

Tutorial: Smart-Parking: IoT project

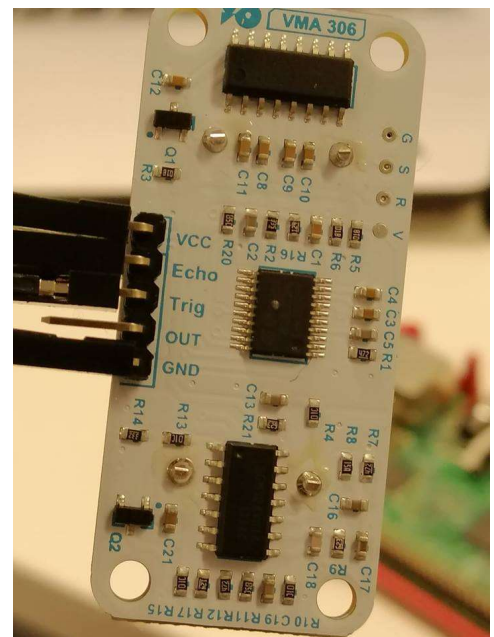
Requirements:

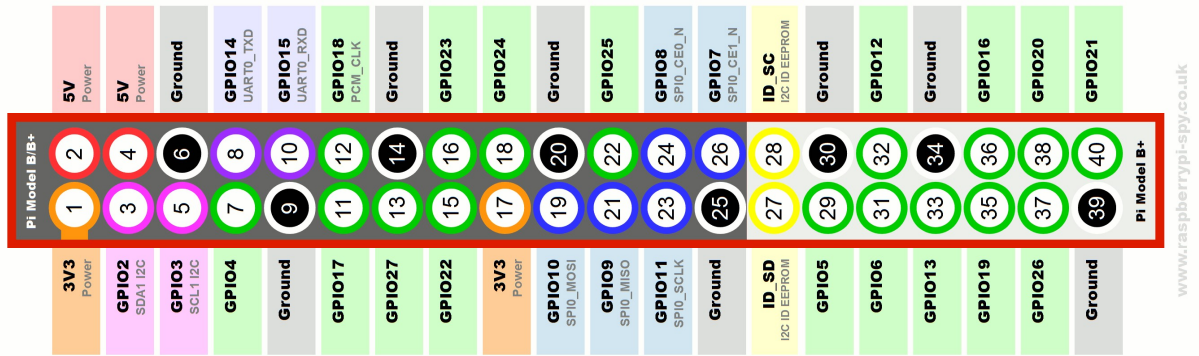
- Hardware
 - Raspberry pi (or Arduino)
 - Breadboard
 - LED's
 - Ultra-sound distance sensor
 - Resistors
 - Connector cables
- Software
 - A python script for reading the data on the pi and sending it to the cloud(script in repo)
 - A cloud account
 - An IoT platform and starter on the cloud
 - At least 1 cloud device
 - An application that receives the data and displays it

Connect hardware:

you could use an Arduino for this project but then you will need a power source since the sensor requires 5V.

1. first thing to do is connect sensor:
 - VCC is for your power attachment, connect this to pin 2 or 4 on your pi (Red)
 - Trig and Echo are for measurements so connect them to GPIO-pins
 - GND is grounding connect it to a grounding pin (Black)

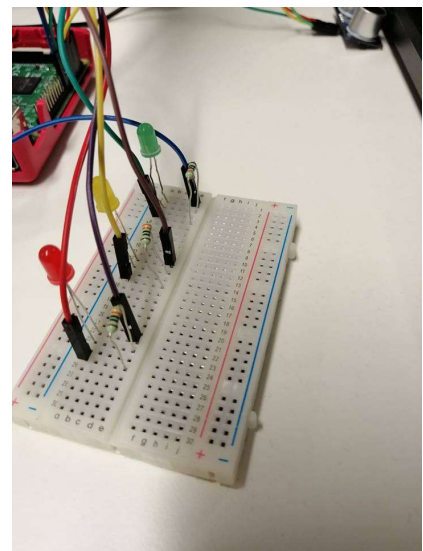




make sure the pins are placed correctly otherwise the script won't work. Modify the script based on what pins you use.

2. next connect the LED's to the breadboard:
 - you will need resistors when attaching the LED's so put the LED's in series with the resistors.
 - The sequence should be: GPIO(-in), resistor, LED, GND(-out)

Your hardware is now setup!



Connect your software

1. Get the script up and running

Connect to your pi and go to github to download the script(tutorialscript.py).

The script wont work yet, modify it so it will use your specific data. Some parts you will not yet be able to fill in before the cloud setup. Therefore, after the cloud setup, go back to your script for these parts.

Even then the script still needs some modules:

Download these modules, one you always need to download is 'ibmiotf'

Pip3 install ibmiotf

Run your script with:

Python3 tutorialscript.py

Now your sensors work but you still need the Cloud.

2. Cloud setup

- make an IBM cloud account
- login to the IBM cloud platform

The screenshot shows the IBM Cloud landing page. On the left, a dark blue banner contains the text 'Welcome to IBM Cloud' and 'Start building immediately using 190+ unique services.' Below this is a red-bordered button labeled 'Create an IBM Cloud account'. Further down, it mentions a '\$200 credit when you upgrade'. On the right, the 'Log in to IBM Cloud' section is highlighted with a red box. It includes a dropdown menu for 'ID' (currently showing 'IBMid'), a 'Remember me' checkbox, a password field with an eye icon, and a 'Continue' button. Links for 'Forgot ID?' and 'Forgot password?' are also present. At the bottom right, there is a 'Cookie Preferences' link.

- make an IoT platform

The screenshot displays the IBM Cloud Catalog interface. The top navigation bar includes the IBM Cloud logo, a search bar, and links for Catalog, Docs, Support, and Manage. The 'Catalog' link is highlighted with a red box. Below the navigation bar, a search bar contains the text 'label:lite'. The main content area is divided into two sections. On the left, a sidebar lists 'All Categories (60)' with various options like Compute, Containers, Networking, Storage, AI, Analytics, Databases, Developer Tools, Integration, Internet of Things (1), Security and Identity, Starter Kits, Web and Mobile, and Web and Application. The 'Internet of Things (1)' category is selected and highlighted with a red box. On the right, the 'Internet of Things' section is displayed, featuring a card for the 'Internet of Things Platform' (Lite • IBM). This card is also highlighted with a red box. The card includes a description: 'This service is the hub of all things IBM IoT, it is where you can set up and manage your connected devices so that your apps can access their live and historical data.' A 'FEEDBACK' button is visible on the far right.

- make a device-type MQTT-client

IBM Watson IoT Platform

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+ Add Device Type

Device Types

Type the name to search for

This table lists all device types that are defined. You can filter the list and search for the name and description. You can modify and configure existing device types and add new device types.

<input type="checkbox"/>	Name	Description	Number of Devices	Class ID	
2 results					
<input type="checkbox"/>	Android		1	Device	
<input type="checkbox"/>	MQTT-client		2	Device	

Cookie Preferences

- make a device from the device-type

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+ Add Device

Browse Devices

Type the Device ID to search for

All Devices Diagnose

This table shows a summary of all devices that have been added. It can be filtered, organized, and searched on using different criteria. To get started, you can add devices by using the Add Device button, or by using API.

<input type="checkbox"/>	Device ID	Device Type	Class ID	Date Added	Descriptive Location	
3 results						
<input checked="" type="checkbox"/>	App2	Android	Device	Apr 4, 2019 10:32 AM		
<input type="checkbox"/>	p1	MQTT-client	Device	Apr 3, 2019 3:36 PM		
<input type="checkbox"/>	p2	MQTT-client	Device	Apr 3, 2019 3:16 PM		

Cookie Preferences

STORE THE TOKEN SO YOU CAN CONNECT!!!! You will need to put it in the script.

Now you have a working cloud that receives the data.

3. make an android application and connect to cloud

- You can choose whatever application you want to make, for connecting to the cloud there is a lot of (al be it somewhat aged) information out there for different types of application.
- If working with android, the device-type should be 'Android' and not whatever type you made on the cloud.
- The application should be subscribed to get the information
- If you want to control LED's from the application, you will need to publish this to the cloud

