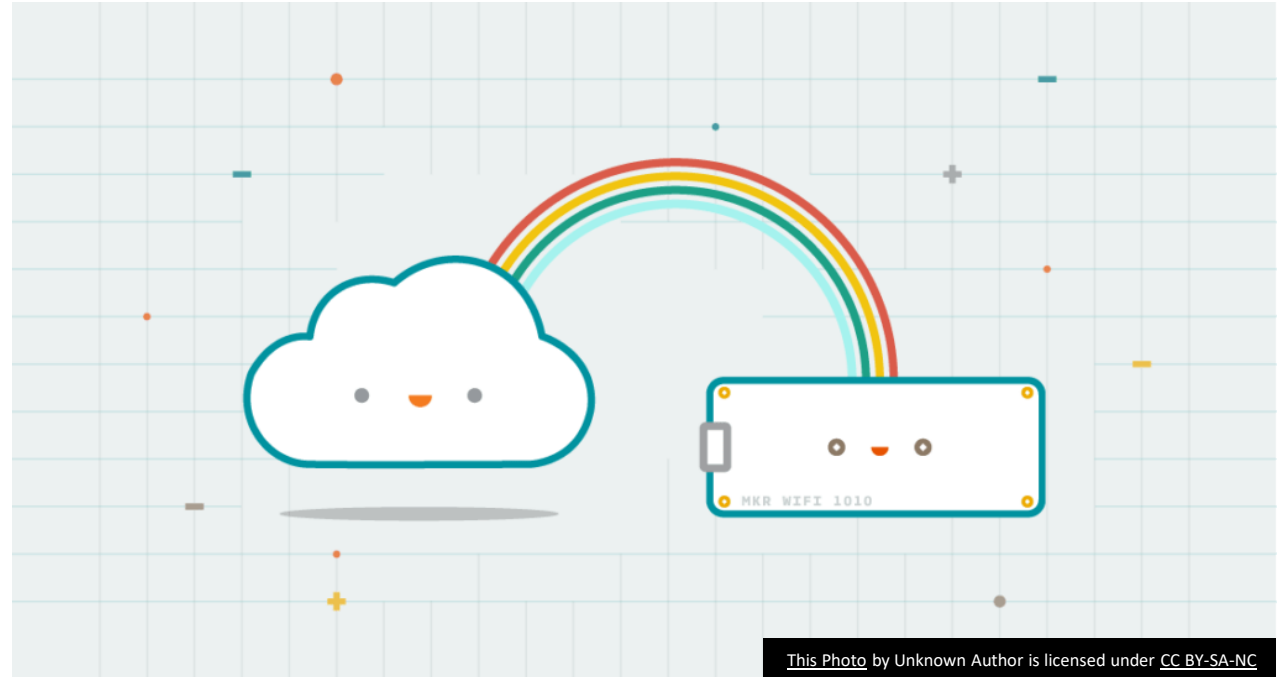
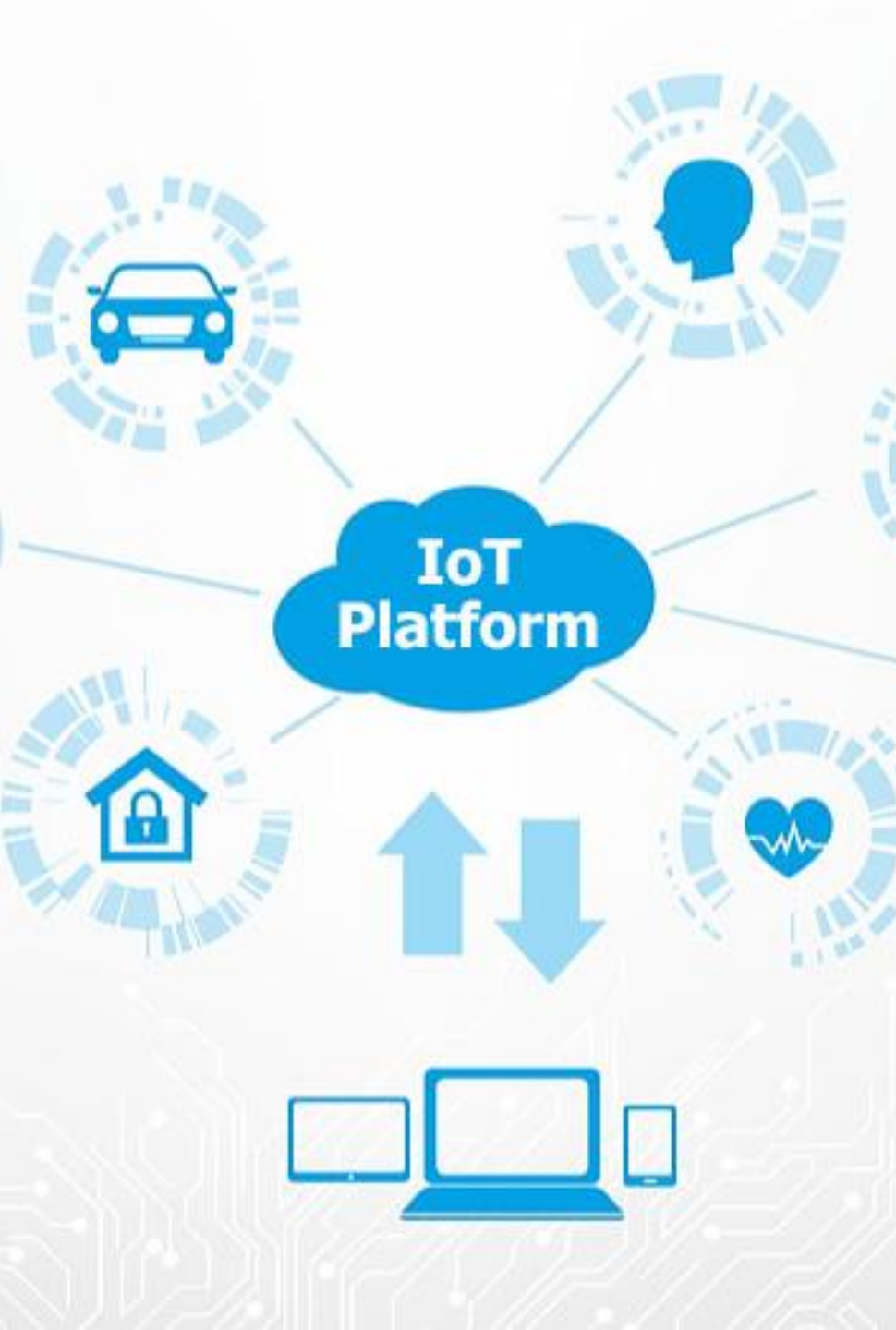


Arduino Cloud

What's Arduino Cloud

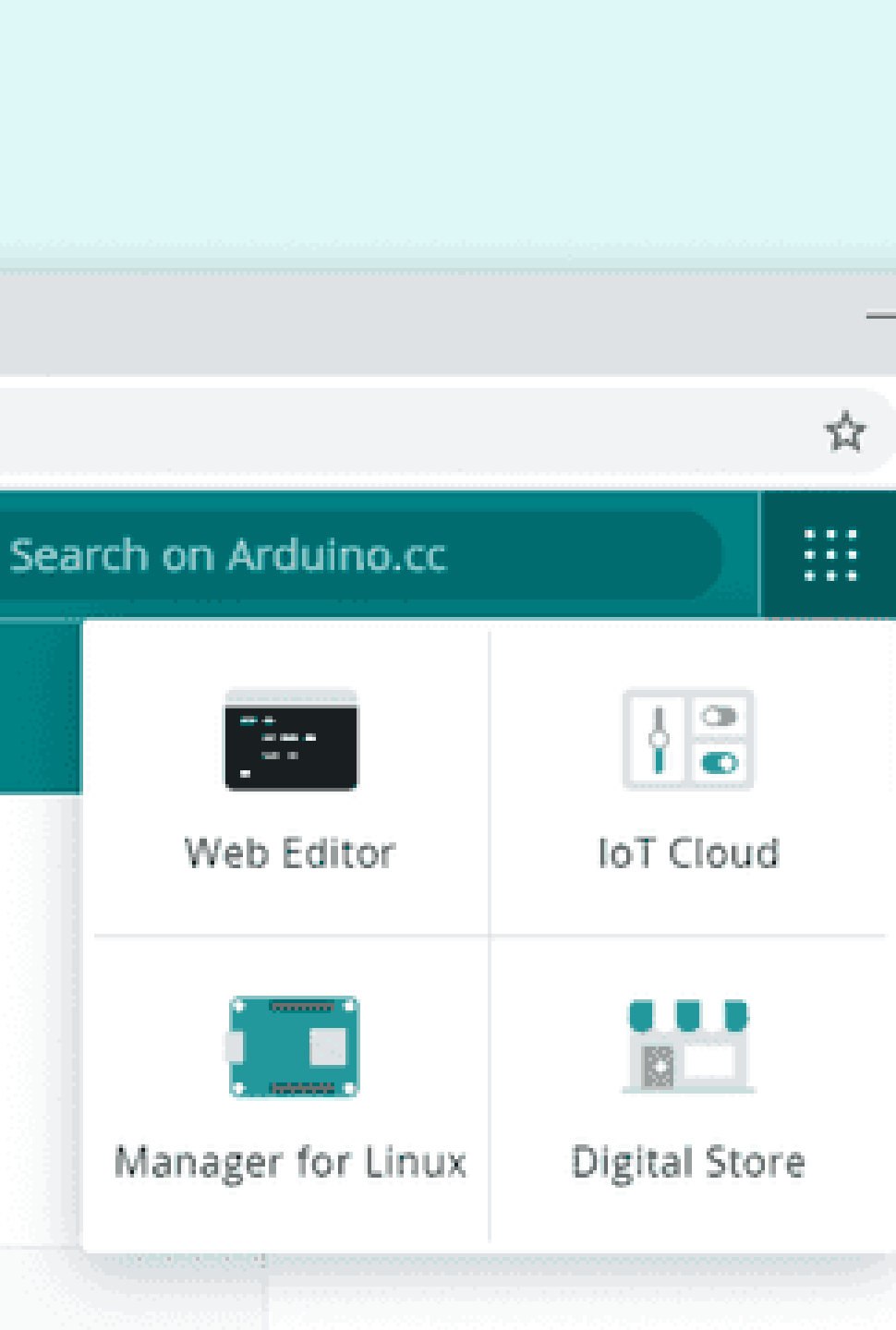
- Arduino Cloud is a **platform** which allows users to remotely manage, monitor and control IoT devices.
 - connect, monitor and control devices through the internet, anywhere, any time.
- Rapid set up IoT devices and applications, and manage data from multiple devices.





What's an IoT Platform?

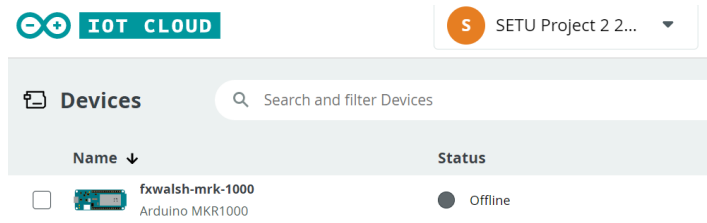
- IoT (Internet of Things) platform is a software/hardware infrastructure that enables the development, deployment, and management of IoT solutions and applications.
 - Similar to google drive(develop/deploy/manage documents and files)
 - Often cloud based(as in you don't host it on your own computers)
- Typical components of an IoT platform are:
 - managing and controlling connected devices (your Arduino)
 - Data Collection and Processing(e.g. collect data from environment)
 - Visualisation and analysis



Using the Arduino Cloud

- Use browser-based IDE
- You'll need to create an Arduino account
 - You can use Google, Github, Facebook, Apple ID if you wish
- Once signed in, you can access the IoT Cloud through the Menu

Devices in Arduino Cloud



- Configuration is required once for every new device.
 - In our case the Arduino MKR 1000
- In Arduino IoT Cloud, add a device through the Devices menu option
- Once a device is successfully configured it can be used to create a “thing”.

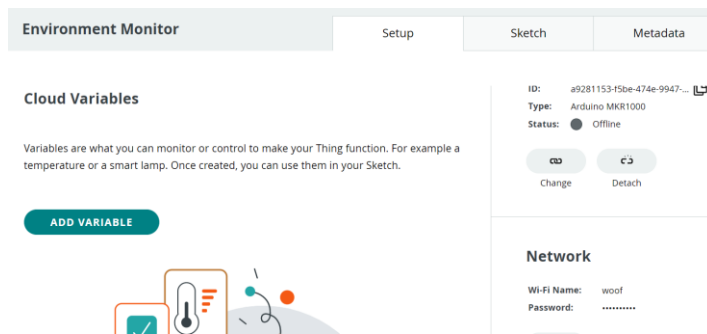
Things in Arduino Cloud

- A “Thing” is a combination of a Device and configuration details such as wifi config, variables, and other settings.
- Needs to be associated with a device to work
- Why are Devices and Things distinct concepts?
 - You can easily swap the actual hardware without reconfiguring everything from scratch: just detach a thing from a device, and reassign it to another device.(for example, you want to use another/different Arduino board

Variables in Arduino Cloud

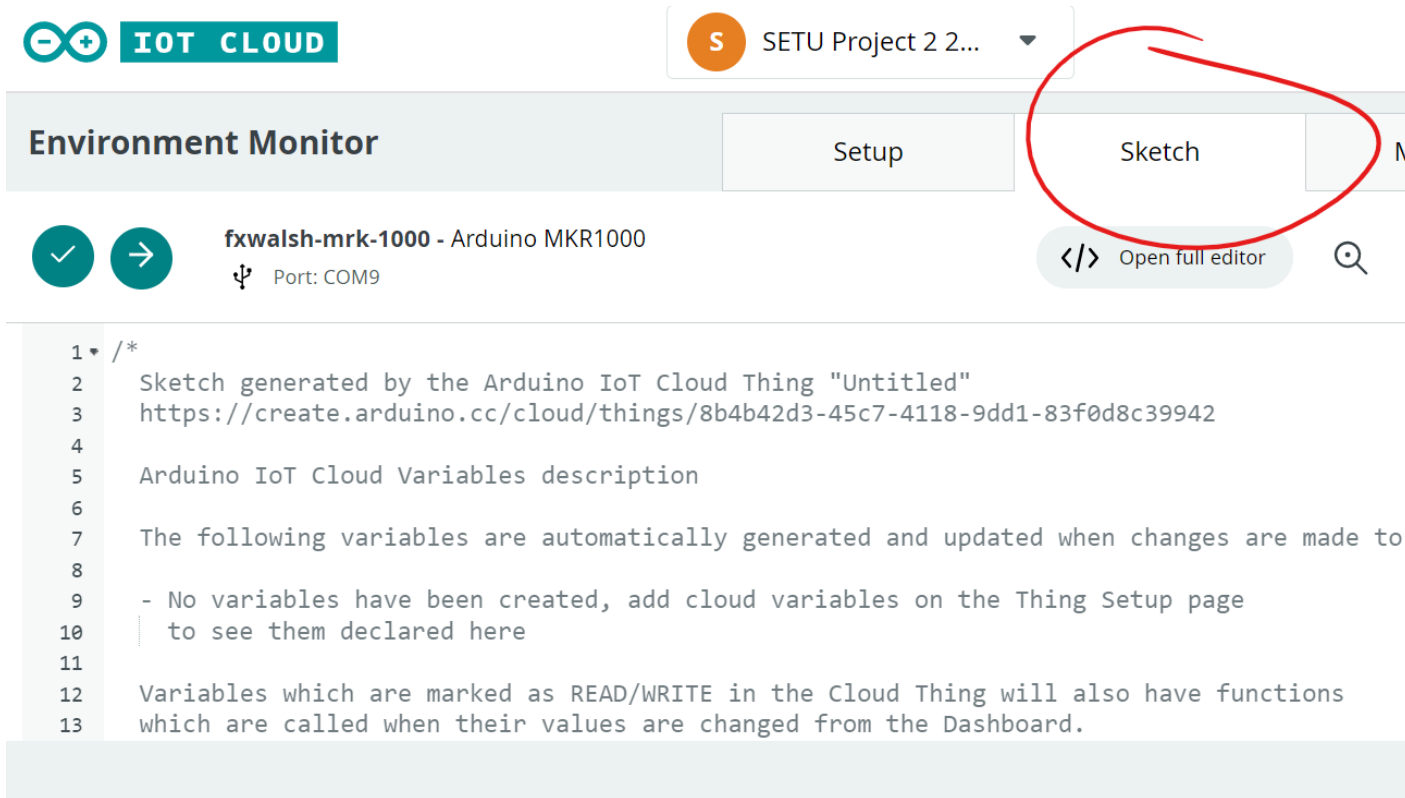
- A thing can have one or more **variables**.
- A variable can be used for:
 - collecting data over time in the cloud (sensor readings)
 - show data in real-time in a dashboard
 - receive changes originated from a dashboard or other linked devices
- Arduino IoT Cloud will handle all the communication and synchronization behind the scenes.
- Variables can be used directly just like any other variables in an Arduino sketch.
- Can be used to share data with other devices/dashboards.

Network Configuration



- You need to connect your Arduino to the Wi-Fi network.
- The credentials entered are saved in the Secret file, inside the sketch.
- Part of the “Thing” configuration.

Coding in Arduino Cloud



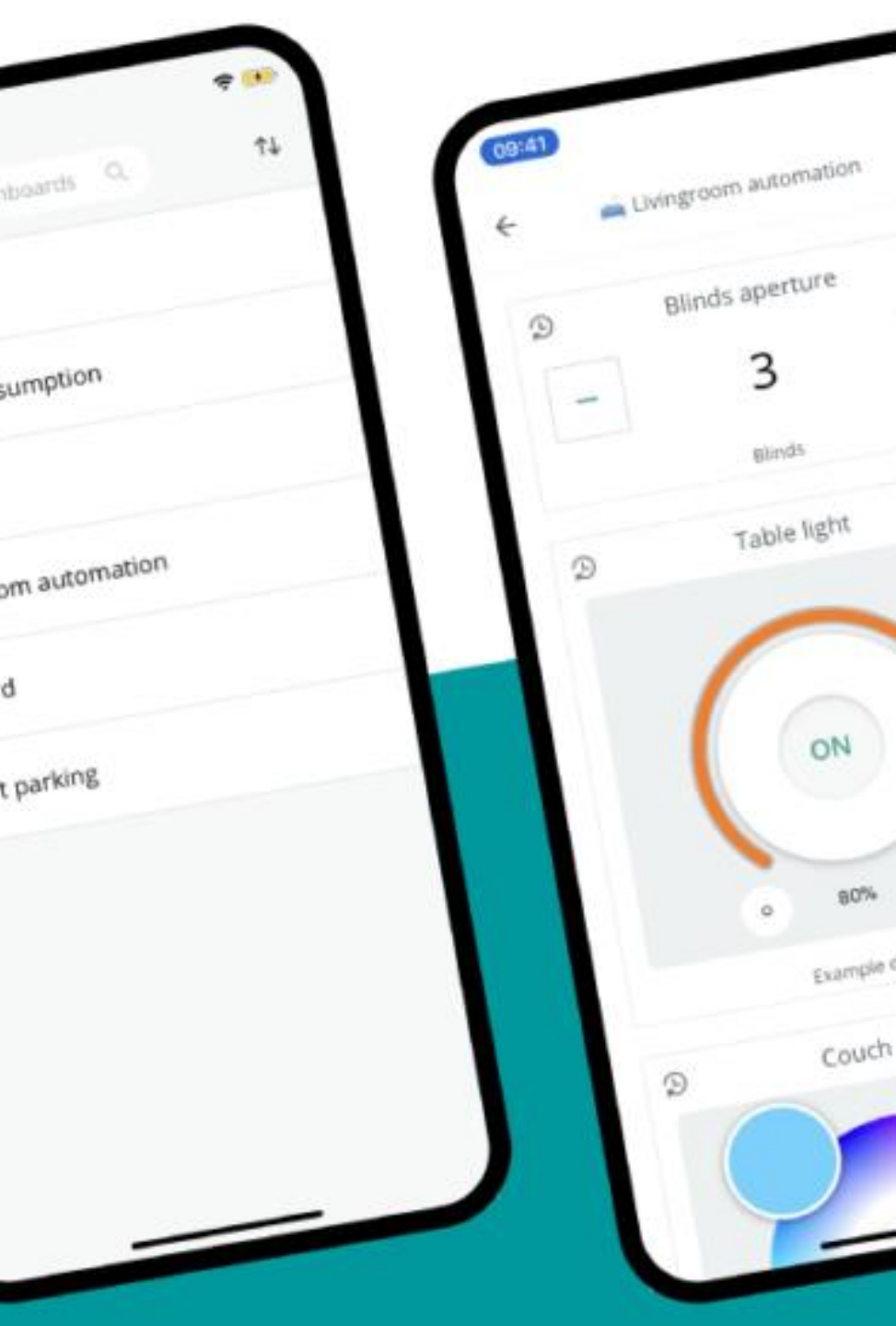
The screenshot shows the Arduino Cloud web interface. At the top, there's a navigation bar with the 'IOT CLOUD' logo on the left and a project dropdown menu on the right labeled 'SETU Project 2 2...'. Below the navigation bar, there's a tabbed interface with three tabs: 'Environment Monitor', 'Setup', and 'Sketch'. The 'Sketch' tab is highlighted with a red circle. Below the tabs, there's a status bar showing a green checkmark, a green arrow, the device name 'fxwalsh-mrk-1000 - Arduino MKR1000', and the port 'Port: COM9'. To the right of the status bar, there's a button with a code icon and the text 'Open full editor'. Below the status bar, the main area displays a code editor with the following content:

```
1 /*
2  Sketch generated by the Arduino IoT Cloud Thing "Untitled"
3  https://create.arduino.cc/cloud/things/8b4b42d3-45c7-4118-9dd1-83f0d8c39942
4
5  Arduino IoT Cloud Variables description
6
7  The following variables are automatically generated and updated when changes are made to
8
9  - No variables have been created, add cloud variables on the Thing Setup page
10  to see them declared here
11
12  Variables which are marked as READ/WRITE in the Cloud Thing will also have functions
13  which are called when their values are changed from the Dashboard.
```

- Clicking on “Sketch” tab in the Thing allows you to code
 - Works similar to IDE you’ve been using so far.
- Initially, automatically generated code is found in the editor

Coding in the Arduino Cloud

- The sketches generated automatically in IoT Cloud include four files:
 - thingProperties.h: This is a file containing the configuration details generated by the Arduino IoT Cloud. **it should not be edited.**
 - sketch.ino: This file includes the main Arduino sketch that you edit
 - Secret: This is a file contains sensitive data like passwords and API keys that will be protected and hidden from public access. The network configuration details are saved in this file.
 - ReadMe.adoc: This is a Read Me file as a placeholder for adding a description of the project.



Arduino IoT Remote App

- App gives you access to Dashboards.
- Gives you with the ability to access, monitor or control your IoT projects from anywhere.
- iOS and Android apps available for installation.