

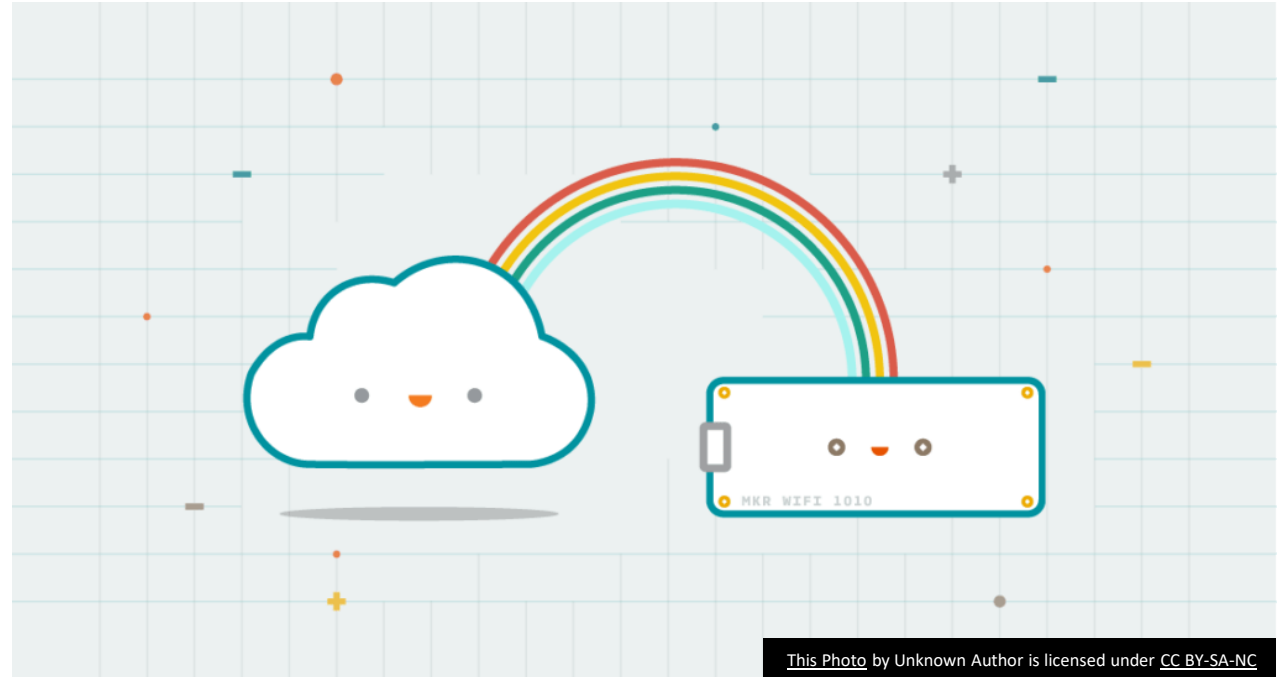


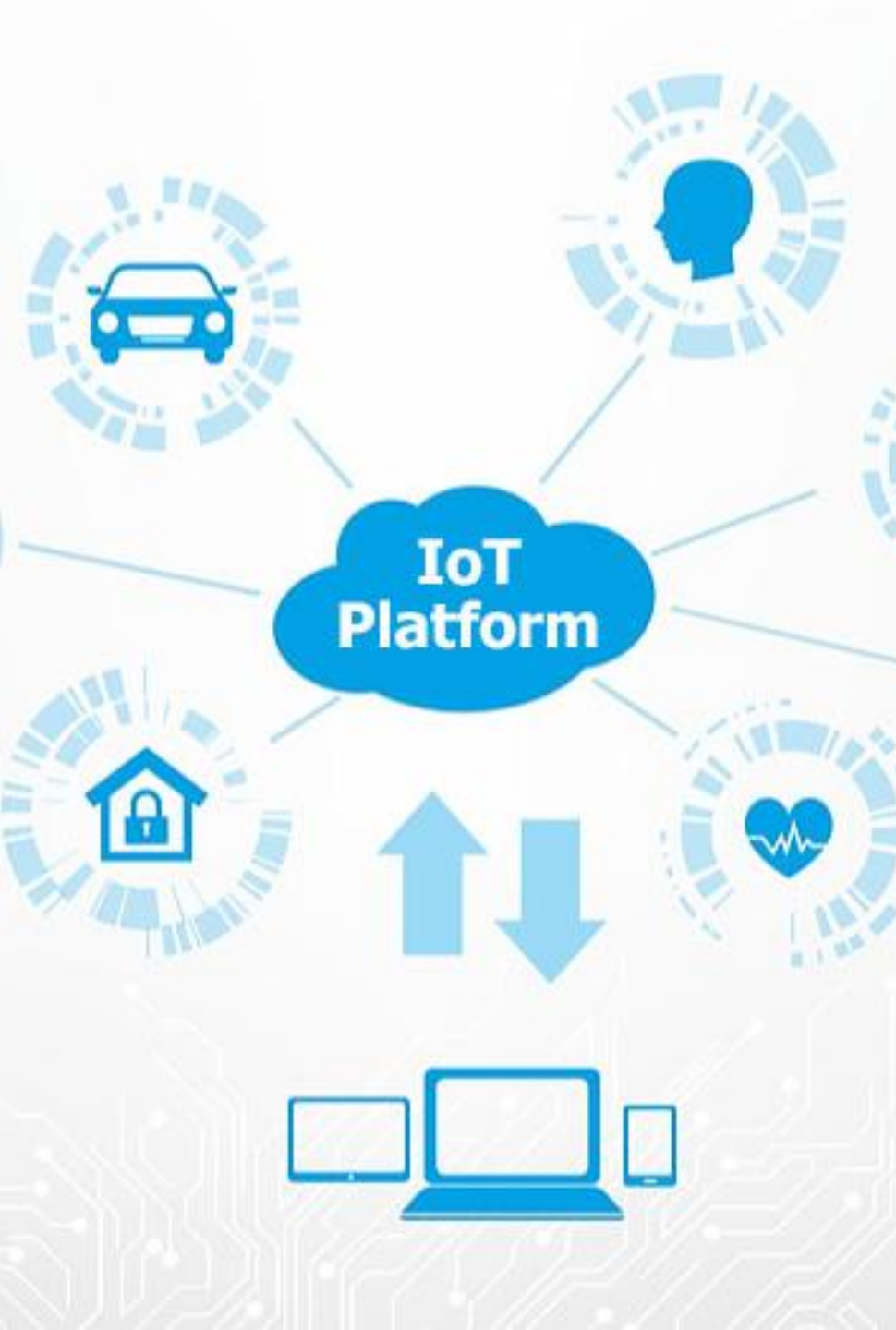
A brief Intro

# 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.

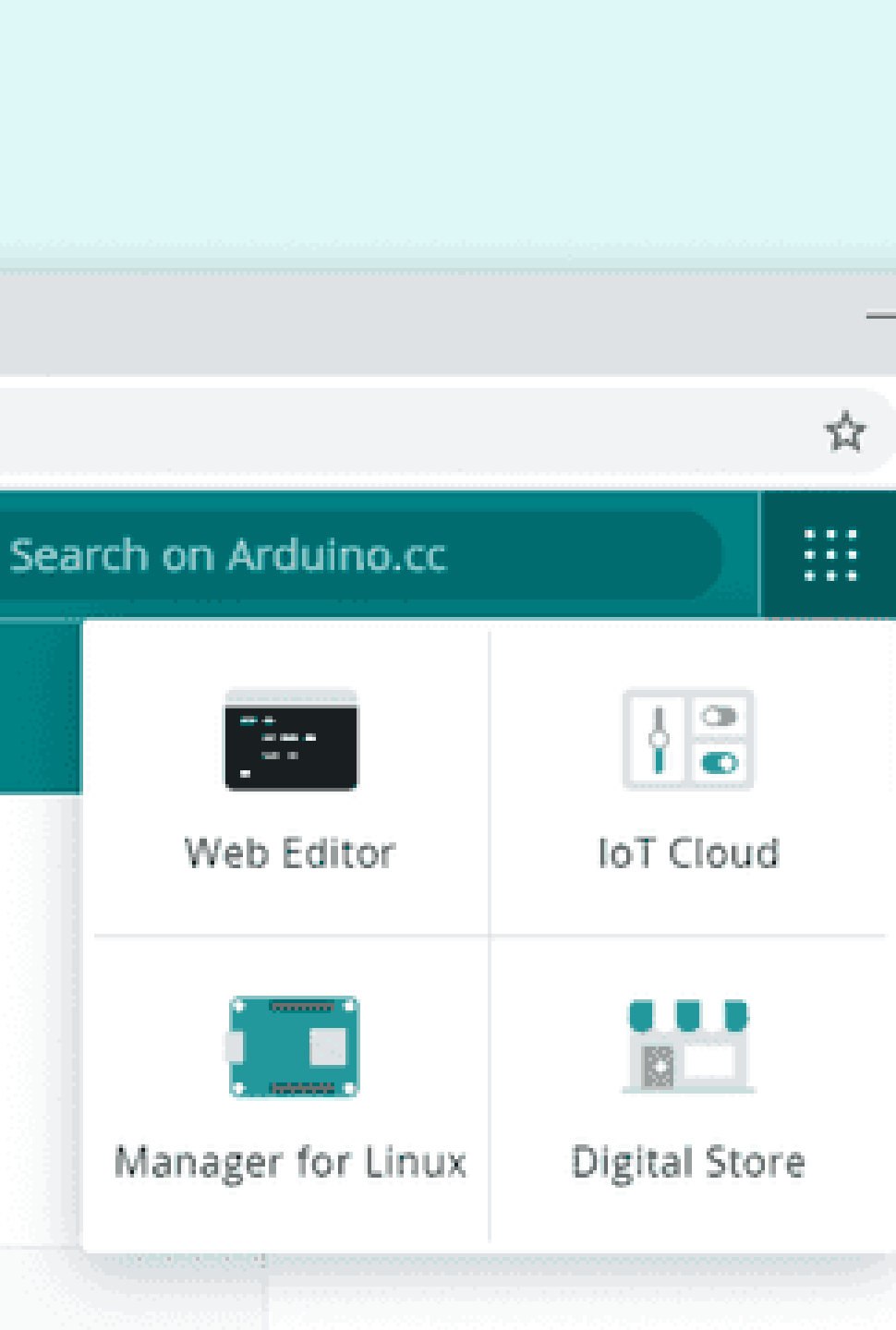




# What's an IoT Platform?

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- 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



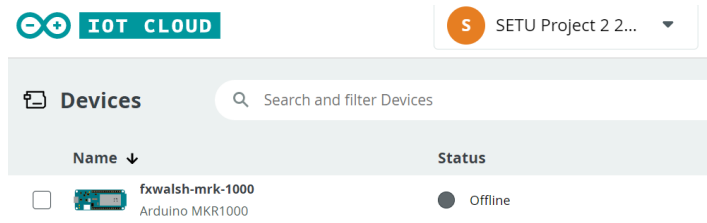
# Using the Arduino Cloud

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- 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

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- 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

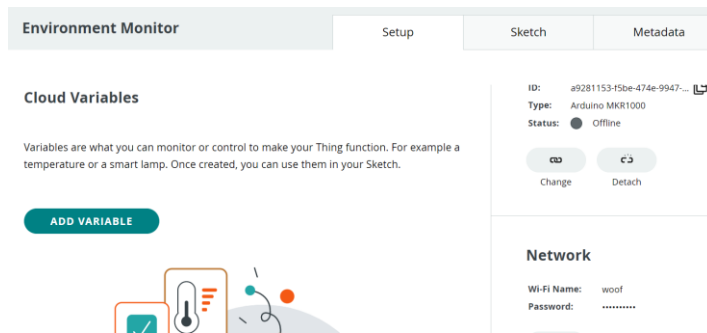
- A “Thing” is a combination of a Device and configuration details such as wifi config, variables, and other settings.
- Needs to be associated with a device to work
- Why are Devices and Things distinct concepts?
  - You can easily swap the actual hardware without reconfiguring everything from scratch: 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

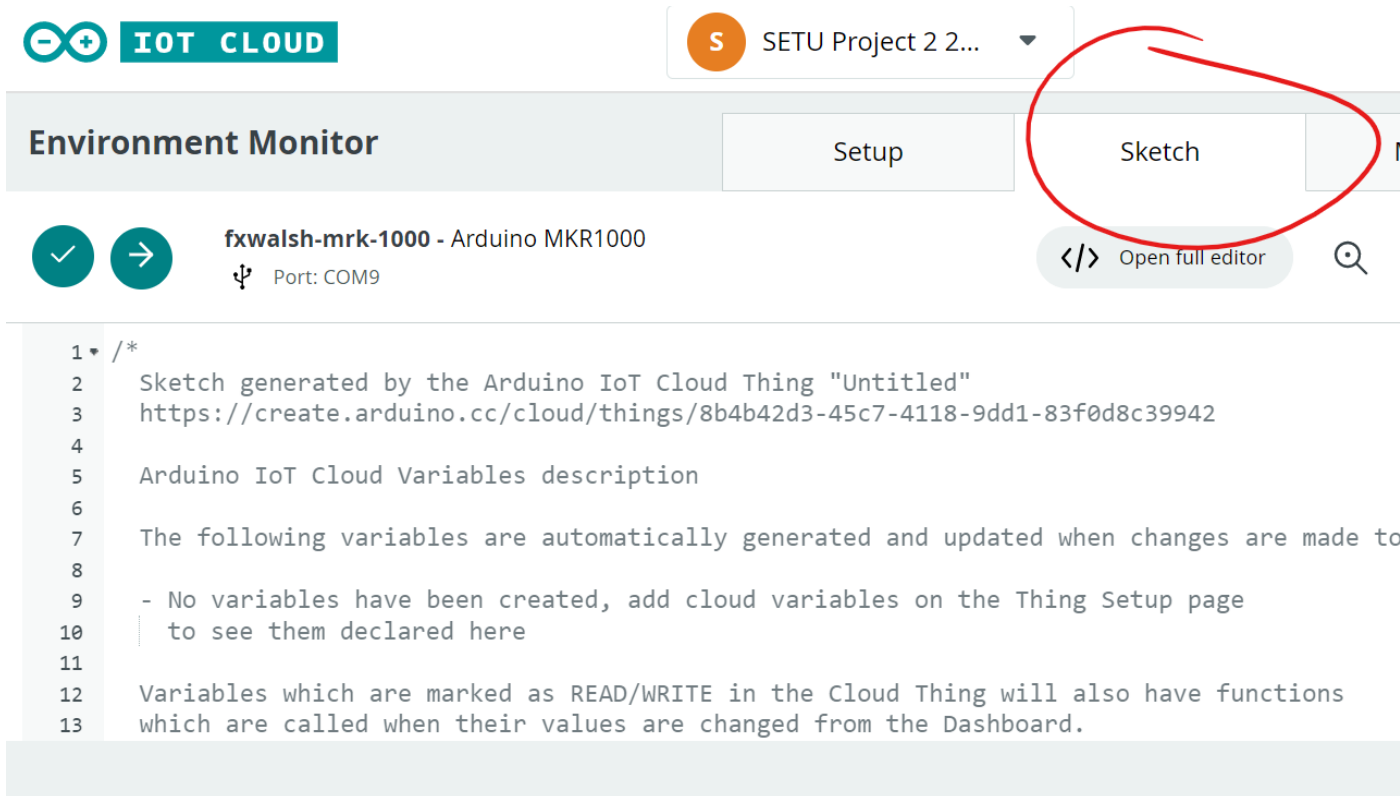
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- You need to connect your Arduino to the Wi-Fi network.
- The credentials entered are saved in the Secret file, inside the sketch.
- Part of the “Thing” configuration.



# Coding in Arduino Cloud



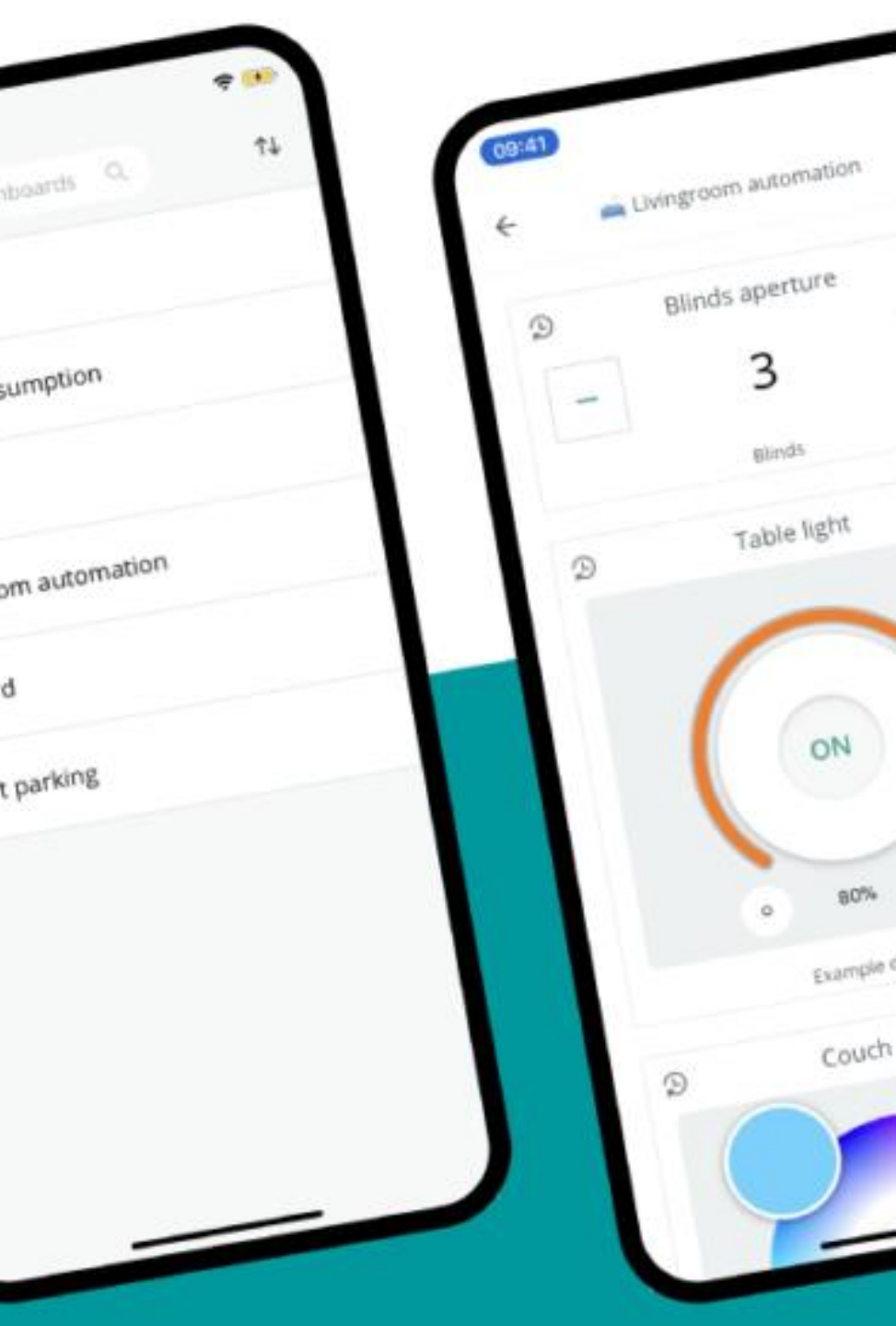
The screenshot shows the Arduino Cloud web interface. At the top, there's a header with the 'IOT CLOUD' logo and a project dropdown menu labeled 'SETU Project 2 2...'. Below this is a navigation bar with tabs for 'Environment Monitor', 'Setup', 'Sketch', and 'M'. The 'Sketch' tab is highlighted with a red circle. Below the navigation bar, 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'. Below the status bar is a code editor with a light blue background. The code is a comment block starting with '/\*' and ending with '\*/'. The text inside the comment describes the sketch as generated by the Arduino IoT Cloud Thing 'Untitled' and provides a URL to the thing's page. It also mentions that the following variables are automatically generated and updated when changes are made to the thing, and that no variables have been created yet, so the user should add cloud variables on the Thing Setup page to see them declared here. Finally, it states that variables marked as READ/WRITE in the Cloud Thing will also have functions which are called when their values are changed from the Dashboard.

```
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

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- 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.