SWE30011

IoT Programming

Project Instruction- Part 2

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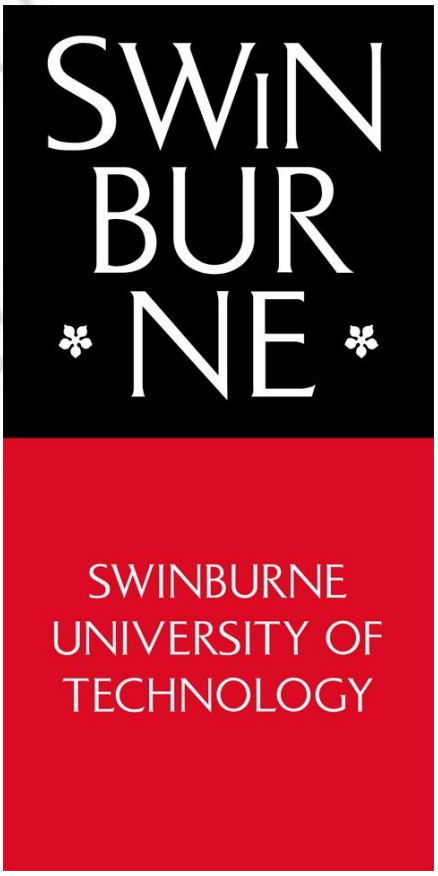


Aims:

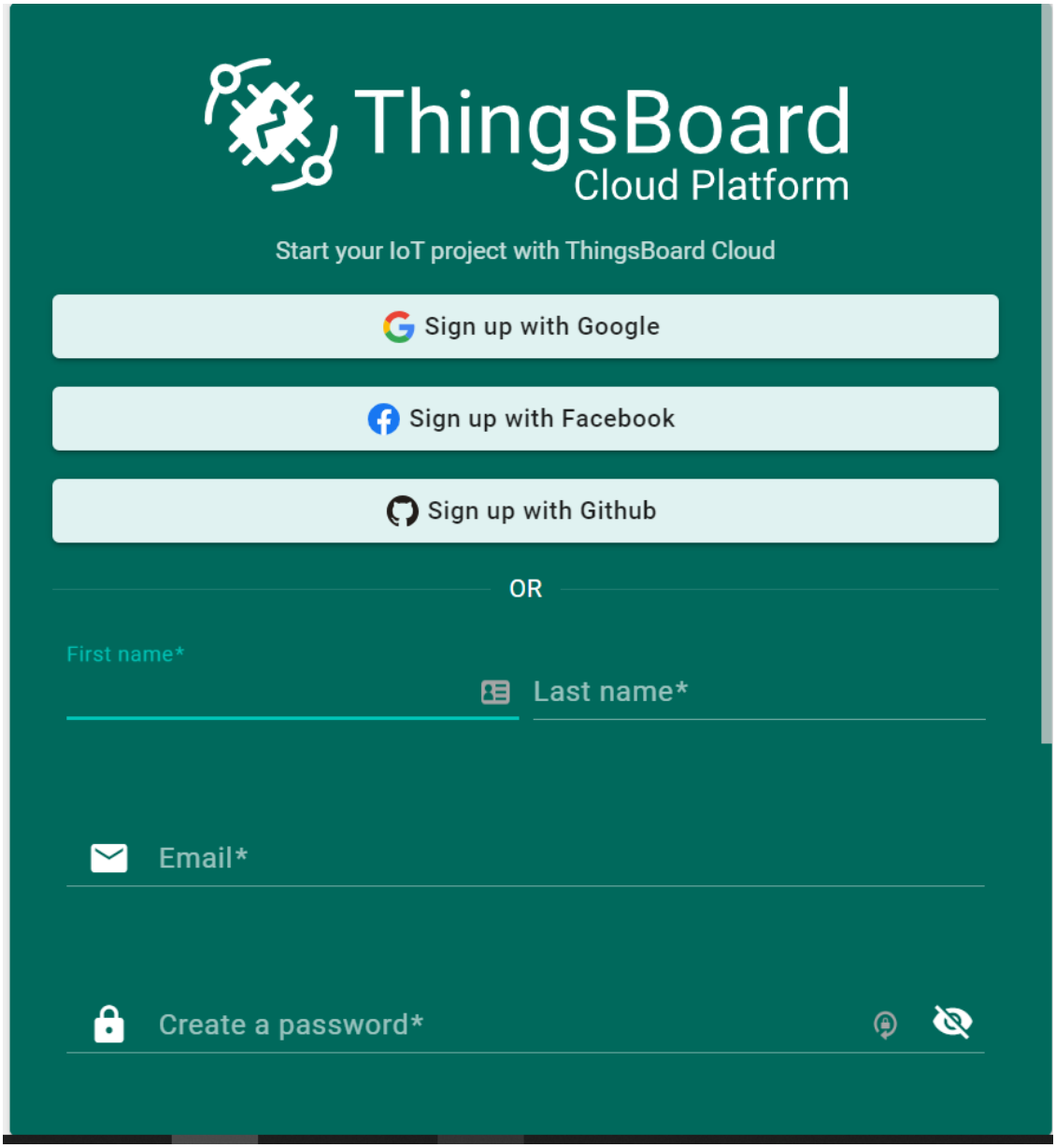
To connect and send data from Arduino to cloud (Thingsboard) via a Raspberry Pi VM.

Requirements and Preliminary Settings:

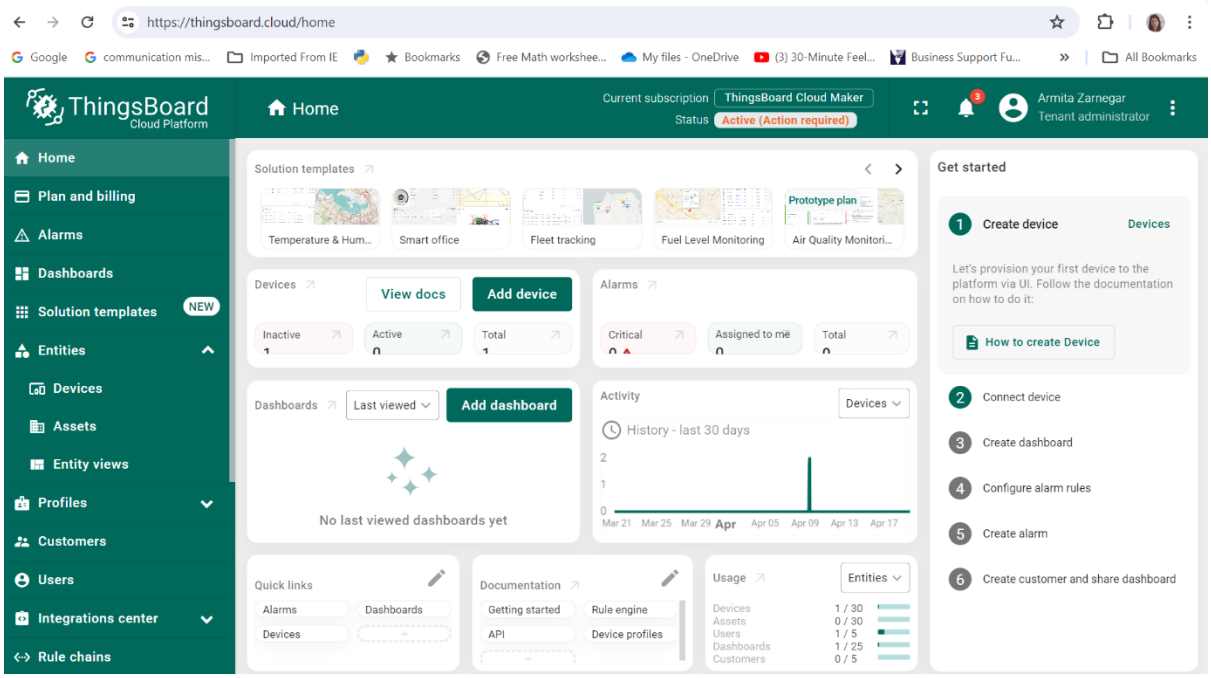
- Raspberry Pi Virtual Machine with Debian 11,
- Arduino Uno and its IDE ,
- Python version 3 or above installed on the Virtual Machine (refer to the previous assignment's document)
- A given code to run in Arduino IDE
- A given Python script to run in Raspberry Pi VM

Creating a Thingsboard account and device

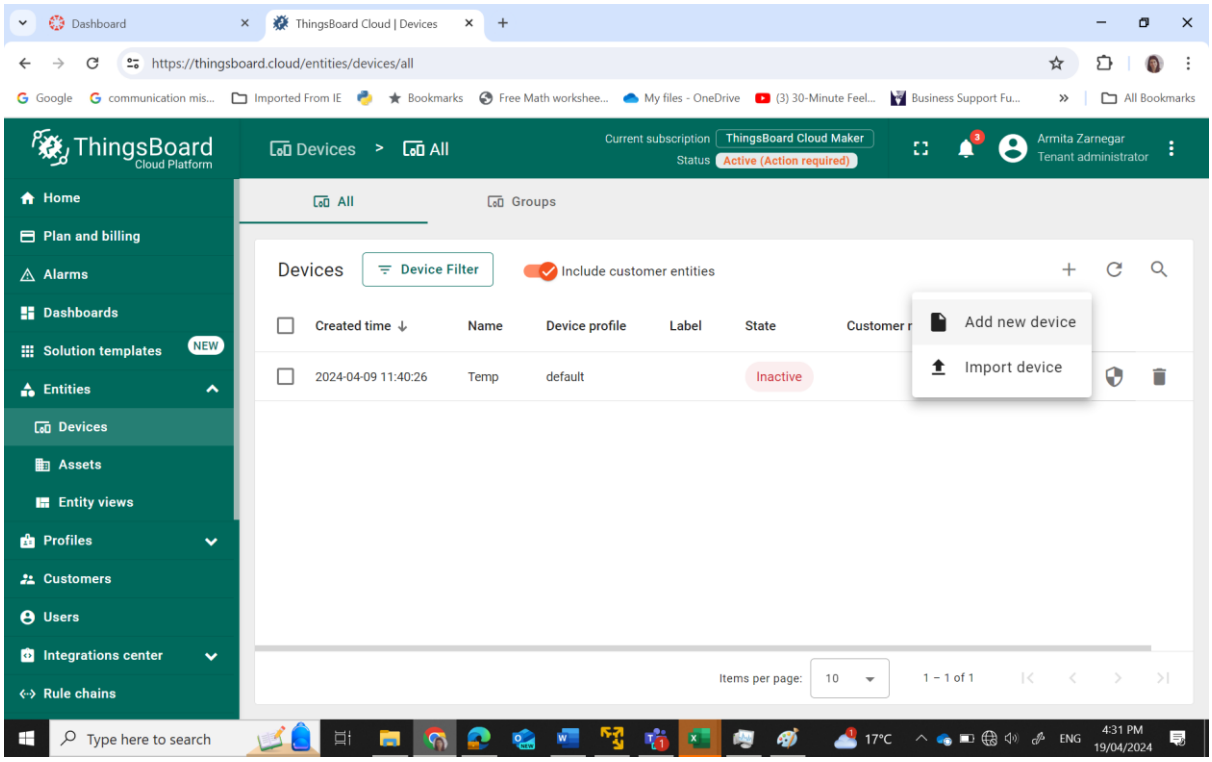
Visit Https://thingsboard.io/. From the menue choose "Try It Now" then "Start Free"



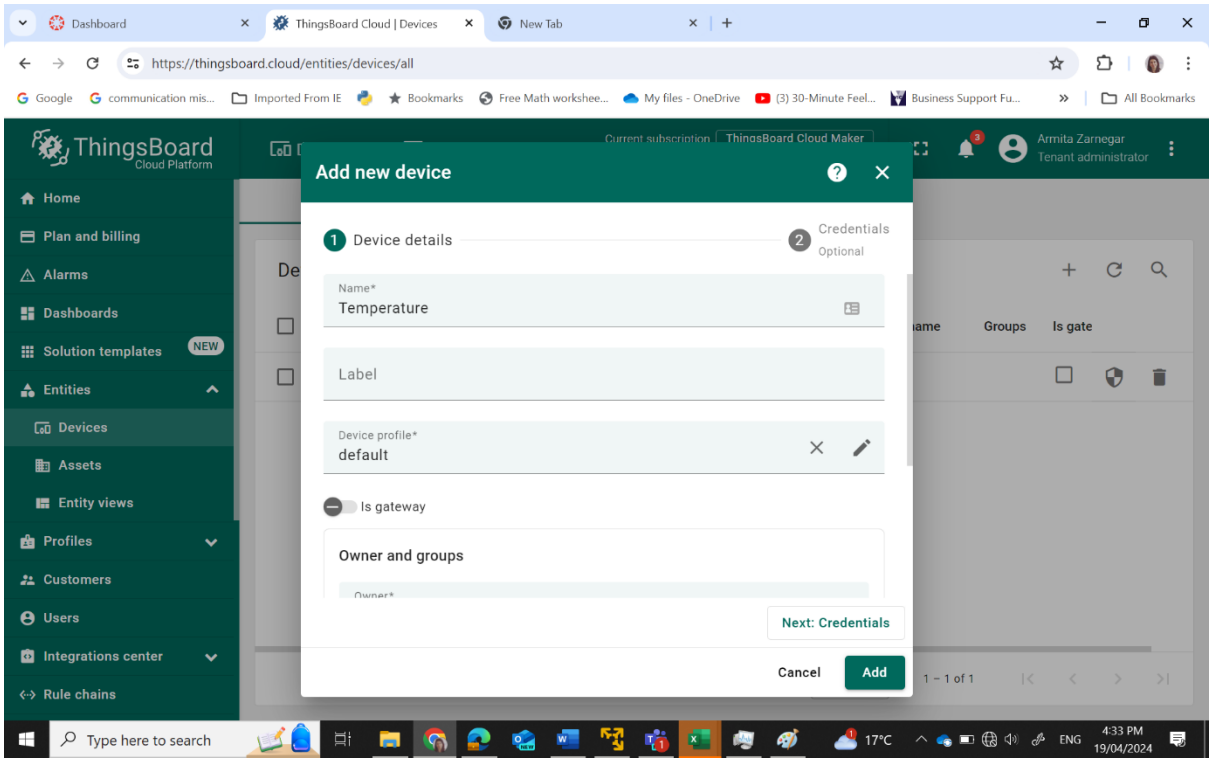
Use your Gmail account or a an email along with a password to sign up. You will need to confirm your email address. After successfully logging in, you will be directed to this dashboard.



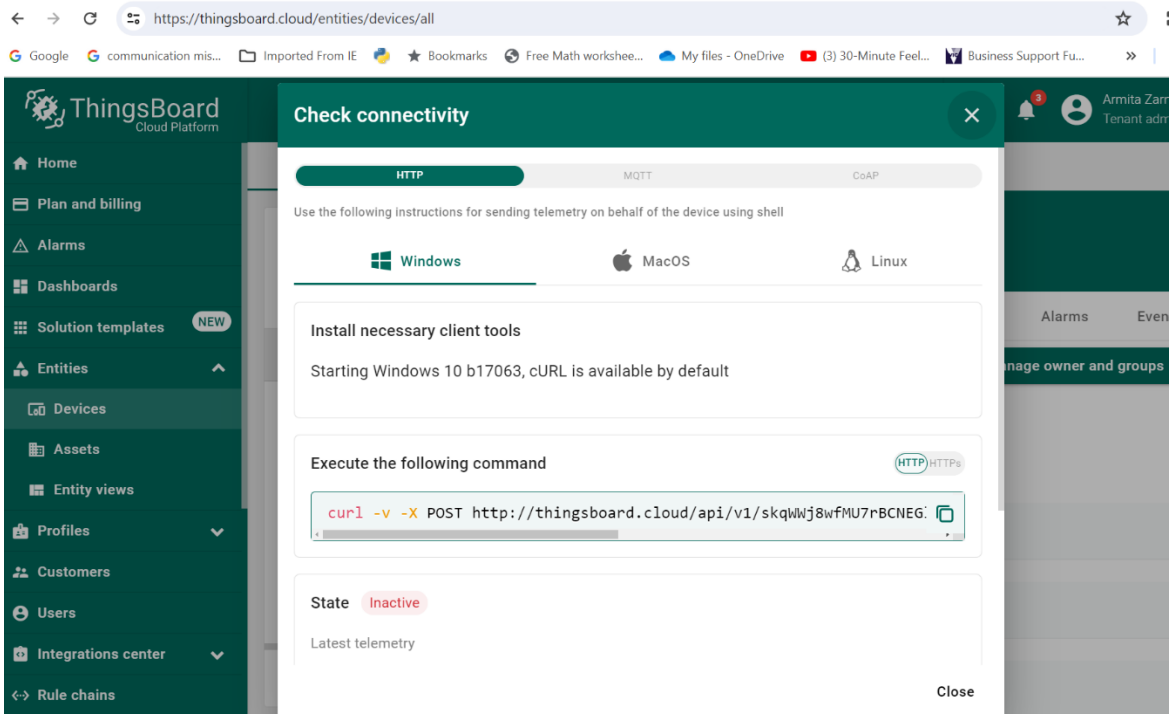
Then navigate to Entities and add a new device.



Choose a name for the device then leave all settings intact and add the device.

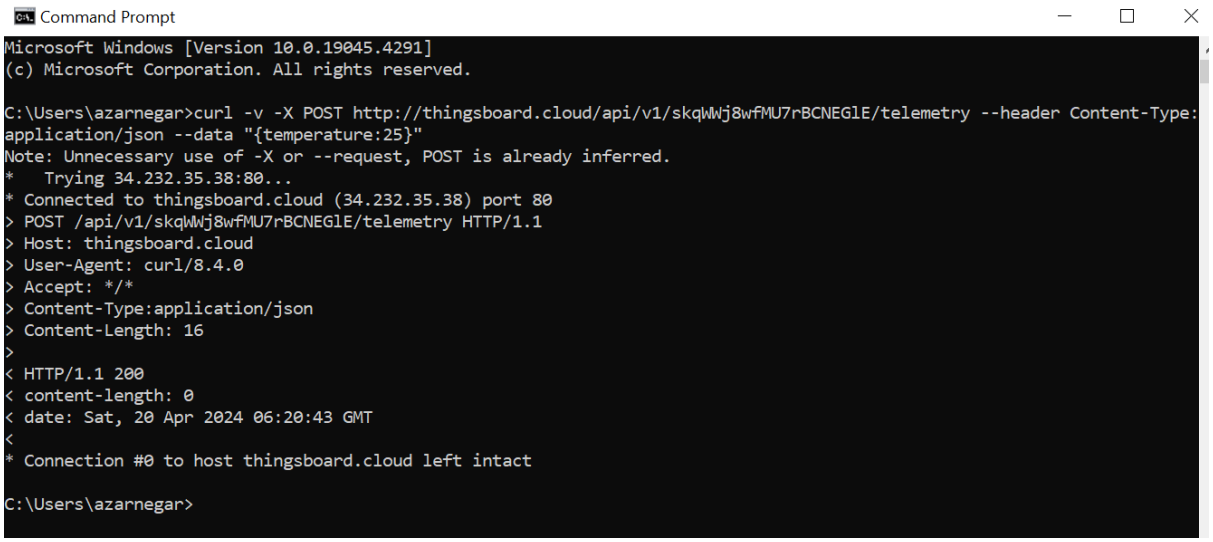


After creating the device, you need to connect to it to activate it. You can do this by clicking on the device and selecting 'Check Connectivity'. This will bring up the following menu.



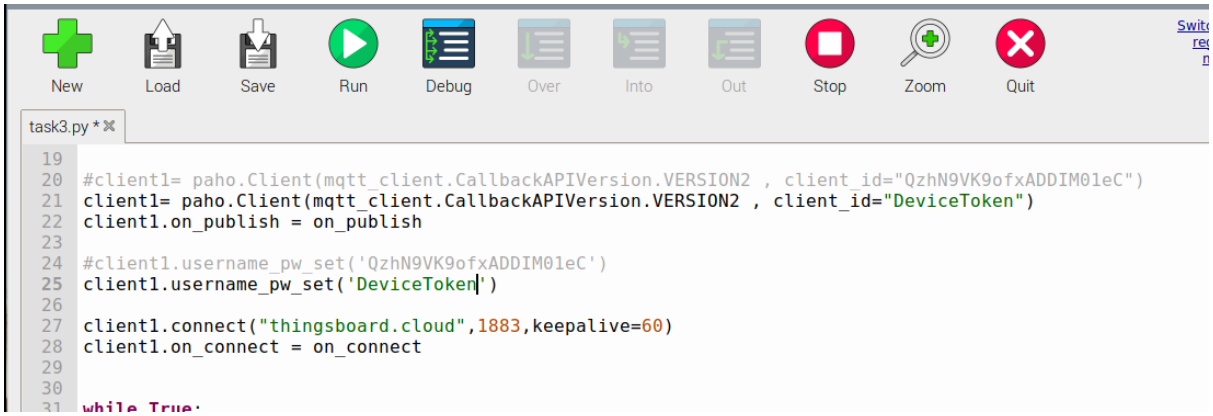
Select the command to run based on your client operating system. If you are using Windows, copy the command provided and run it in Command Prompt. To open Command Prompt (cmd), type it into the search box next to the Windows icon and

double-click on it. After running the command, you will see the following messages confirming the successful connection.

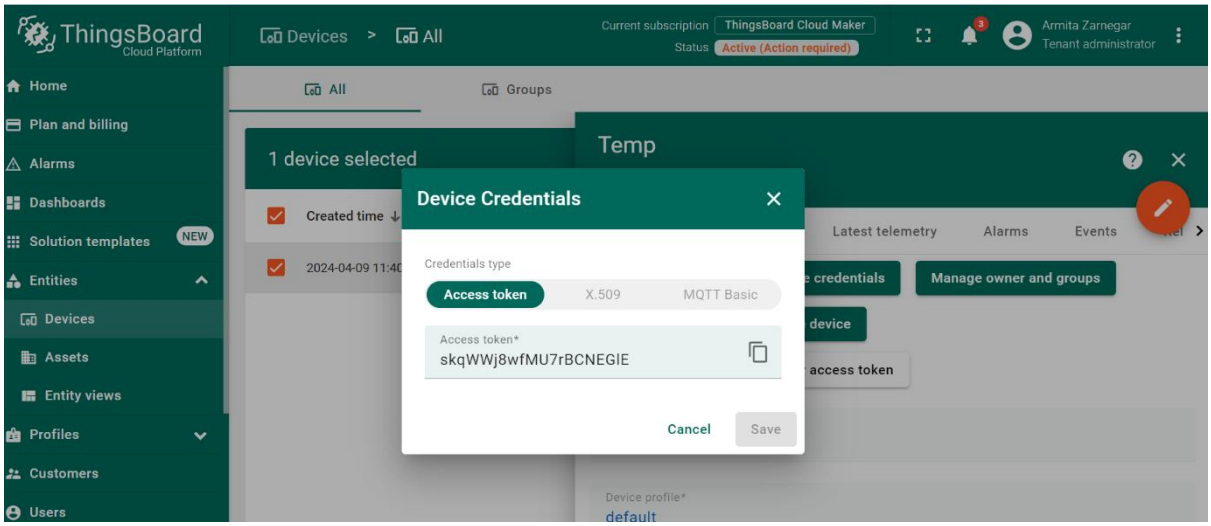


Now, you'll need to transfer the attached Python code to yourself via email or place it in the shared drive between the host and the VM for easy transfer to your VM. Once you have the Python code accessible on your VM, open a terminal and enter the following command: sudo pip install paho-mqtt

Next, open the provided Python code in the Thonny Python IDE. To do this, click on the Raspberry icon, then navigate to 'Programming' and select 'Thonny'. In the code, replace the placeholder token with your specific token. To obtain your token, proceed to the next step.



To obtain the access token, log in to your ThingsBoard account and navigate to 'Devices'. Select the device you have just created, then click on the device to open a menu. From the menu, select 'Manage Credentials'.



Firstly, run the initial piece of code provided in the Arduino IDE. Next, execute the Python code on the Raspberry Pi VM. Upon successful execution, navigate to the 'Device' tab and click on 'Latest Telemetry'. You should then observe the temperature reading that the Arduino sent (in our code, it is 34) displayed there.