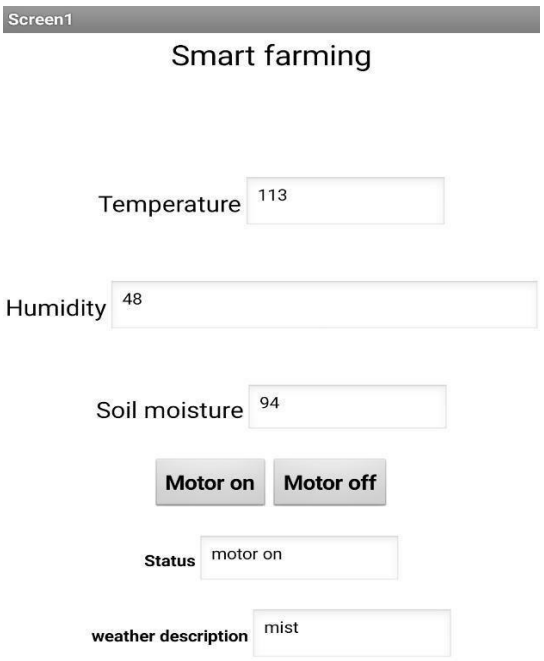


Back End Process(Block)



Mobile Application Ouput


Screen1
Smart farming
Temperature
90
Humidity
50
Soil moisture
57
Motor on
Motor off
Status
motor off
weather description
mist


Screen1
Smart farming
Temperature
113
Humidity
48
Soil moisture
94
Motor on
Motor off
Status
motor on
weather description
mist