



# Smart Animal Farm Using IoT



## **Team members**

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# Introduction

- Today the world technology has been improved a lot .
- where everything getting automated which further decreasing manual work by humans and making existence easier.
- By using this technology , our work is going to be done much more efficient and error free manner.



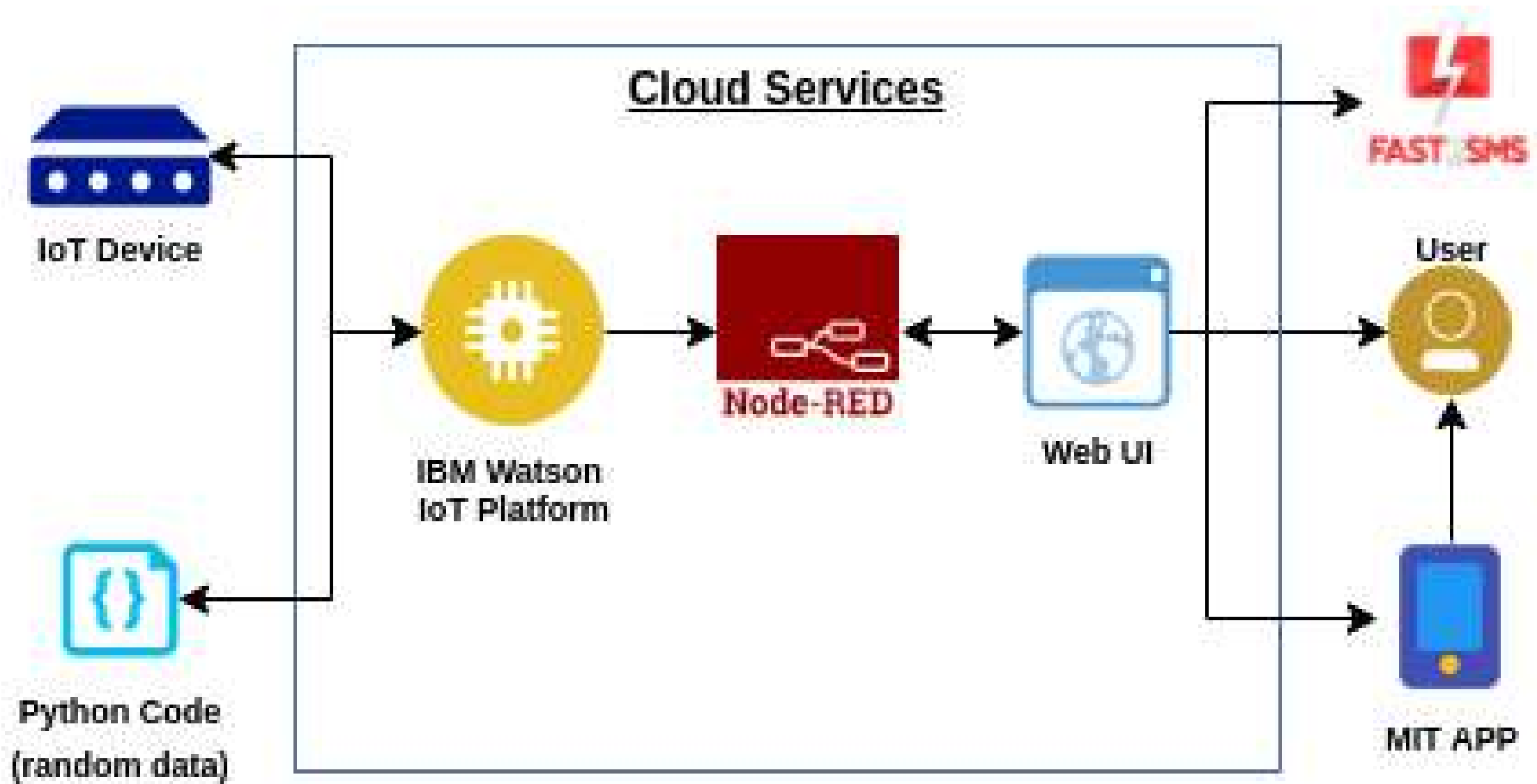
# problem statement

- Smart Animal Farm Using IoT
- Features:
- It measures various environmental parameters like temperature, humidity, ammonia gas which plays a vital role in poultry operations.
- Operators can get updates regarding the internal environmental situation of animal farms by accessing the data using a web page or mobile app.
- With the help of a mobile app or web page, we can control the water pump as per the water level in the tank for a continuous supply of water to the farm.
- With the temperature and humidity values, the exhaust and blower fans are self-regulated and can also be controlled manually.
- The lighting in the farm is also adjustable by the LEDs through Web and Mobile App.
- The flame sensor is interfaced in the farm to avoid any fire accidents.

# ADVANTAGES

- By using iot in animal form we can monitor the environment easily
- The food and water to the form is supplied in time.
- Further we can decrease the chance of fire accidents in the forms especilly in closed environment.
- we can save the electricity and water with the sensor integration in the form .

# Architecture





## Project progress steps

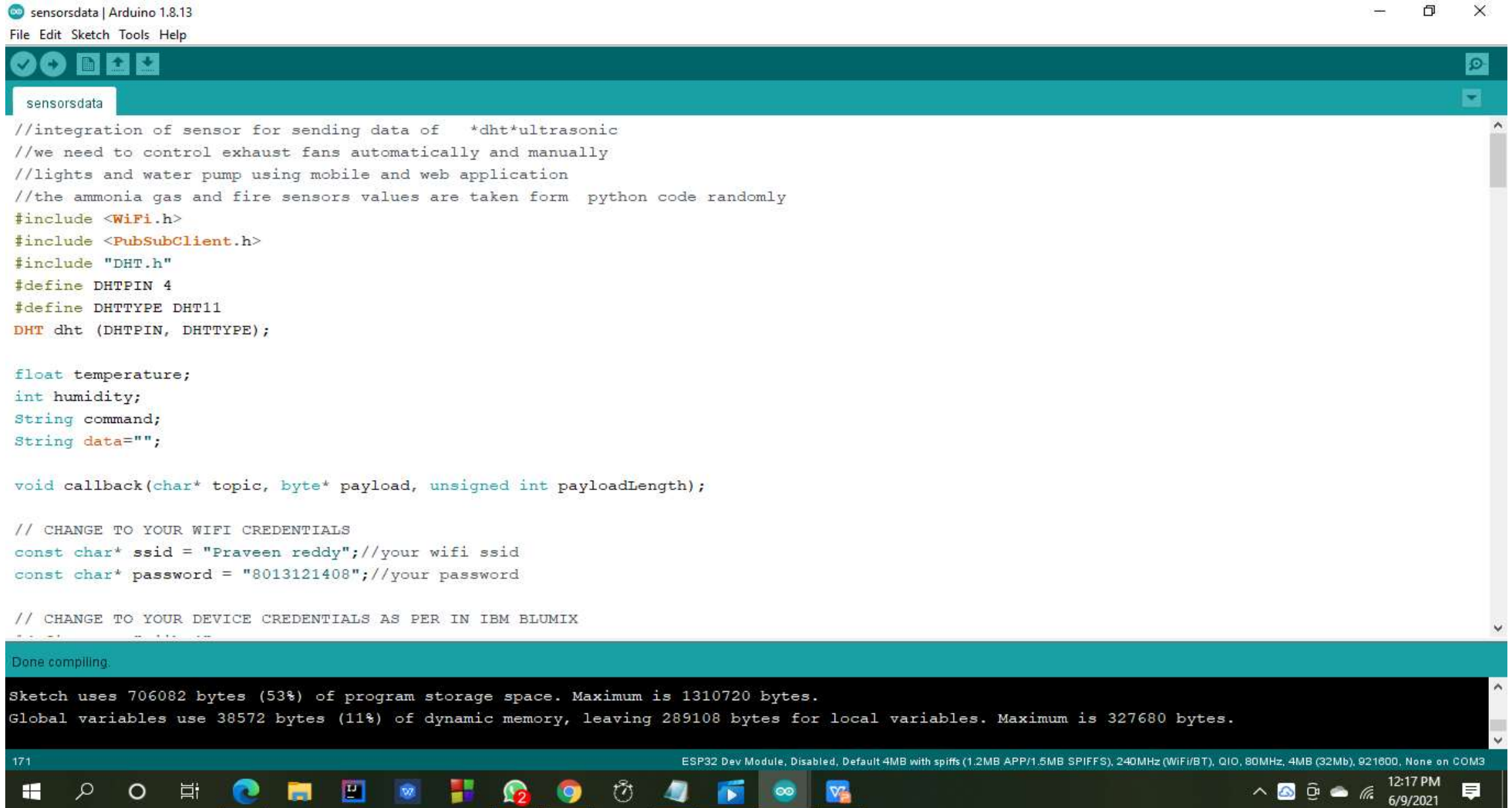
- Writing the code for esp32 to send the vlaues Temperature ,Humidity,Ultrasonic sensor values to nodered and cloudantdb
- python code for sending the random values of ammonia gas and fire .

- Designing a web ui for displaying the values and controlling the lights ,pump ,and exhaust fans in the form.

- Designing a mobile application using mit app .to display the sensor data and control the light pump and exhaust of the form.

- Making the operations automated and getting the status of the farm in web as well as mobile application
- integrating message alerts in case of fire and harmful gases.

## configuring the arduino code



```
sensorsdata | Arduino 1.8.13
File Edit Sketch Tools Help

sensorsdata

//integration of sensor for sending data of *dht*ultrasonic
//we need to control exhaust fans automatically and manually
//lights and water pump using mobile and web application
//the ammonia gas and fire sensors values are taken form python code randomly
#include <WiFi.h>
#include <PubSubClient.h>
#include "DHT.h"
#define DHTPIN 4
#define DHTTYPE DHT11
DHT dht (DHTPIN, DHTTYPE);

float temperature;
int humidity;
String command;
String data="";

void callback(char* topic, byte* payload, unsigned int payloadLength);

// CHANGE TO YOUR WIFI CREDENTIALS
const char* ssid = "Praveen reddy";//your wifi ssid
const char* password = "8013121408";//your password

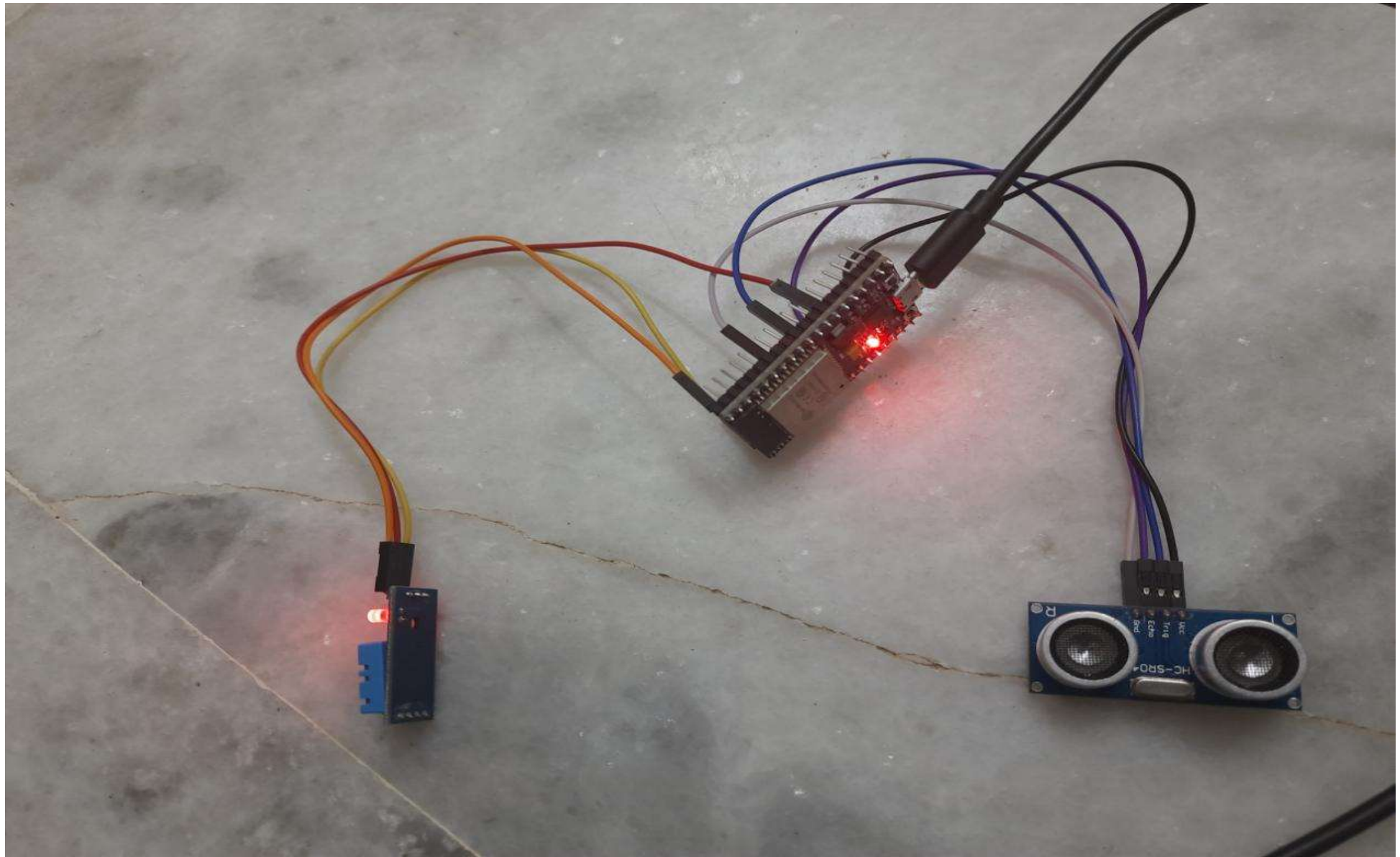
// CHANGE TO YOUR DEVICE CREDENTIALS AS PER IN IBM BLUMIX

Done compiling.

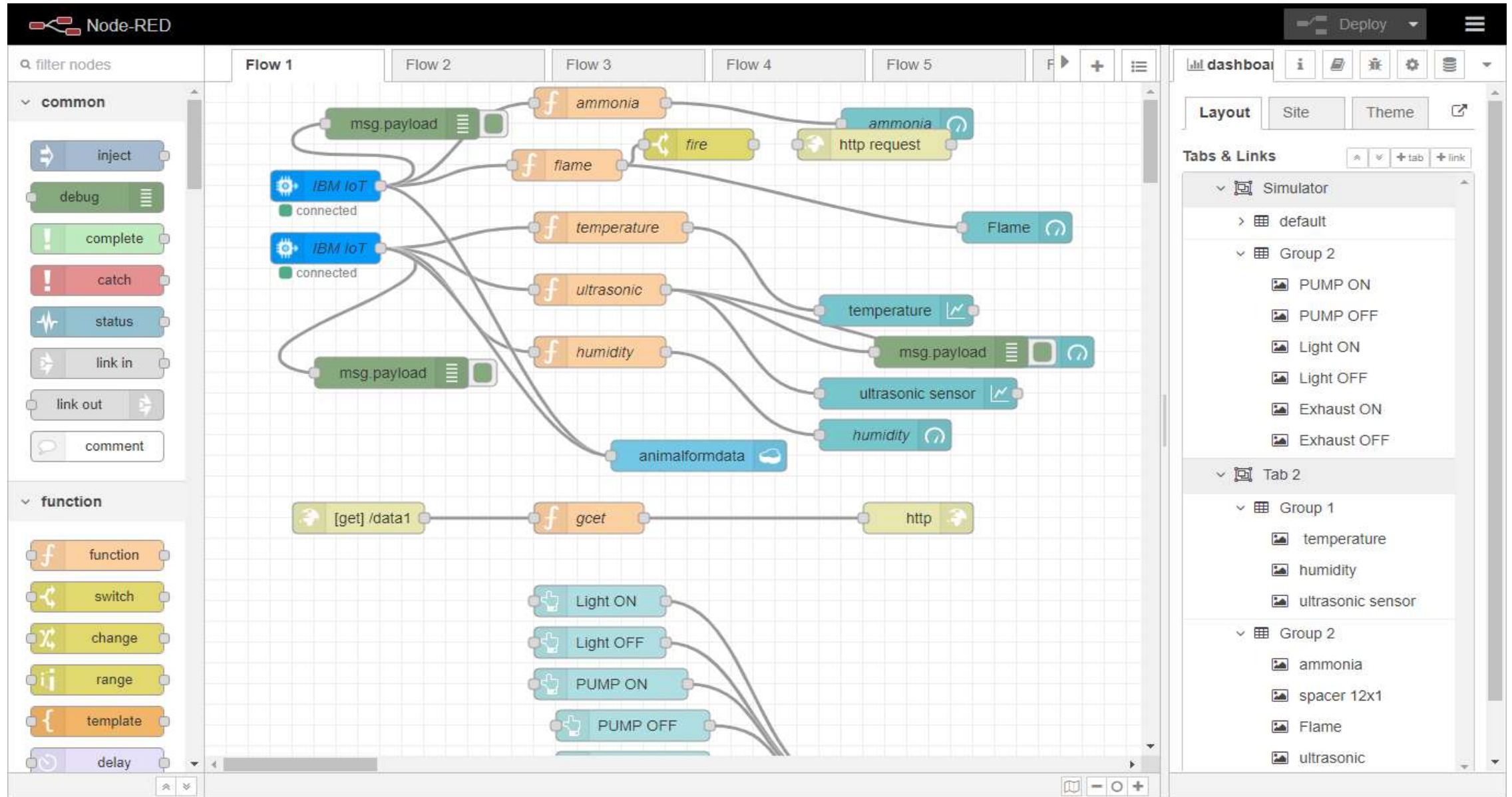
Sketch uses 706082 bytes (53%) of program storage space. Maximum is 1310720 bytes.
Global variables use 38572 bytes (11%) of dynamic memory, leaving 289108 bytes for local variables. Maximum is 327680 bytes.

171 ESP32 Dev Module, Disabled, Default 4MB with spiiffs (1.2MB APP/1.5MB SPIFFS), 240MHz (WiFi/BT), QIO, 80MHz, 4MB (32Mb), 921600, None on COM3
```

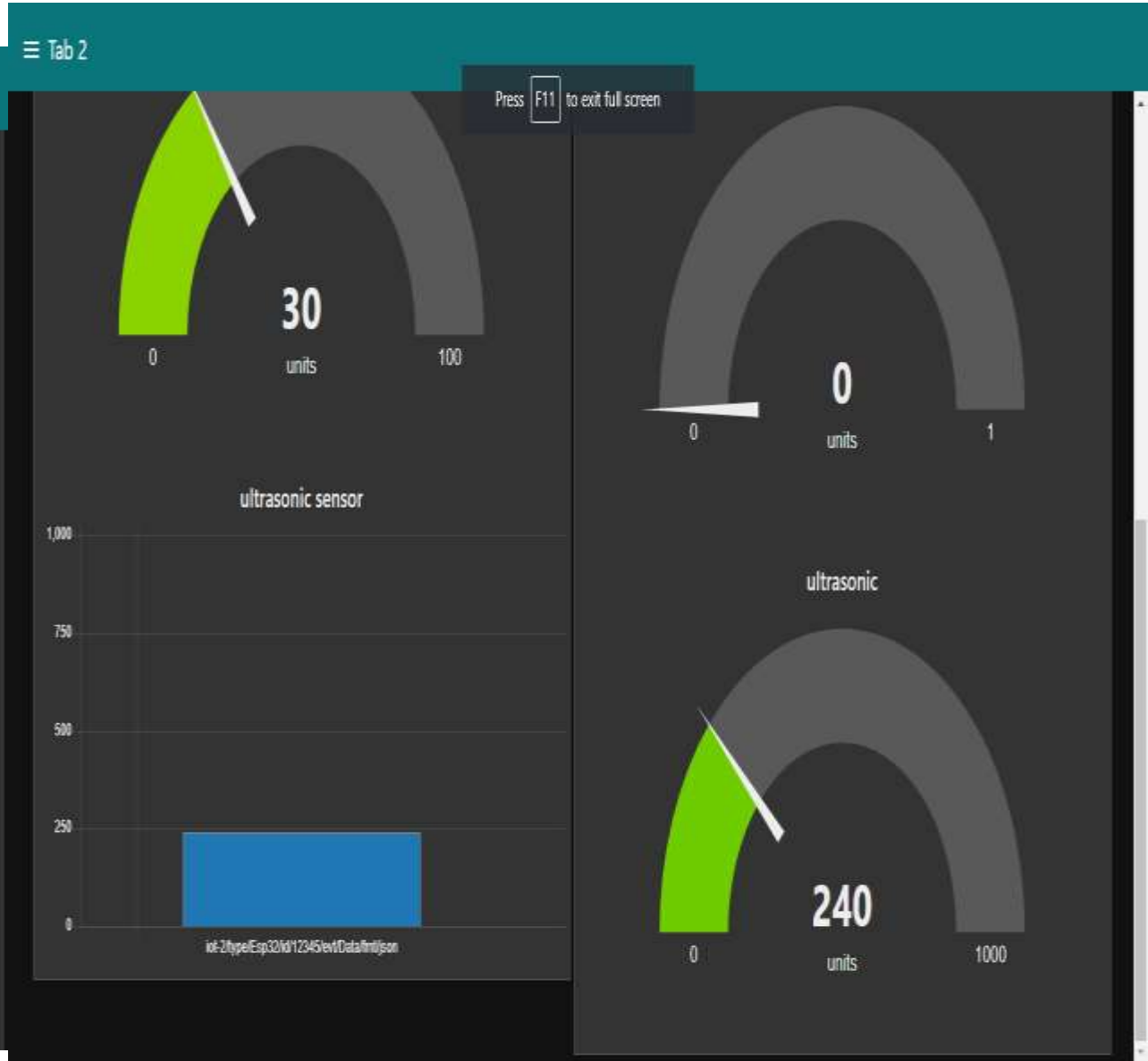




# node red application



web ui





## controlling using web ui buttons

The image shows a web-based IoT simulator interface and its connection to an Arduino IDE. The simulator, titled "Simulator", features a "Group 2" panel with six teal buttons: "PUMP ON", "PUMP OFF", "LIGHT ON", "LIGHT OFF", "EXHAUST ON", and "EXHAUST OFF". The background of the simulator is dark grey.

Overlaid on the simulator is the Arduino IDE window, titled "sensorsdata | Arduino 1.8.13". The "Serial Monitor" tab is active, displaying the following log output from the Arduino:

```
Publish OK
callback invoked for topic: iot-2/cmd/home/fmt/String
data: pumpoff
Sending payload: {"d":{"temperature":52.00,"humidity":31,"distance":265}}
Publish OK
callback invoked for topic: iot-2/cmd/home/fmt/String
data: lighton.....lights are on.....

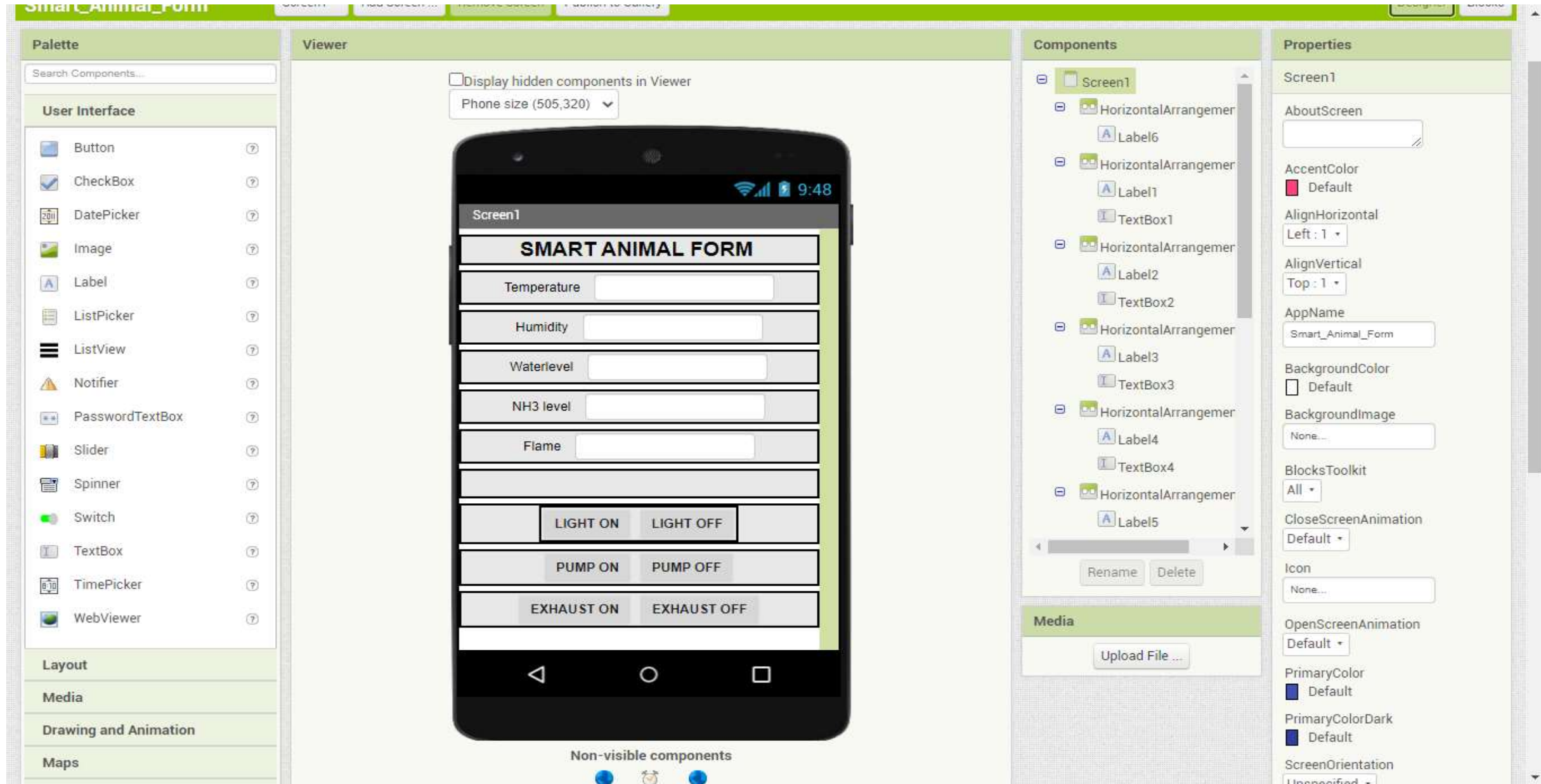
Sending payload: {"d":{"temperature":52.00,"humidity":31,"distance":268}}
Publish OK
callback invoked for topic: iot-2/cmd/home/fmt/String
data: lightoff.....lights are off.....

Sending payload: {"d":{"temperature":52.00,"humidity":31,"distance":267}}
Publish OK
```

At the bottom of the IDE window, a status bar indicates: "Sketch uses 706082 bytes (53%) of program storage space. Maximum is 1310720 bytes. Global variables use 38572 bytes (11%) of dynamic memory, leaving 28912 bytes free. 240MHz (WiFi/BT), QIO, 80MHz, 4MB (32Mb), 921600, None on COM3".

The bottom of the image shows a Windows taskbar with various application icons and a system clock indicating 12:31 PM on 6/9/2021.

# mobile application



# code part of mit app

**MIT APP INVENTOR**

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**Smart\_Animal\_Form** Screen1 ▾ Add Screen ... Remove Screen Publish to Gallery Designer Blocks

**Blocks**

- Built-in
  - Control
  - Logic
  - Math
  - Text
  - Lists
  - Dictionaries
  - Colors
  - Variables
  - Procedures
- Screen1
  - HorizontalArranger
    - Label6
  - HorizontalArranger
    - Label1
    - TextBox1
  - HorizontalArranger

Rename Delete

**Media**

Upload File ...

**Viewer**

call Web1 .Get

when Web1 .GoText

- url responseCode responseType responseContent
- do
  - set TextBox1 .Text to look up in pairs key "temperature" pairs call Web1 .JsonTextDecode jsonText get responseContent
  - notFound "not found"
  - set TextBox2 .Text to look up in pairs key "humidity" pairs call Web1 .JsonTextDecode jsonText get responseContent
  - notFound "not found"
  - set TextBox3 .Text to look up in pairs key "ultrasonic" pairs call Web1 .JsonTextDecode jsonText get responseContent
  - notFound "not found"
  - set TextBox4 .Text to look up in pairs key "ammonia" pairs call Web1 .JsonTextDecode jsonText get responseContent
  - notFound "not found"
  - set TextBox5 .Text to look up in pairs key "flame" pairs call Web1 .JsonTextDecode jsonText get responseContent
  - notFound "not found"

when Button1 .Click

- do
  - set Web2 .Url to "https://hemanth31.eu-gb.mybluemix.net/command?co..."
  - call Web2 .Get
- do
  - set Web2 .Url to "https://hemanth31.eu-gb.mybluemix.net/command?co..."
  - call Web2 .Get

0 0

Show Warnings

Privacy Policy and Terms of Use



## Smart\_Animal\_Form

Screen1 ▾ Add Screen ... Remove Screen Publish to Gallery

Designer Blocks

## Blocks

## Built-in

- Control
- Logic
- Math
- Text
- Lists
- Dictionaries
- Colors
- Variables
- Procedures

## Screen1

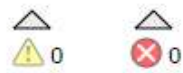
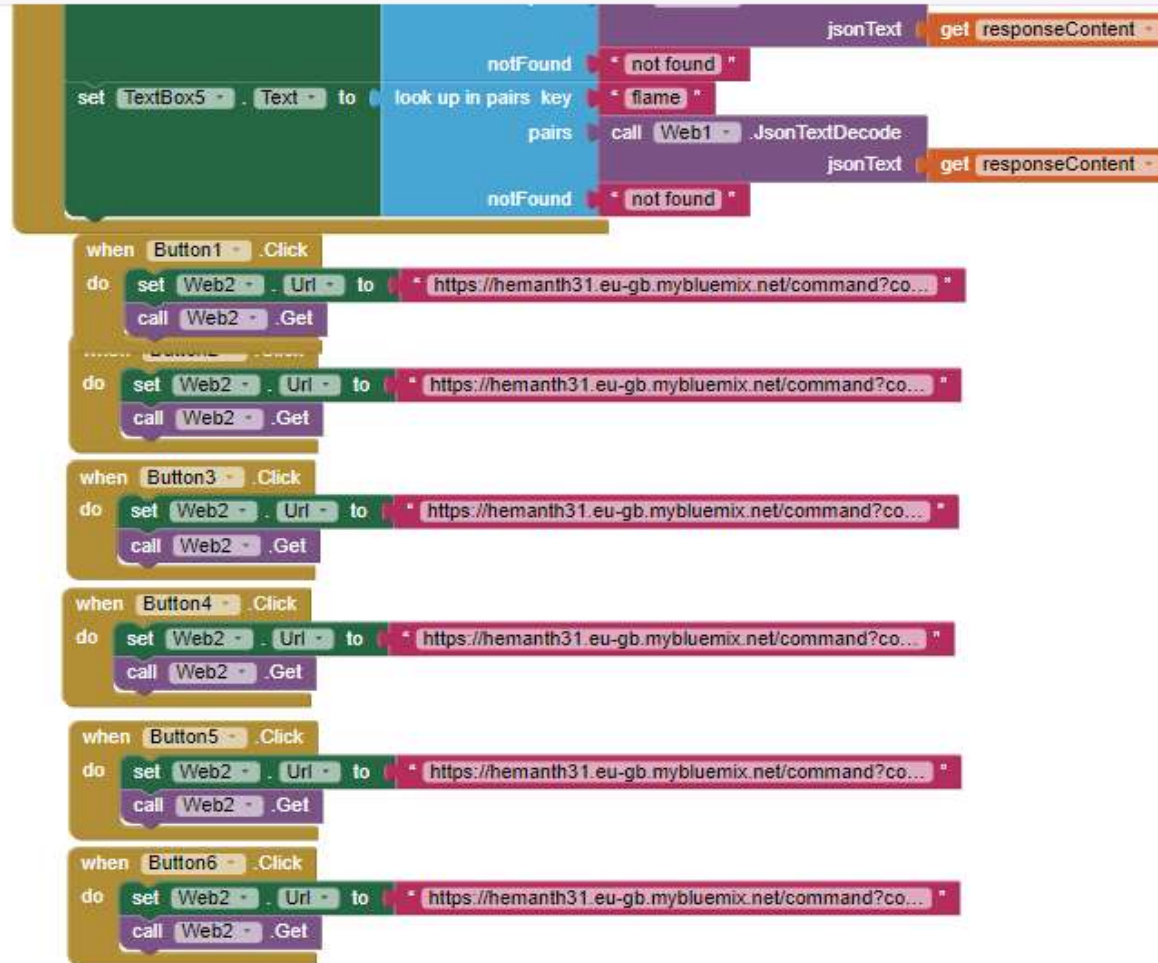
- HorizontalArranger
- Label6
- HorizontalArranger
- Label1
- TextBox1
- HorizontalArranger

Rename Delete

## Media

Upload File ...

## Viewer



Show Warnings



11:02 35%

Screen1

## SMART ANIMAL FORM

Temperature

55

Humidity

30

Waterlevel

241

NH3 level

90

Flame

1

LIGHT ON

LIGHT OFF

PUMP ON

PUMP OFF

EXHAUST ON

EXHAUST OFF

III O <

displaying the data in the mobile.



fast 2 sms

The screenshot shows the Fast2SMS Developer API dashboard. The top navigation bar includes the Fast2SMS logo, a link to 'How Developer API Works', 'Account Info', the current time '10:52:56 AM', and the user name 'Hemanth re...'. A sidebar on the left contains a balance of ₹46.00 and an 'ADD CREDIT' button, along with menu items: Bulk SMS, DLT SMS, Quick SMS, Address Book, Delivery Reports, Transactions, Dev API (selected), Settings, and Help.

The main content area has three tabs: 'Dev API', 'API Key', and 'Security'. The 'Dev API' tab is active, showing the following configuration:

- Method:** GET
- Route:** Quick SMS
- Message (NOTE: Per SMS cost ₹ 1.50):** fire alert!....
- Language:** English (selected), Unicode

A dark overlay box on the right displays the generated API call details:

```
GET https://www.fast2sms.com/dev/bulkV2

Query Parameter :

authorization =
XUCB203aYTW1G8NlxtQR9ozKhSyVcwM6EfnJdru754ljDP
0pmFgQtSpqRxZPJikv6k0AUHMOEaX35Fzm

route = q

message = fire alert!....

language = "english"

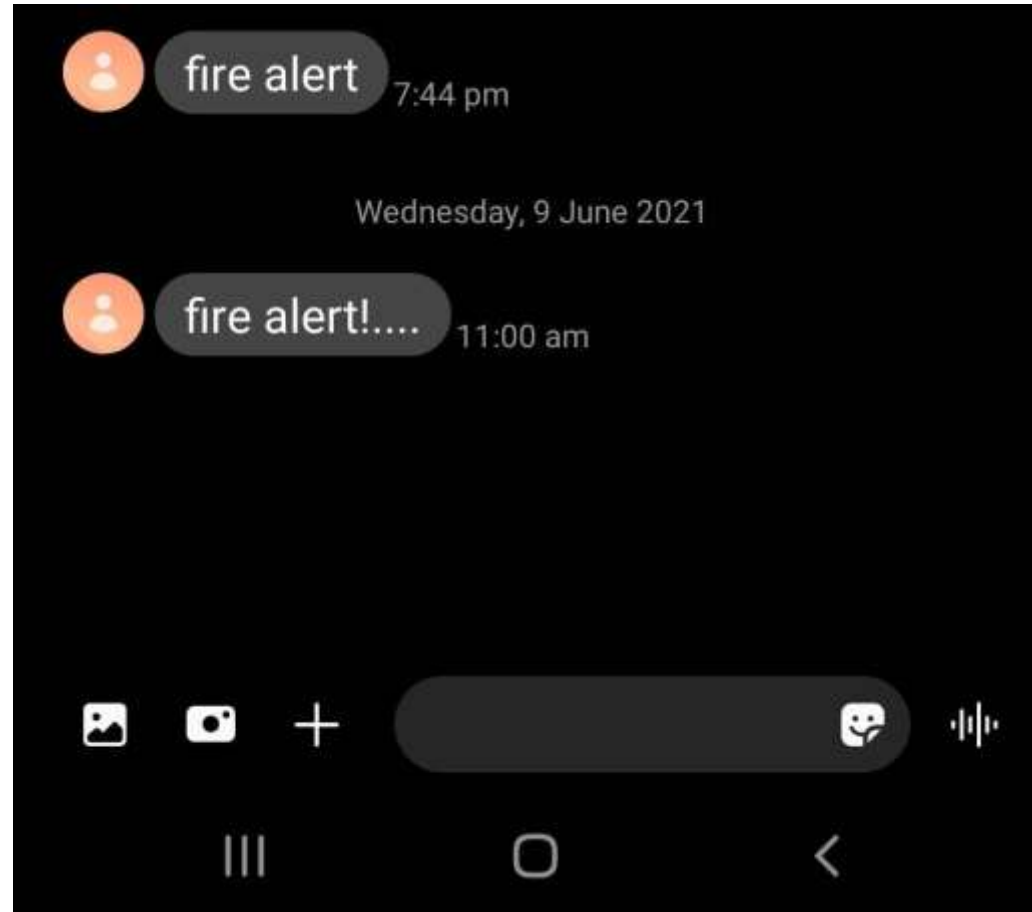
numbers = 8885434340

flash = "0"

Overall URL = https://www.fast2sms.com/dev/bulkV2?
authorization=XUCB203aYTW1G8NlxtQR9ozKhSyVcwM6E
fnJdru754ljDP0pmFgQtSpqRxZPJikv6k0AUHMOEaX35Fz
m&route=q&message=fire%20alert!....&language=english&f
lash=0&numbers=8885434340
```

The Windows taskbar at the bottom shows the system clock as 10:52 AM on 6/9/2021.

# fast to sms



Databases Database name Create Database {}JSON

Your Databases

Name	Size	# of Docs	Partitioned	Actions
animalformdata	12.2 KB	11	No	
gcet	2.7 KB	2	No	
gctc	6.8 KB	4	No	
hemanth	151.5 KB	4	No	

Showing 1–4 of 4 databases. Databases per page 20 1

# cloudant db

Log Out

animalformdata

All Documents

Query

Permissions

Changes

Design Documents

Document ID

Options

JSON

Table

Metadata

JSON

Create Document

	id	key	value
<input type="checkbox"/>	01bc046621c08f56fc60c1aebe3b2e...	01bc046621c08f56fc60c1aebe3b2e...	{"rev": "1-c7c32ef44ef63aec0557b3..."}
<input type="checkbox"/>	01bc046621c08f56fc60c1aebe3b41...	01bc046621c08f56fc60c1aebe3b41...	{"rev": "1-7d66b750a6dfdc28314d7..."}
<input type="checkbox"/>	01bc046621c08f56fc60c1aebe3b51...	01bc046621c08f56fc60c1aebe3b51...	{"rev": "1-379c818df37fe7f29488fe..."}
<input type="checkbox"/>	01bc046621c08f56fc60c1aebe3b86...	01bc046621c08f56fc60c1aebe3b86...	{"rev": "1-dc1534cf3f2135bb8abf18..."}
<input type="checkbox"/>	01bc046621c08f56fc60c1aebe3ba2...	01bc046621c08f56fc60c1aebe3ba2...	{"rev": "1-da2854dfa1f20d50bc9c0..."}
<input type="checkbox"/>	01bc046621c08f56fc60c1aebe3bb2...	01bc046621c08f56fc60c1aebe3bb2...	{"rev": "1-c0a8b4042b66ceacb83e2..."}
<input type="checkbox"/>	01bc046621c08f56fc60c1aebe3bb6...	01bc046621c08f56fc60c1aebe3bb6...	{"rev": "1-1ca223e53910ac889ba8c..."}
<input type="checkbox"/>	01bc046621c08f56fc60c1aebe3be7...	01bc046621c08f56fc60c1aebe3be7...	{"rev": "1-76a8573c96932a8ed11d..."}
<input type="checkbox"/>	01bc046621c08f56fc60c1aebe3bf18e	01bc046621c08f56fc60c1aebe3bf18e	{"rev": "1-c0a8b4042b66ceacb83e2..."}
<input type="checkbox"/>	01bc046621c08f56fc60c1aebe3c11...	01bc046621c08f56fc60c1aebe3c11...	{"rev": "1-21129ed5f7be47354803..."}
<input type="checkbox"/>	01bc046621c08f56fc60c1aebe3c25...	01bc046621c08f56fc60c1aebe3c25...	{"rev": "1-76ae71ee161e18001813..."}
<input type="checkbox"/>	01bc046621c08f56fc60c1aebe3c33...	01bc046621c08f56fc60c1aebe3c33...	{"rev": "1-5f5b5cd621af71ca7138fb..."}
<input type="checkbox"/>	01bc046621c08f56fc60c1aebe3c3a...	01bc046621c08f56fc60c1aebe3c3a...	{"rev": "1-b557db04d1c534da9ebc..."}
<input type="checkbox"/>	01bc046621c08f56fc60c1aebe3c65...	01bc046621c08f56fc60c1aebe3c65...	{"rev": "1-8bc58cc35f6d15531d5ad..."}

Showing document 1 - 20. Documents per page: 20



✓ Save Changes

Cancel

⬆ Upload Attachment

🔄 Clone Document

🗑 Delete

```
1 {
2   "_id": "01bc046621c08f56fc60c1aebe3bb2c4",
3   "_rev": "1-c0a8b4042b66ceacb83e27c3e3b327d0",
4   "topic": "iot-2/type/Esp32/id/12345/evt/Data/fmt/json",
5   "payload": {
6     "d": {
7       "temperature": 56,
8       "humidity": 30,
9       "distance": 179
10    }
11  },
12  "deviceId": "12345",
13  "deviceType": "Esp32",
14  "eventType": "Data",
15  "format": "json"
16 }
```



Log Out

Thank you