

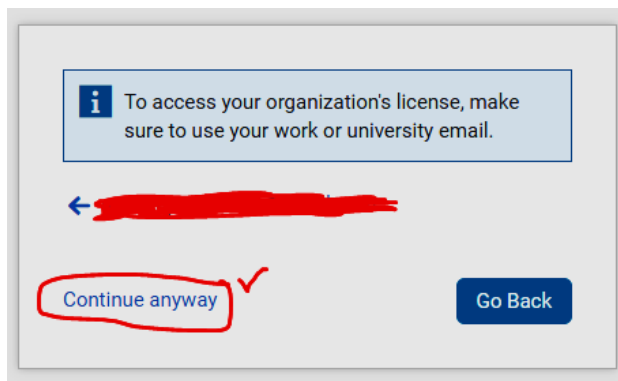
Exp-4: Using ESP32 on Wokwi simulator for Streaming IoT sensor data to ThingSpeak cloud.

Step-1: Creating a new account on ThingSpeak cloud.

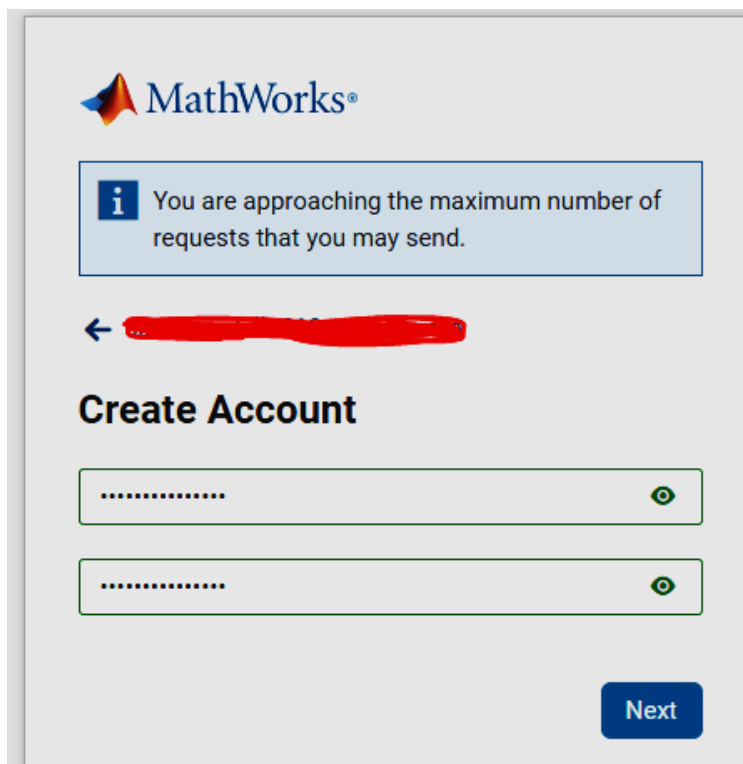
Visit <https://thingspeak.com/login?skipSSOCheck=true> and create a new account by using your email address. An activation link would be sent on your email id, open that email and verify the email address.

Then, go to <https://in.mathworks.com/mwaccount/account/create?uri=> and use the same email to create an account.

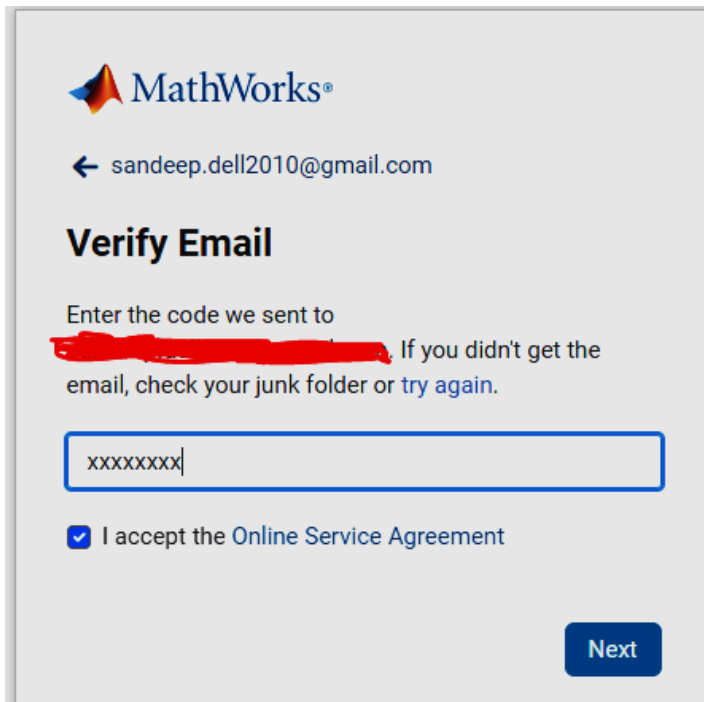
Click on '**continue anyway**' as shown in snap below:



Then, it will ask for **creating the password** as shown in snap below:

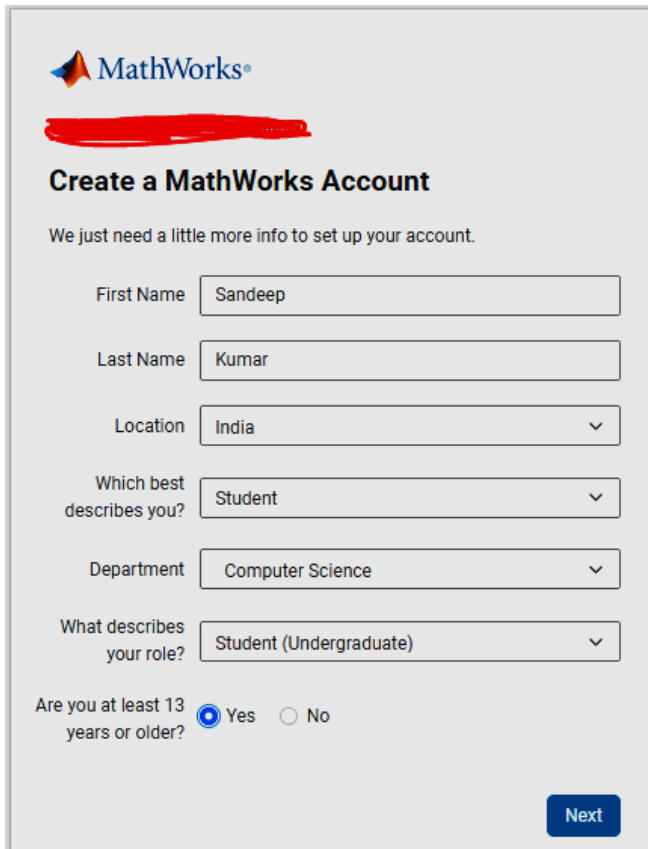


A 'code word' would be sent to your email address. Fill that code and click on next as shown in snap below:



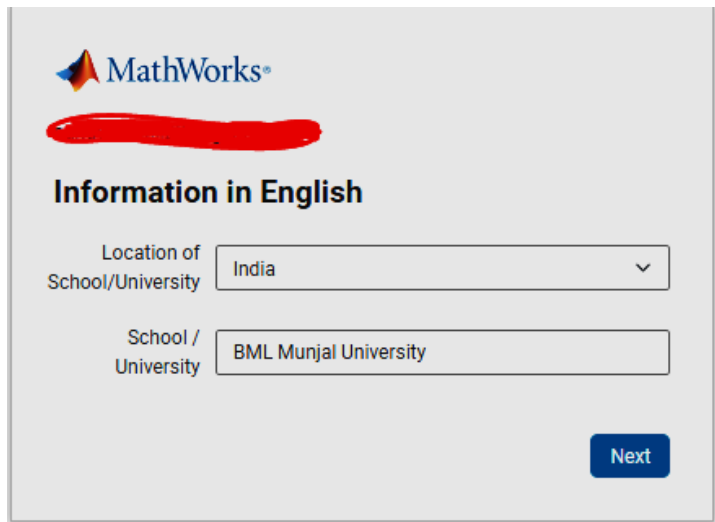
The screenshot shows the MathWorks 'Verify Email' page. At the top is the MathWorks logo. Below it is a back arrow and the email address 'sandeep.dell2010@gmail.com'. The heading 'Verify Email' is followed by the instruction 'Enter the code we sent to' and a redacted email address. A link says 'If you didn't get the email, check your junk folder or try again.' There is a text input field containing 'xxxxxxx'. Below the field is a checked checkbox for 'I accept the Online Service Agreement'. A blue 'Next' button is at the bottom right.

Then fill-in the requisite details and click on next as shown in snap below:



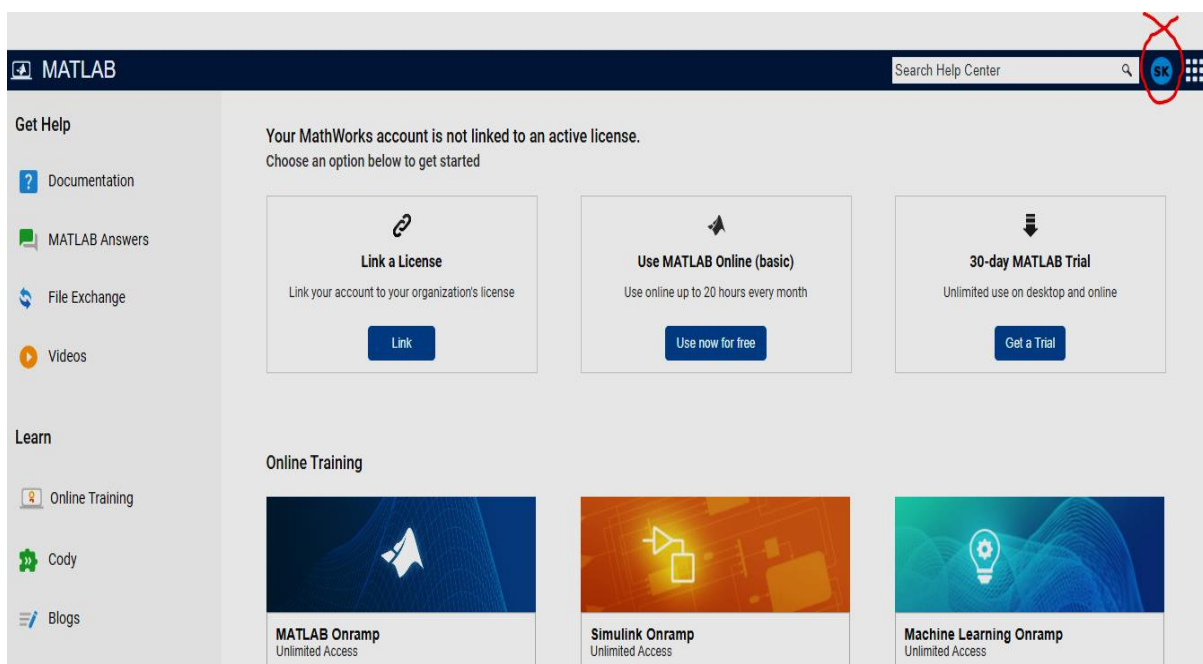
The screenshot shows the MathWorks 'Create a MathWorks Account' page. At the top is the MathWorks logo and a redacted email address. The heading 'Create a MathWorks Account' is followed by the instruction 'We just need a little more info to set up your account.' There are several form fields: 'First Name' (Sandeep), 'Last Name' (Kumar), 'Location' (India), 'Which best describes you?' (Student), 'Department' (Computer Science), and 'What describes your role?' (Student (Undergraduate)). At the bottom, there is a question 'Are you at least 13 years or older?' with 'Yes' selected. A blue 'Next' button is at the bottom right.

Then fill-in the university info and click on next (see snap below):



The image shows the MathWorks account setup page. At the top is the MathWorks logo. Below it is a redacted area. The section is titled "Information in English". There are two input fields: "Location of School/University" with a dropdown menu showing "India", and "School / University" with a text input field containing "BML Munjal University". A blue "Next" button is at the bottom right.

Finally, your account would be created and you will see the main screen of mathworks MATLAB as shown below:



Step-2: Logging in to the ThingSpeak cloud.

Visit <https://thingspeak.com/login?skipSSOCheck=true> and use the registered email id (used in step-1). Then, fill-in the password (created in step-2) and click on sign-in. You will see the window asking for 'Usage intent'. Fill-in the requisite info and click on OK as shown in the snap below:

The screenshot shows the 'ThingSpeak Usage Intent' form. It includes the following fields and options:

- How are you using ThingSpeak?***
 - ☐ Commercial work (including research)
 - ☐ Government work (including research)
 - ☐ Personal, non-commercial projects
 - ☒ Student use, Teaching, or Research in academia
- What is the name of your University?***
BML Munjal University
- What best describes your current role?***
 - ☒ Student
 - ☐ Professor
 - ☐ Researcher
- What is the name of your Course or Project?***
IoT
- Tell us something about your project (optional)**
[Empty text area]

An 'OK' button is at the bottom right of the form.

Step-3: On the main screen, click on click on channels → My channels → New channel.

The screenshot shows the 'My Channels' page. It features a 'New Channel' button and a 'Search by tag' input field with a search icon.

Step-4: Fill-in the following details, scroll down and click on save as shown the two snaps below:

The screenshot shows the 'New Channel' form with the following details:

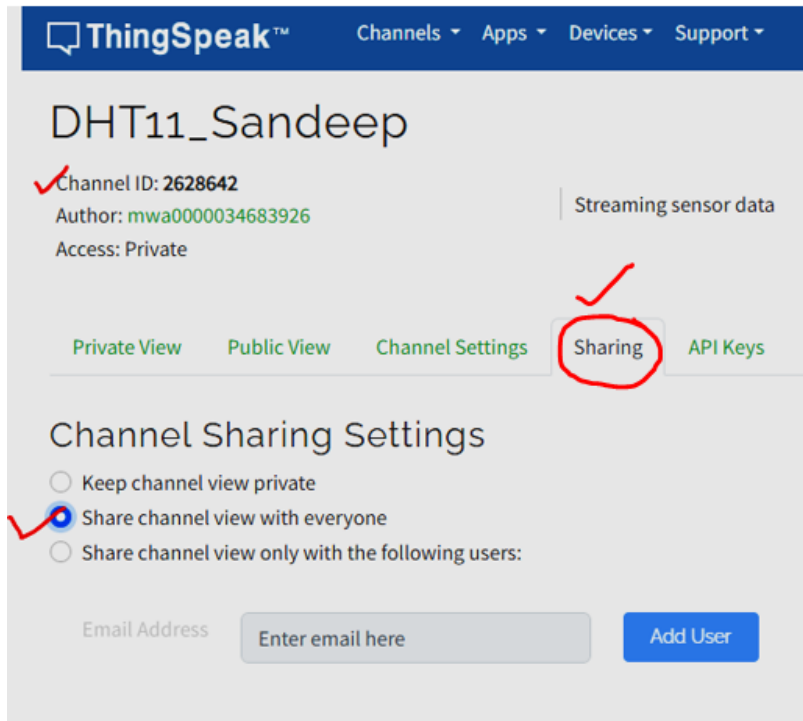
- Name:** DHT11_Sandeep
- Description:** Streaming sensor data
- Field 1:** Humidity (checked)
- Field 2:** Temperature (checked)

The screenshot shows the bottom part of the 'New Channel' form:

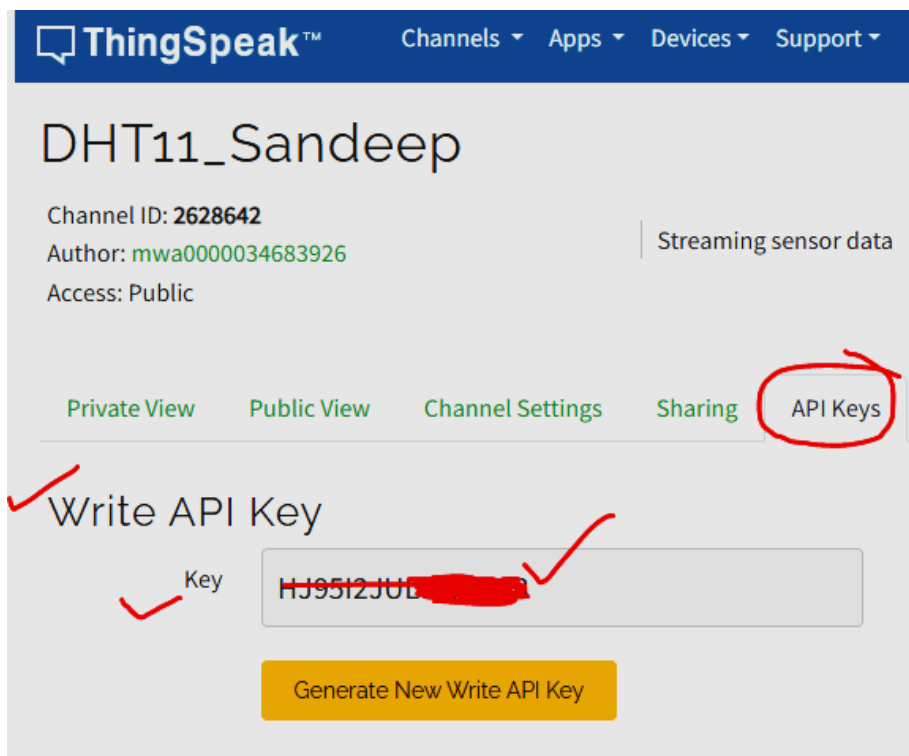
- Video URL:** http://
- Show Status:** ☐
- Save Channel:** [Green button]

You will be directed to the main screen.

Step-5: There click on 'sharing' and select '**share channel to everyone**' as shown below. *Also note down your **channel ID** which will be used to see your sensor data on a Mobile App in further steps to come.*



Step-6: Then click on the '**API keys**' and note down the '**write API key**' (to be used in code/program in coming step) as shown below:



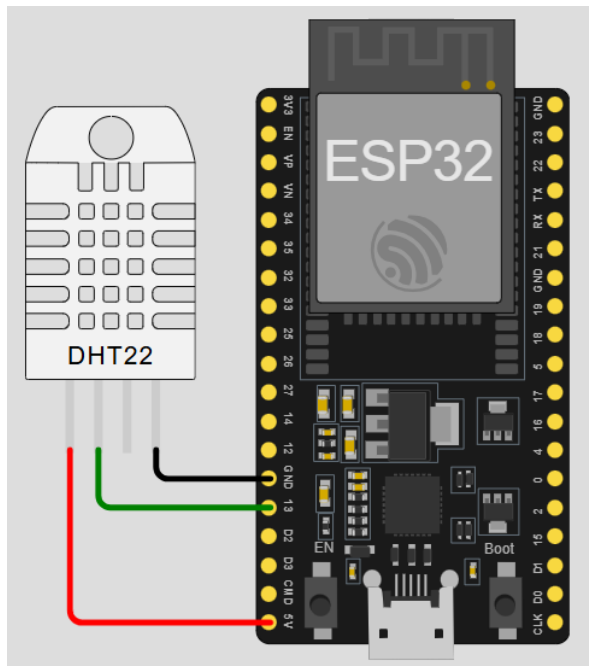
Step-7 Login to online **Wokwi Simulator** (<https://wokwi.com/>) with BMU email ID and write the following program under 'sketch.ino':

```
#include <WiFi.h>
#include "DHTesp.h"
#include "ThingSpeak.h"
const int DHT_PIN = 13;
const char* WIFI_NAME = "Wokwi-GUEST";
const char* WIFI_PASSWORD = "";
const int myChannelNumber = 2589918 ; // REPLACE WITH Your ThingSpeak CHANNEL ID
const char* myApiKey = "VCZY6VJ5JIVX5QUZ"; // REPLACE WITH Your ThingSpeak API KEY
const char* server = "api.thingspeak.com";
DHTesp dhtSensor;
WiFiClient client;

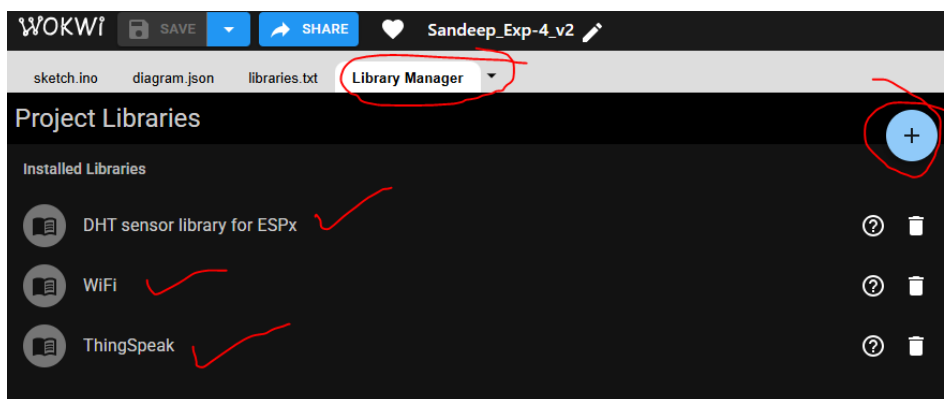
void setup()
{
    Serial.begin(115200);
    dhtSensor.setup(DHT_PIN, DHTesp::DHT22);
    WiFi.begin(WIFI_NAME, WIFI_PASSWORD);
    while (WiFi.status() != WL_CONNECTED)
    {
        delay(1000);
        Serial.println("Wifi not connected");
    }
    Serial.println("Wifi connected !");
    Serial.println("Local IP: " + String(WiFi.localIP()));
    WiFi.mode(WIFI_STA);
    ThingSpeak.begin(client);
}

void loop()
{
    TempAndHumidity data = dhtSensor.getTempAndHumidity();
    ThingSpeak.setField(1,data.humidity);
    ThingSpeak.setField(2,data.temperature);
    int x = ThingSpeak.writeFields(myChannelNumber,myApiKey);
    Serial.println("Temp: " + String(data.temperature, 2) + "°C");
    Serial.println("Humidity: " + String(data.humidity, 1) + "%");
    if(x == 200)
    {
        Serial.println("Data pushed successfull");
    }
    else
    {
        Serial.println("Push error" + String(x));
    }
    Serial.println("---");
    delay(10000);
}
```

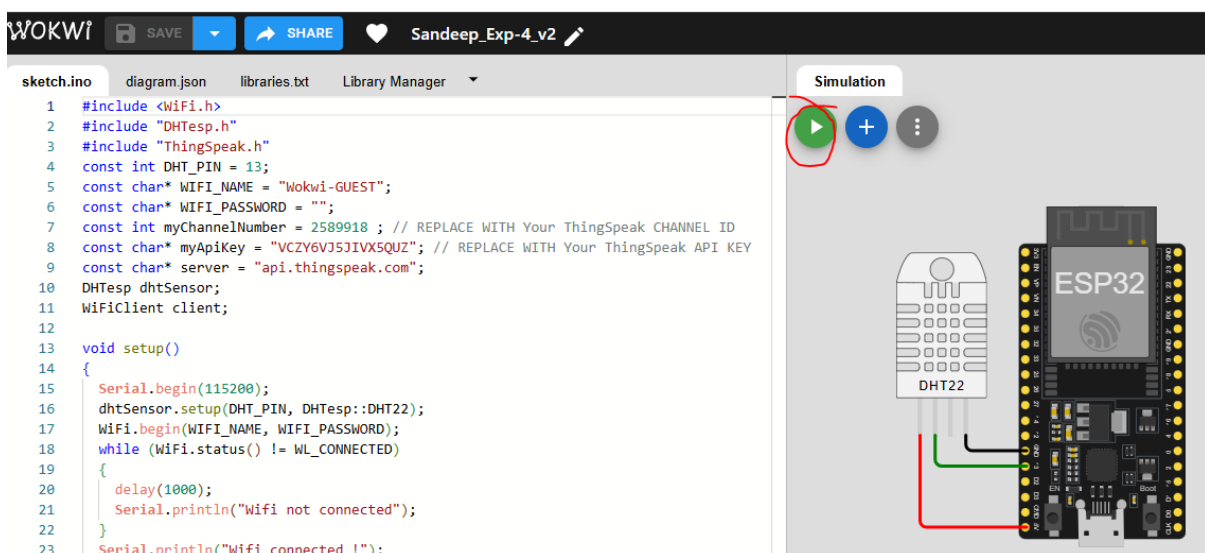
Step-8 Design the following circuit on the **Wokwi** simulator:



Step-9 Include the following **libraries** (see in the snap below)



Step-10 Save your design and **Simulate** it. [It may take a few minutes. If fails repeatedly, refresh the browser.]



ThingSpeak™

Channels ▾

Apps ▾

Devices ▾

Support ▾

Commercial Use

How to Buy

SK

Channel Stats

Created: [a day ago](#)

Last entry: [less than a minute ago](#)

Entries: 19

Field 1 Chart

DHT11_Sandeep

Date	Humidity
20:34:00	77.0
20:34:10	79.0
20:34:20	79.0
20:34:30	79.0
20:34:40	79.0
20:34:50	80.0
20:35:00	80.0
20:35:10	80.0
20:35:20	80.0
20:35:30	80.0
20:35:40	80.0
20:35:50	79.0
20:36:00	79.0
20:36:10	80.0
20:36:20	80.0
20:36:30	80.0
20:36:40	80.0
20:36:50	80.0
20:37:00	80.0
20:37:10	80.0
20:37:20	80.0
20:37:30	80.0
20:37:40	80.0
20:37:50	80.0
20:38:00	80.0
20:38:10	80.0
20:38:20	80.0
20:38:30	80.0
20:38:40	80.0
20:38:50	80.0
20:39:00	80.0
20:39:10	80.0
20:39:20	80.0
20:39:30	80.0
20:39:40	80.0
20:39:50	80.0
20:40:00	80.0
20:40:10	80.0
20:40:20	80.0
20:40:30	80.0
20:40:40	80.0
20:40:50	80.0
20:41:00	80.0
20:41:10	80.0
20:41:20	80.0
20:41:30	80.0
20:41:40	80.0
20:41:50	80.0
20:42:00	80.0
20:42:10	80.0
20:42:20	80.0
20:42:30	80.0
20:42:40	80.0
20:42:50	80.0
20:43:00	80.0
20:43:10	80.0
20:43:20	80.0
20:43:30	80.0
20:43:40	80.0
20:43:50	80.0
20:44:00	80.0
20:44:10	80.0
20:44:20	80.0
20:44:30	80.0
20:44:40	80.0
20:44:50	80.0
20:45:00	80.0
20:45:10	80.0
20:45:20	80.0
20:45:30	80.0
20:45:40	80.0
20:45:50	80.0
20:46:00	80.0
20:46:10	80.0
20:46:20	80.0
20:46:30	80.0
20:46:40	80.0
20:46:50	80.0
20:47:00	80.0
20:47:10	80.0
20:47:20	80.0
20:47:30	80.0
20:47:40	80.0
20:47:50	80.0
20:48:00	80.0
20:48:10	80.0
20:48:20	80.0
20:48:30	80.0
20:48:40	80.0
20:48:50	80.0
20:49:00	80.0
20:49:10	80.0
20:49:20	80.0
20:49:30	80.0
20:49:40	80.0
20:49:50	80.0
20:50:00	80.0
20:50:10	80.0
20:50:20	80.0
20:50:30	80.0
20:50:40	80.0
20:50:50	80.0
20:51:00	80.0
20:51:10	80.0
20:51:20	80.0
20:51:30	80.0
20:51:40	80.0
20:51:50	80.0
20:52:00	80.0
20:52:10	80.0
20:52:20	80.0
20:52:30	80.0
20:52:40	80.0
20:52:50	80.0
20:53:00	80.0
20:53:10	80.0
20:53:20	80.0
20:53:30	80.0
20:53:40	80.0
20:53:50	80.0
20:54:00	80.0
20:54:10	80.0
20:54:20	80.0
20:54:30	80.0
20:54:40	80.0
20:54:50	80.0
20:55:00	80.0
20:55:10	80.0
20:55:20	80.0
20:55:30	80.0
20:55:40	80.0
20:55:50	80.0
20:56:00	80.0
20:56:10	80.0
20:56:20	80.0
20:56:30	80.0
20:56:40	80.0
20:56:50	80.0
20:57:00	80.0
20:57:10	80.0
20:57:20	80.0
20:57:30	80.0
20:57:40	80.0
20:57:50	80.0
20:58:00	80.0
20:58:10	80.0

Editing DHT22

Temperature: 17.7°C

Humidity: 33.0%

Change

click

Humidity: 33.0%

Push error-401

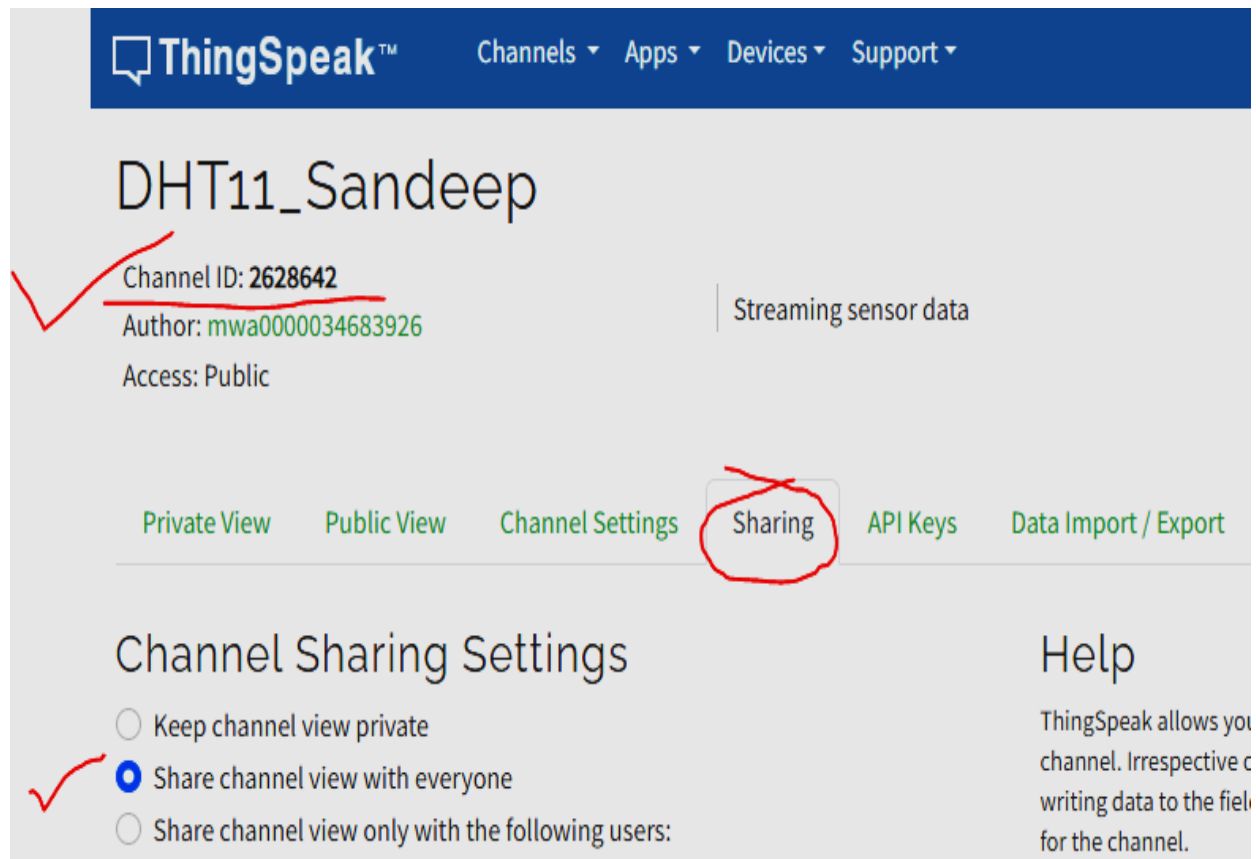
Temp: 17.70°C

Humidity: 33.0%

Data pushed successfull

Step-12 Accessing the IoT Sensor data on your Smartphone:

First go to the main screen of ThingSpeak portal, click on Sharing → select (click on) share channel with everyone → note down the channel ID. (see snap below)



Now, search the App '**ThingView**' – **ThingSpeak viewer** on play store and install it on your smartphone → Open the app → Click on '+' sign on the right bottom → click on Add channel → input the channel ID (found above) → click on search → click on DONE (confirm channel) → You can see your channel name (DHT11_Sandeep) there → click on that channel name → Now you must be able to see the IoT (DHT sensor) data on your smartphone in the form of graphs as shown below:

