

# **Lecture #7**

# **Google Assistant**

**Android Things 2020**

# What we will build

- A custom Google Assistant device.
- It will use a button to trigger a microphone and playback the Assistant answer on the speaker.



Image source: <https://aiyprojects.withgoogle.com>

# What we will learn

- Record and playback audio from I2S devices.
- Use the Google Assistant gRPC API.



Image source: <https://dpi.wi.gov>

- ✓ Development board that is running Android Things.
- ✓ Microphone and speaker.
- ✓ WiFi/Ethernet connection.
- ✓ Android Studio 3.0+.
- ✓ A LED.
- ✓ A Google/Gmail account.



Image source: <https://www.dreamstime.com>

# Voice Kit



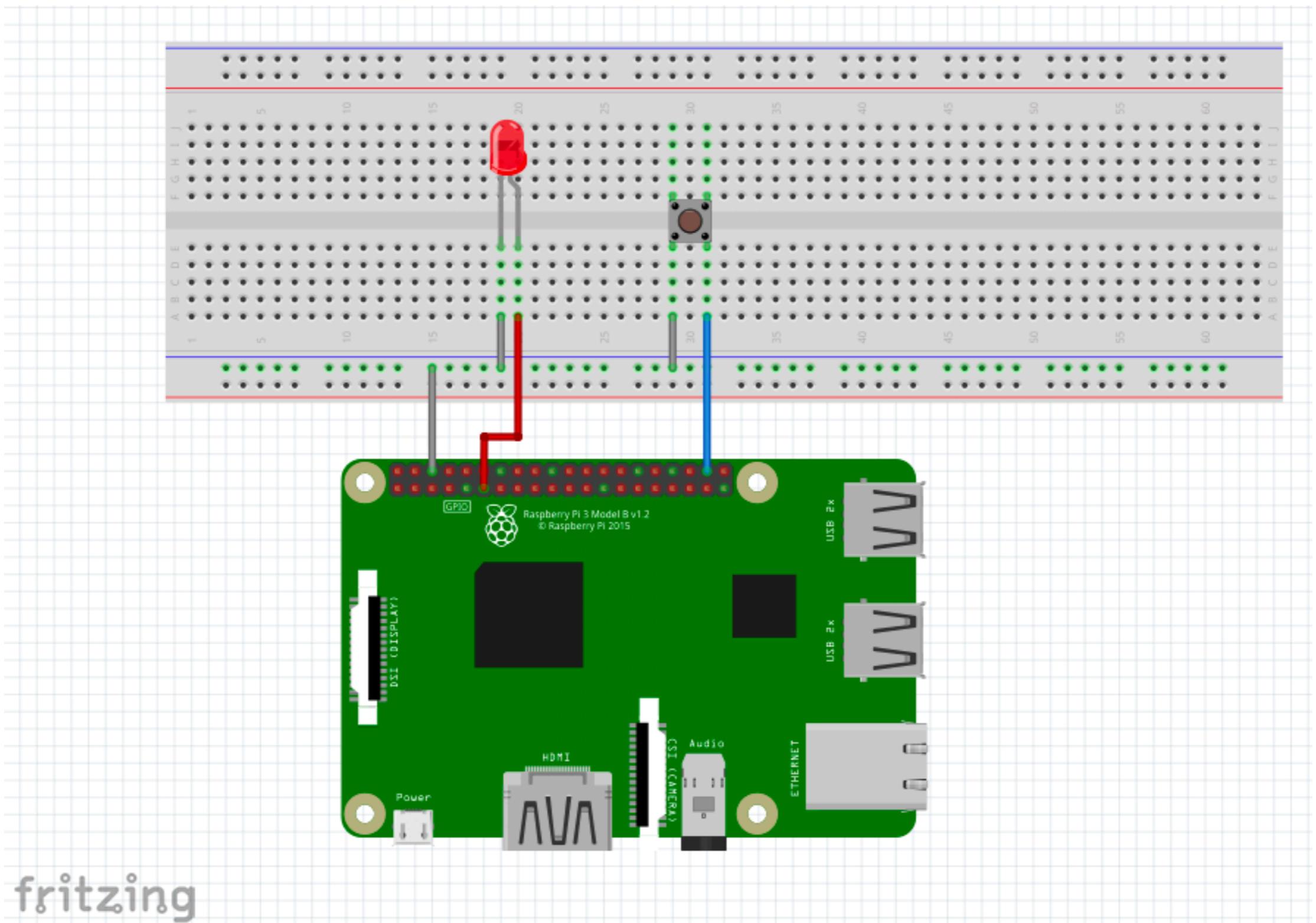
<https://aiyprojects.withgoogle.com/voice/>

# Voice Kit



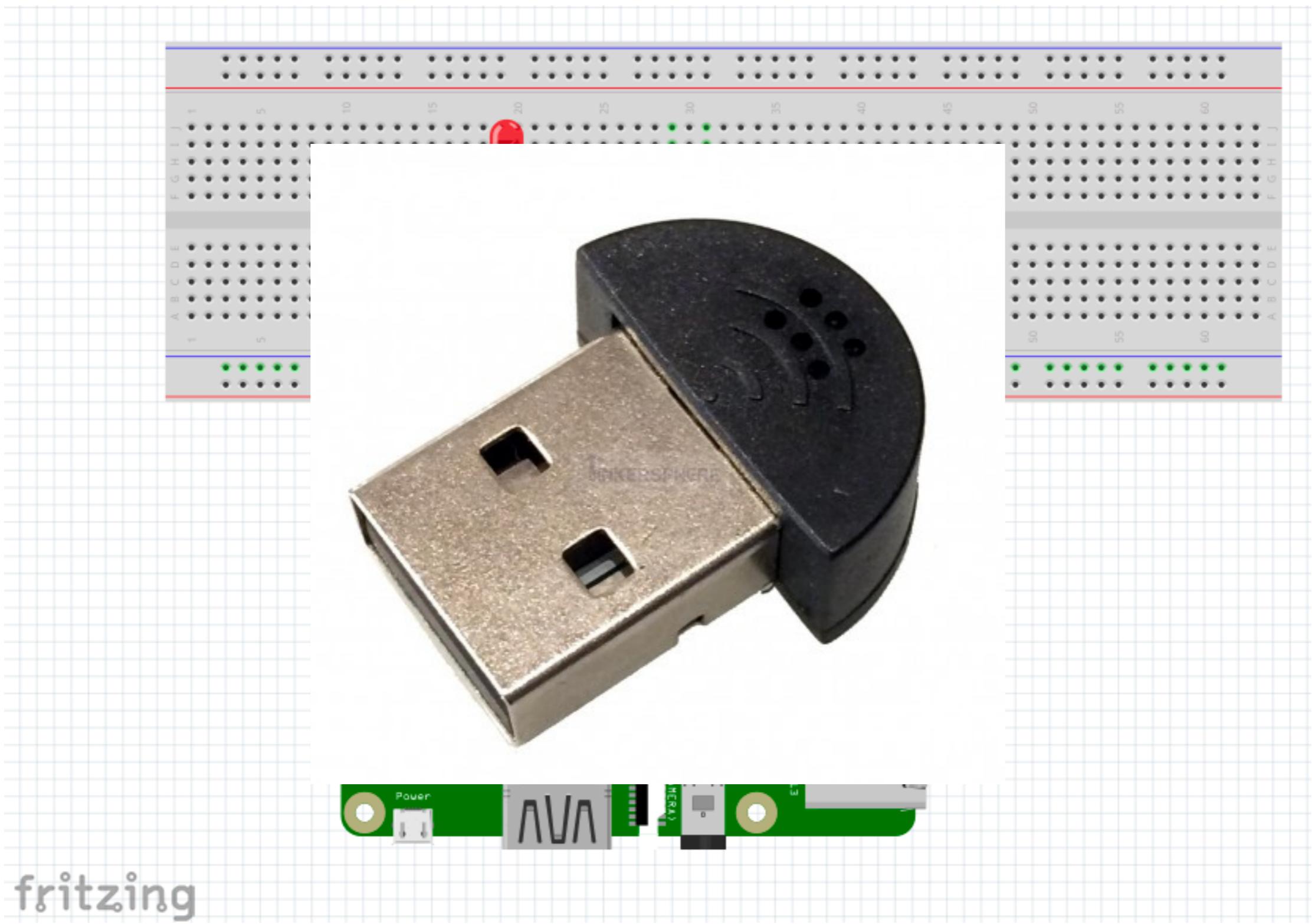
<https://aiyprojects.withgoogle.com/voice/>

# Assemble the Hardware



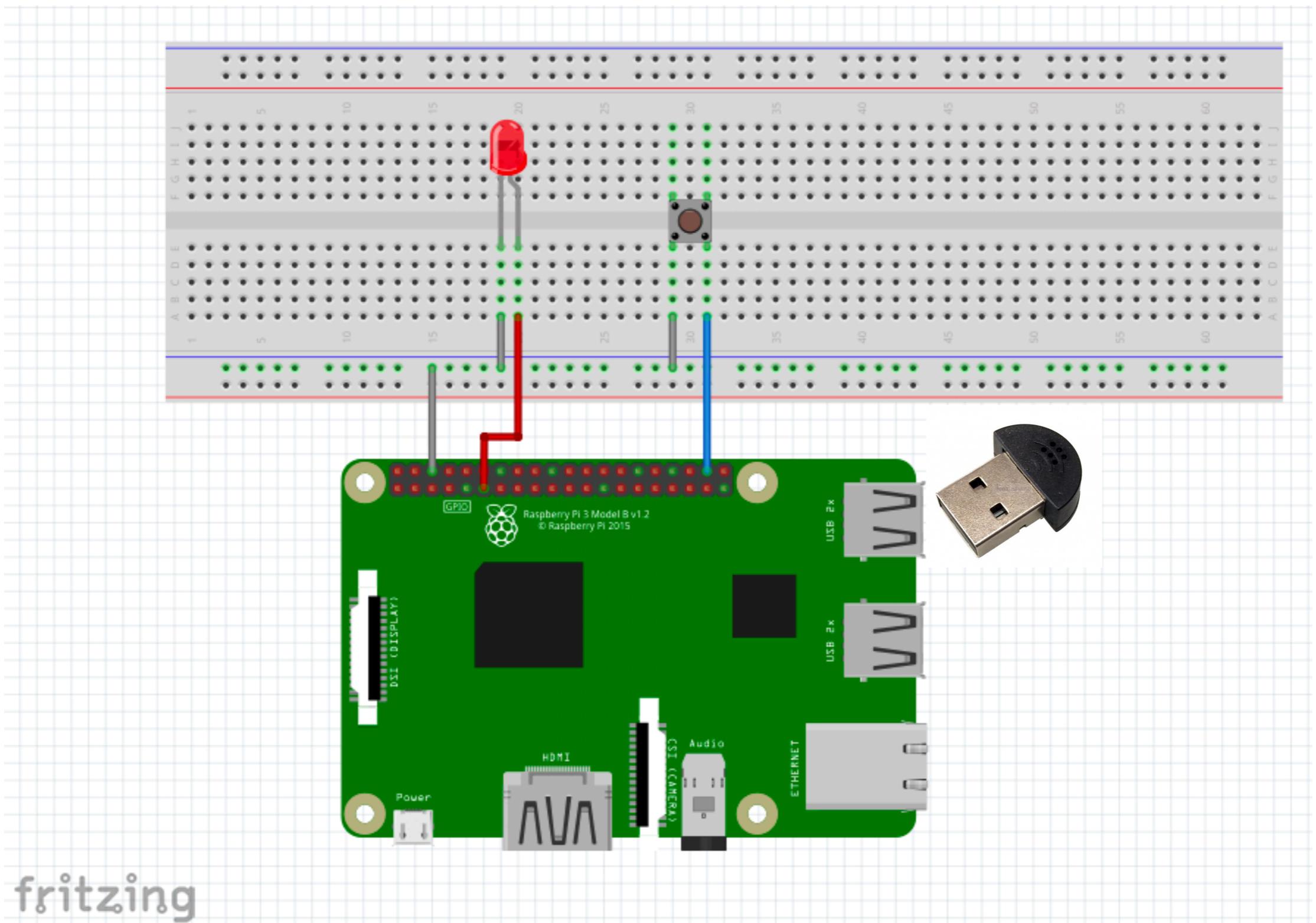
fritzing

# Assemble the Hardware

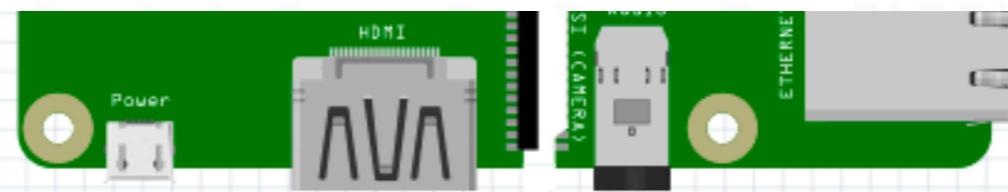


fritzing

# Assemble the Hardware

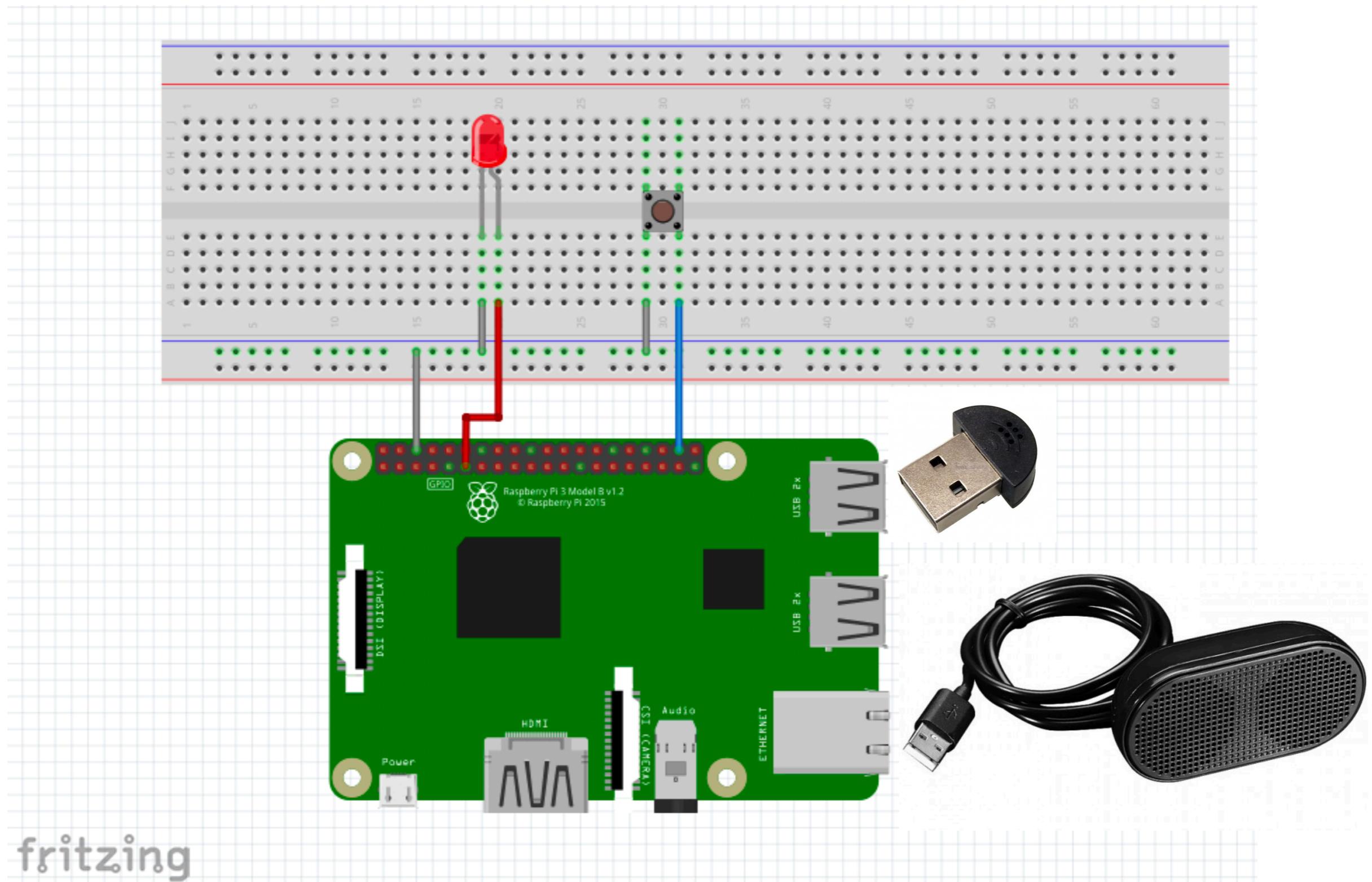


# Assemble the Hardware



fritzing

# Assemble the Hardware

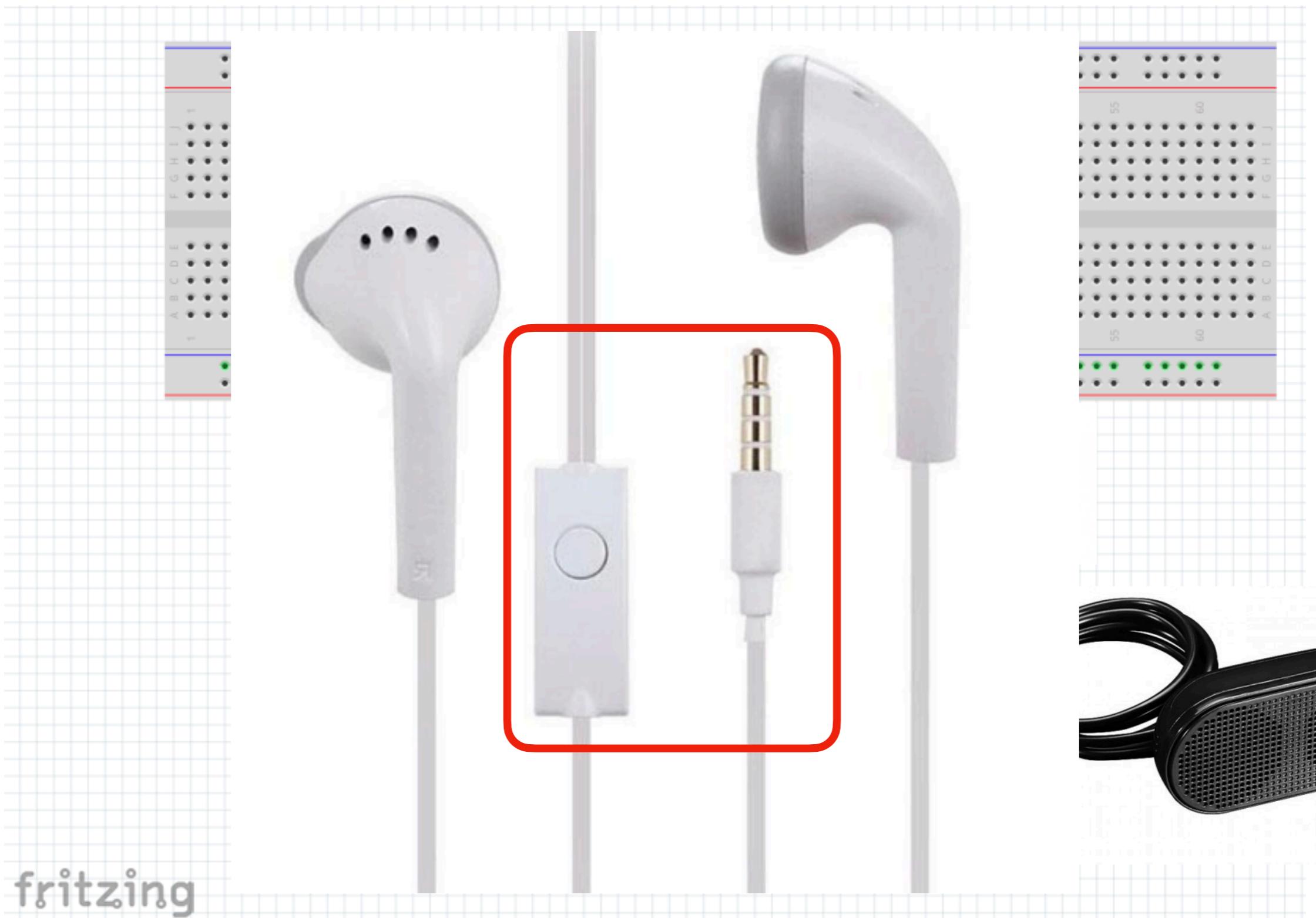


fritzing

# Assemble the Hardware



# Assemble the Hardware



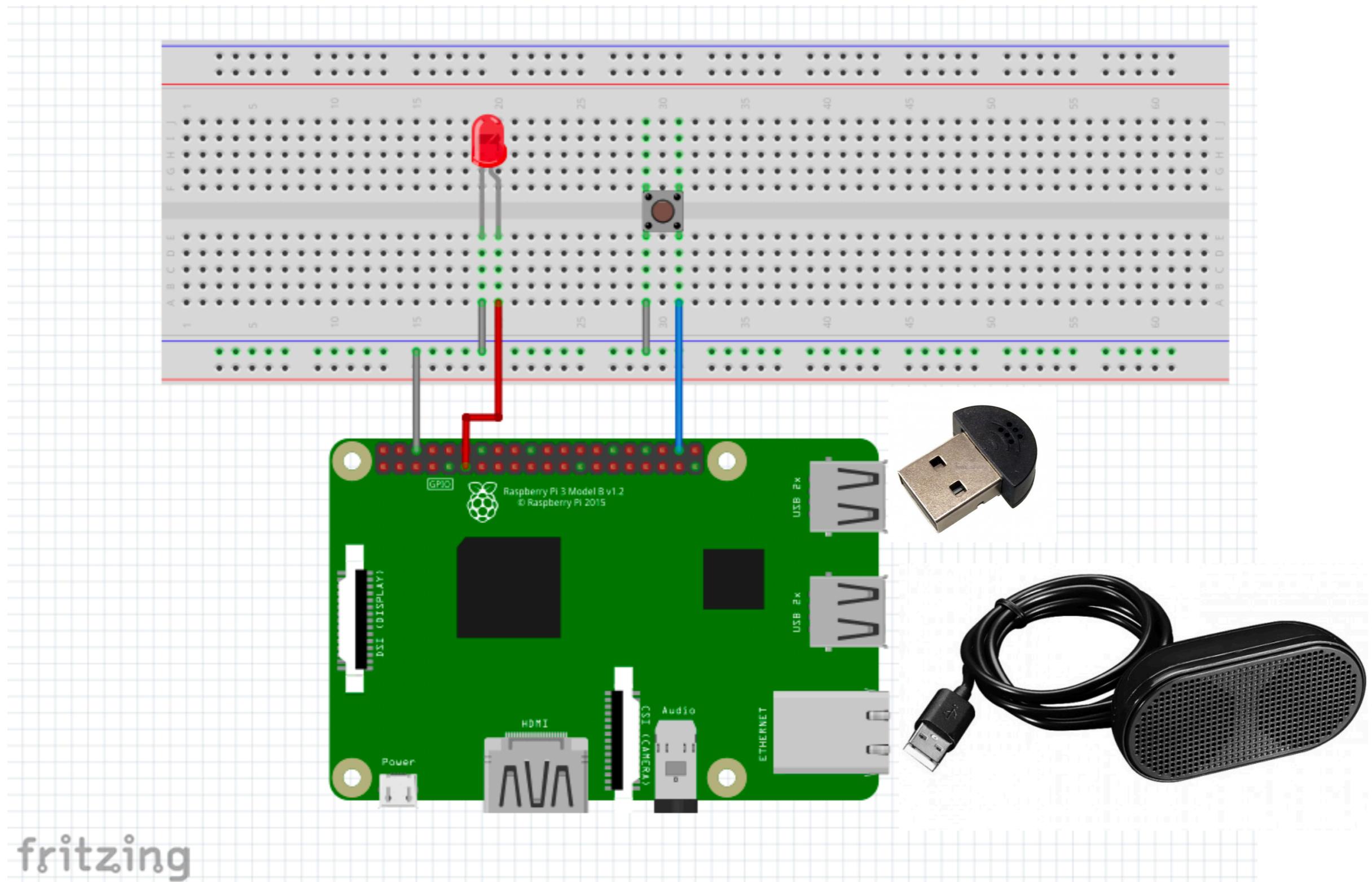
fritzing

# Assemble the Hardware



fritzing

# Assemble the Hardware



fritzing

# Get the Sample Code

 [dancojocar / at](#)

Unwatch ▾ 1 Star 0 Fork 0

Code Issues 0 Pull requests 0 Projects 0 Wiki Insights Settings

Android Things Edit

[Manage topics](#)

11 commits 1 branch 0 releases 1 contributor

Branch: master ▾ New pull request Create new file Upload files Find File Clone or download ▾

 <a href="#">dancojocar</a> Change the colors.	<span>Clone with SSH</span> <a href="#">SSH</a> <a href="#">Use HTTPS</a>
 <a href="#">lectures</a> Change the colors.	Use an SSH key and passphrase from account.
 <a href="#">.gitignore</a> Lecture #3: Add bluetooth sample application.	<code>git@github.com:dancojocar/at.git</code> <span>Copy</span>

[Help people interested in this repository understand your project by adding a README.](#)

Open in Desktop Download ZIP

# Get the Sample Code

Screenshot of a GitHub repository page for `dancojocar / at`.

The repository navigation bar includes:

- `Code` (selected)
- `Issues 0`
- `Pull requests 0`
- `Projects 0`
- `Wiki`
- `Insights`
- `Settings`

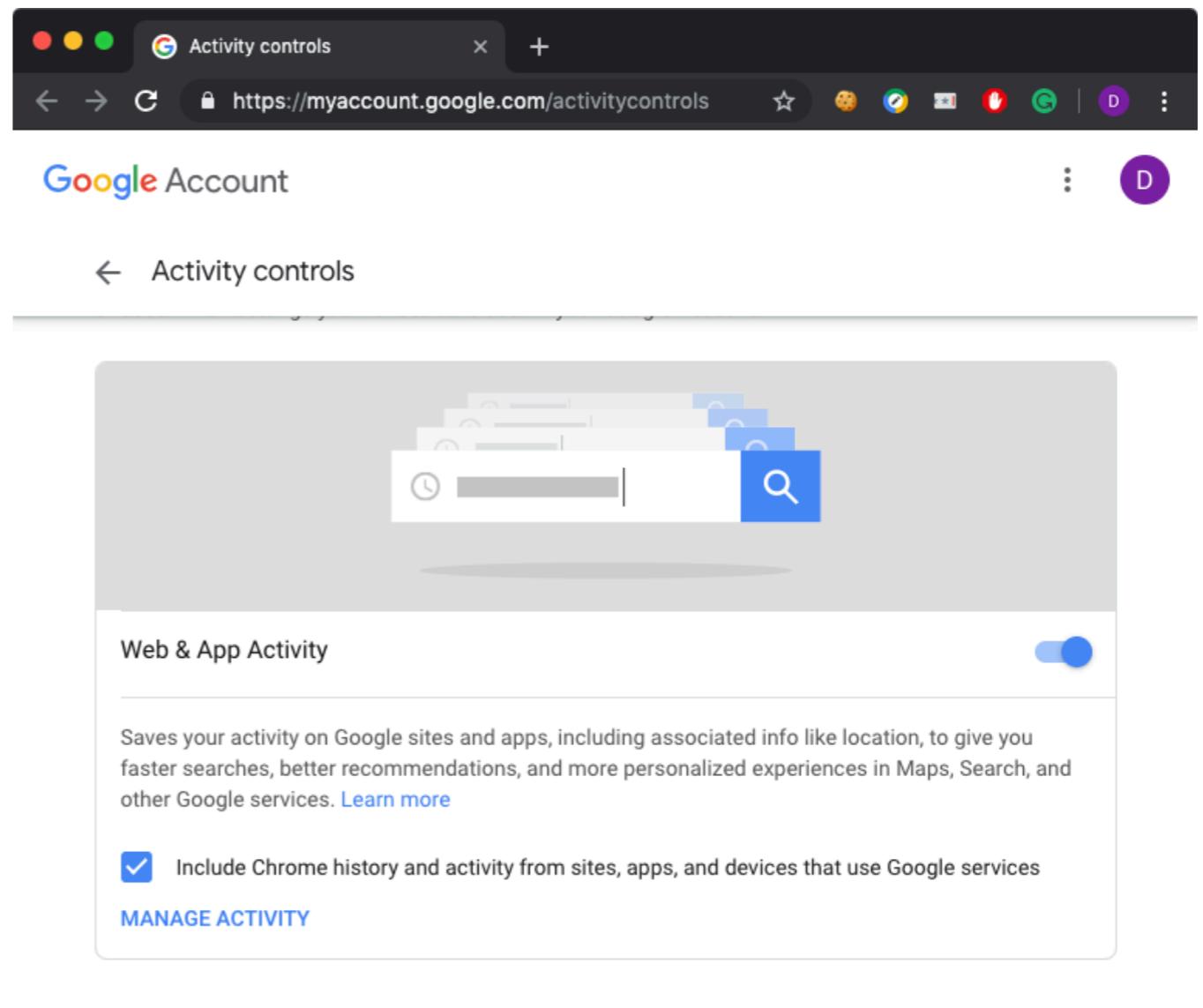
The repository details section shows:

- Branch: `master`
- Latest commit: `80594b5` 23 hours ago by `dancojocar` (Lecture #7)
- File list:
  - `gradle/wrapper` (Lecture #7, 23 hours ago)
  - `shared` (Lecture #7, 23 hours ago)
  - `step1-start-here` (Lecture #7, 23 hours ago)
  - `step2-volume-control` (Lecture #7, 23 hours ago)
  - `step3-built-in-device-actions` (Lecture #7, 23 hours ago)
  - `step4-custom-device-actions` (Lecture #7, 23 hours ago)

# Configure the Credentials

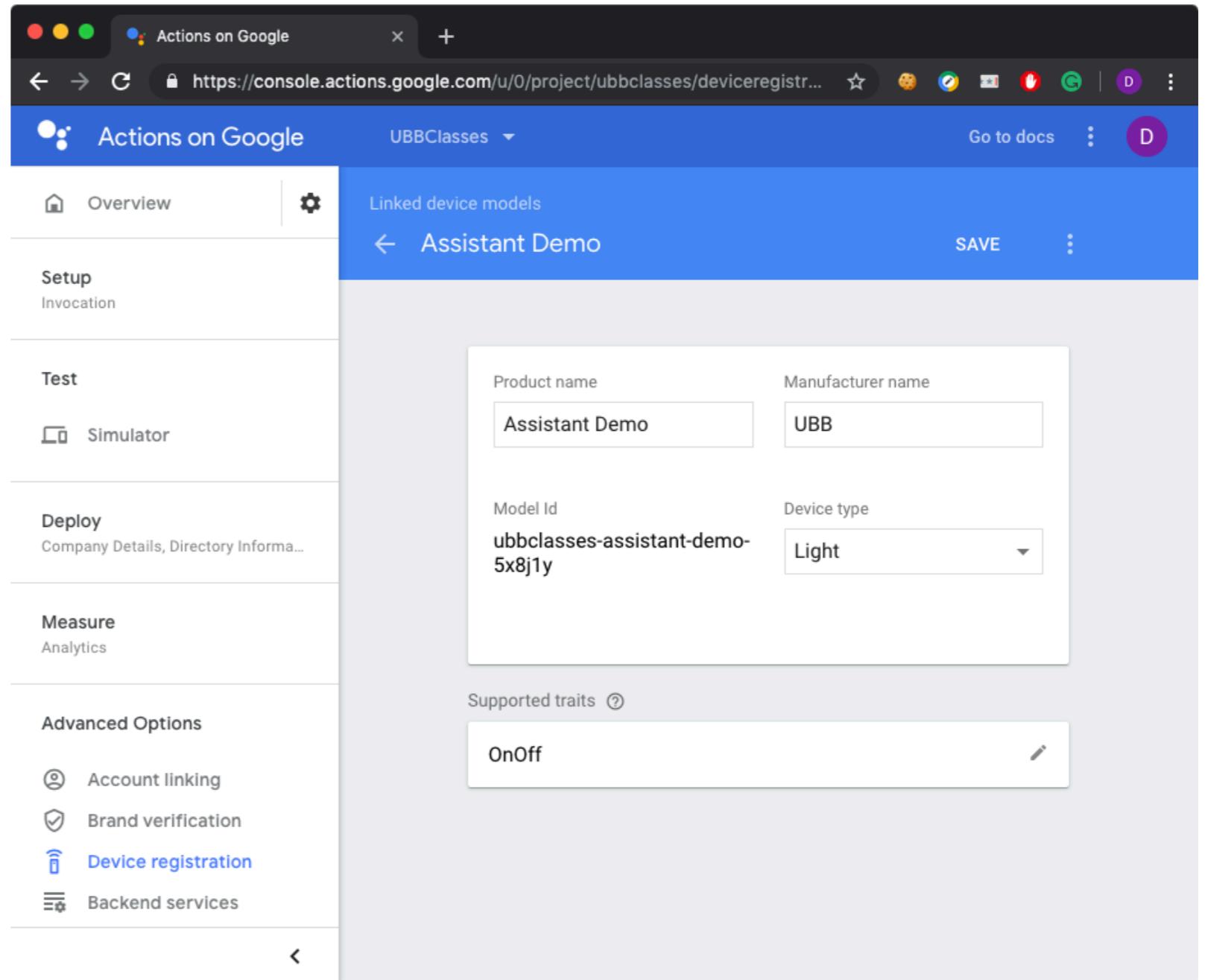
- In Activity controls enable:

- Web & App Activity
- Device Information
- Voice & Audio Activity



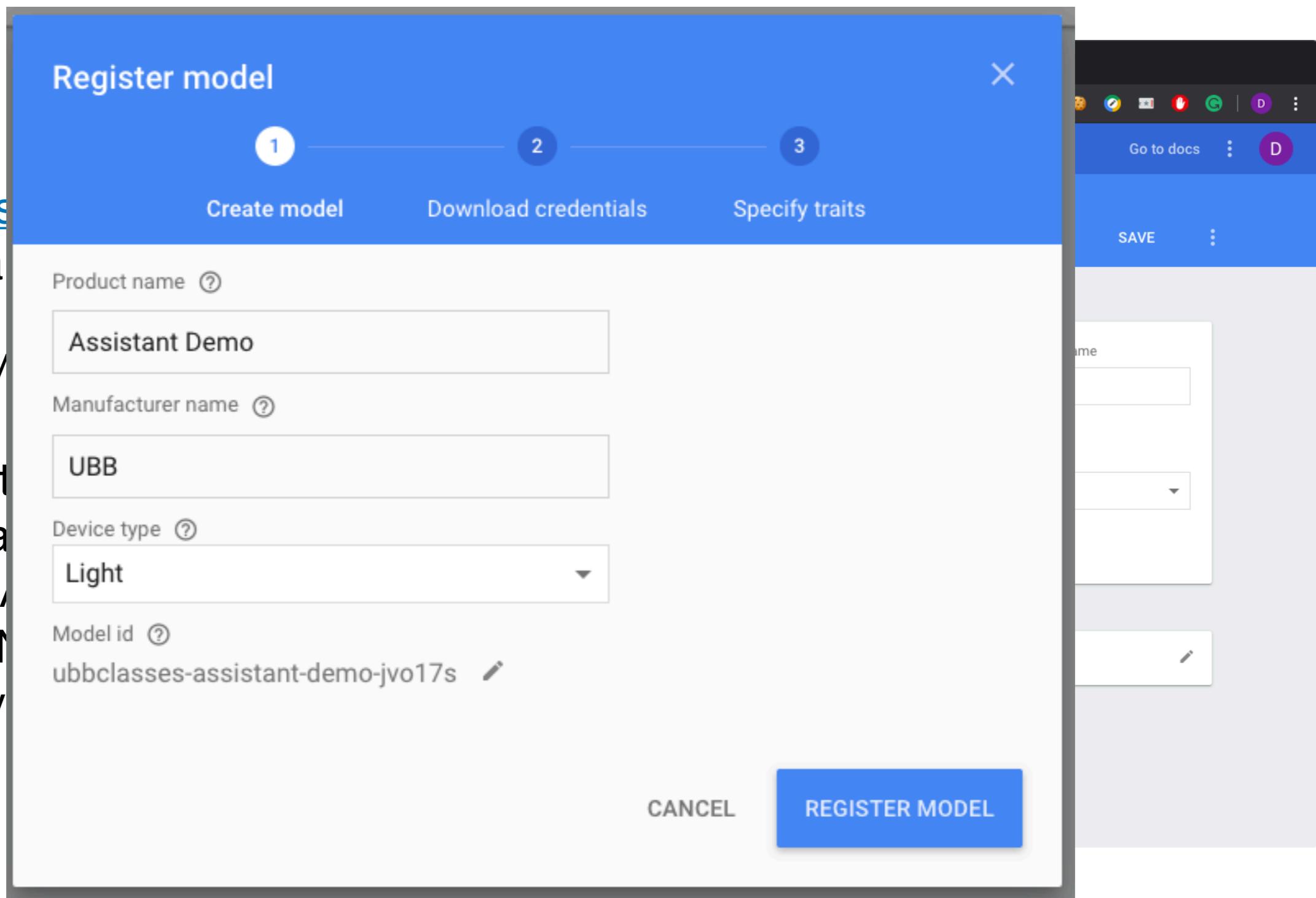
# Configure the Credentials

- In [Actions Console](#) register a device:
  - Create/Use a project.
  - Select the Device registration tab (under ADVANCED OPTIONS) from the left navbar.



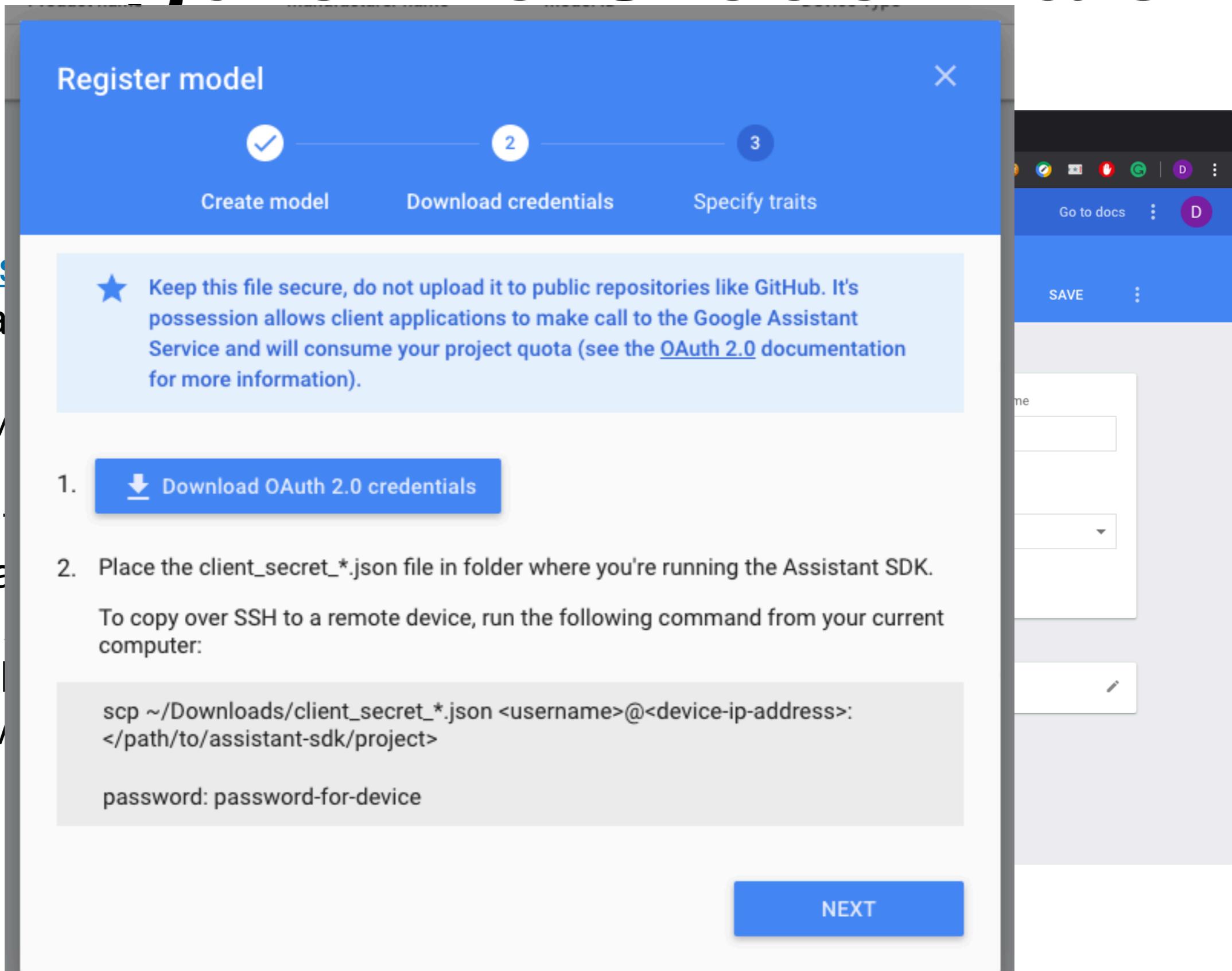
# Configure the Credentials

- In [Actions](#) register a:
  - Create/
  - Select the registration (under **OPTION**) left nav



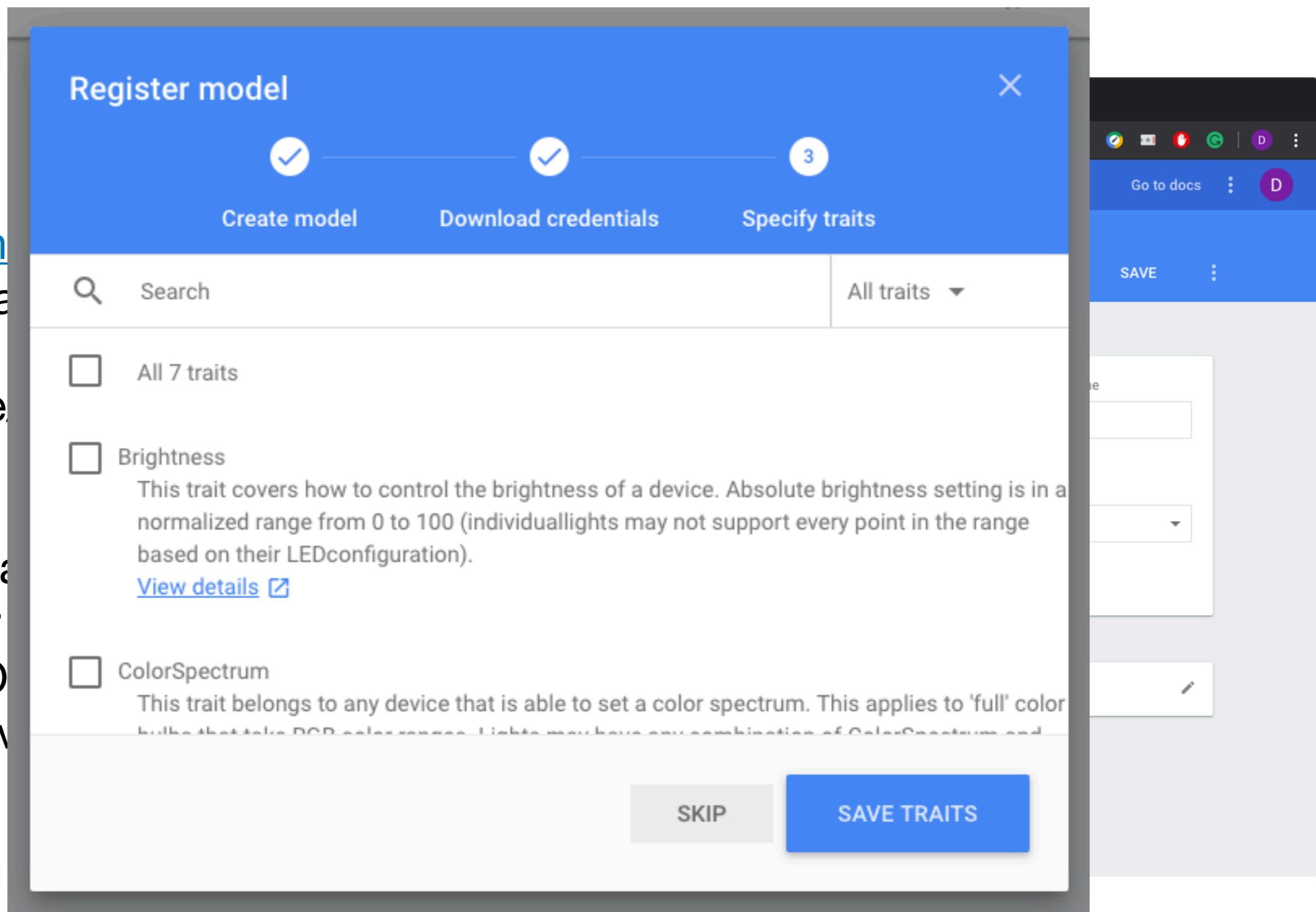
# Configure the Credentials

- In Actions, register a new model:
  - Create a new model
  - Select the registration (under **OPTIONAL**)



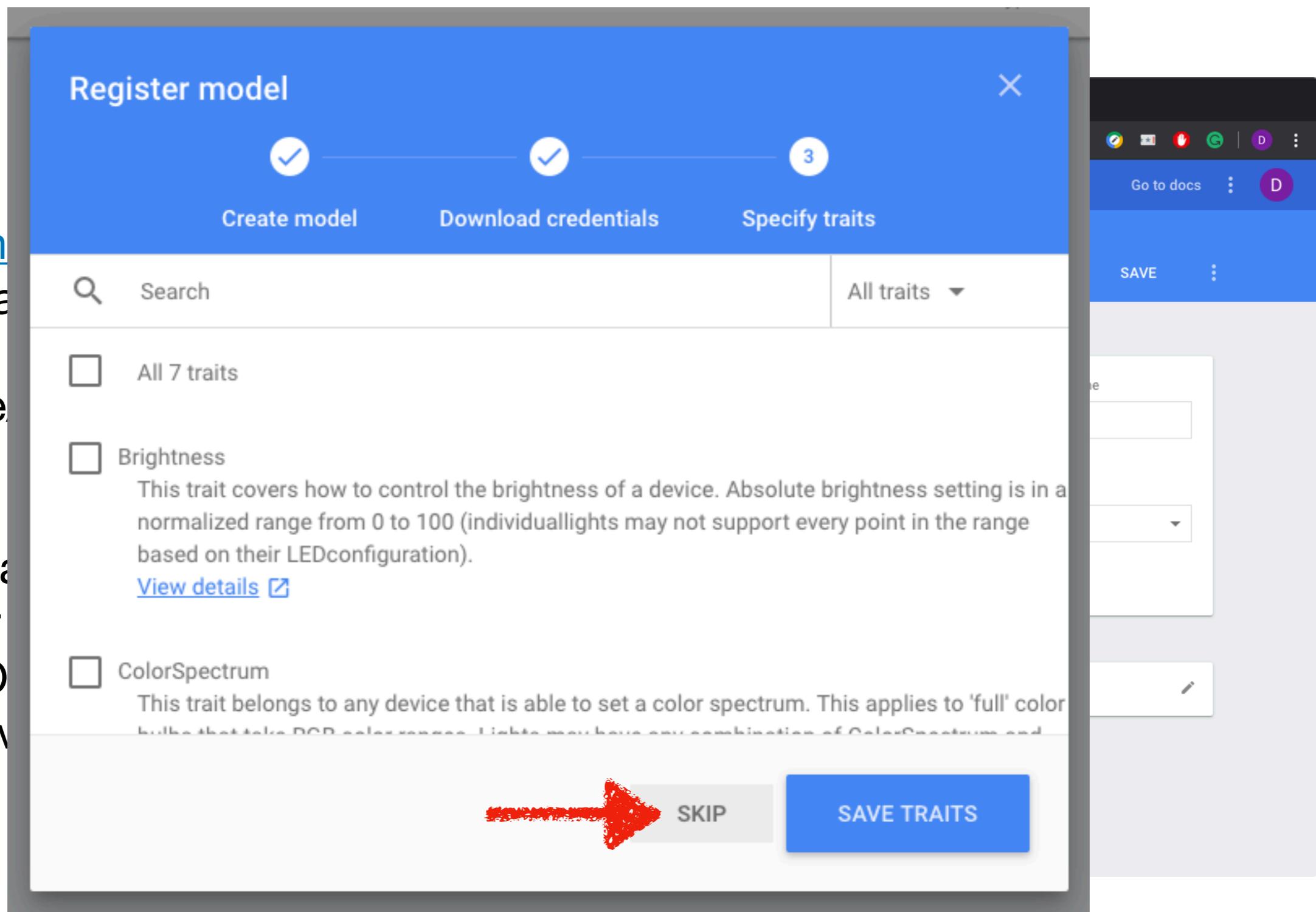
# Configure the Credentials

- In Action register a
- Create
- Select registration (under OPTIONS left nav)



# Configure the Credentials

- In Action register a
- Create
- Select registration (under OPTIONS left nav)



# Enable the Google Assistant API

- Enable [Google Assistant API](#) in the Cloud Console

The screenshot shows the Google Cloud Console interface for the Google Assistant API. The top navigation bar includes the project name "UBBClasses" and the URL "https://console.developers.google.com/apis/api/embeddedassistant.googleapis.com/overview?project=ubbclasses...". The left sidebar lists "APIs & Services" under "Google Assistant API" with options for "Overview", "Metrics", "Quotas", and "Credentials". The main content area has tabs for "Overview", "DISABLE API", and "PROVIDE FEEDBACK". The "Overview" tab is selected, displaying "Details" such as Name (Google Assistant API), By (Google), Service name (embeddedassistant.googleapis.com), and Activation status (Enabled). It also features a "Traffic by response code" chart showing request rates over time, with a significant spike around April 7th. Below the chart, a legend indicates 2xx: 0.004/s, 4xx: 0.001/s, and 5xx: 0. At the bottom, there are links for "Tutorials and documentation" and "Learn more".

# Configure a new Python Virtual Environment

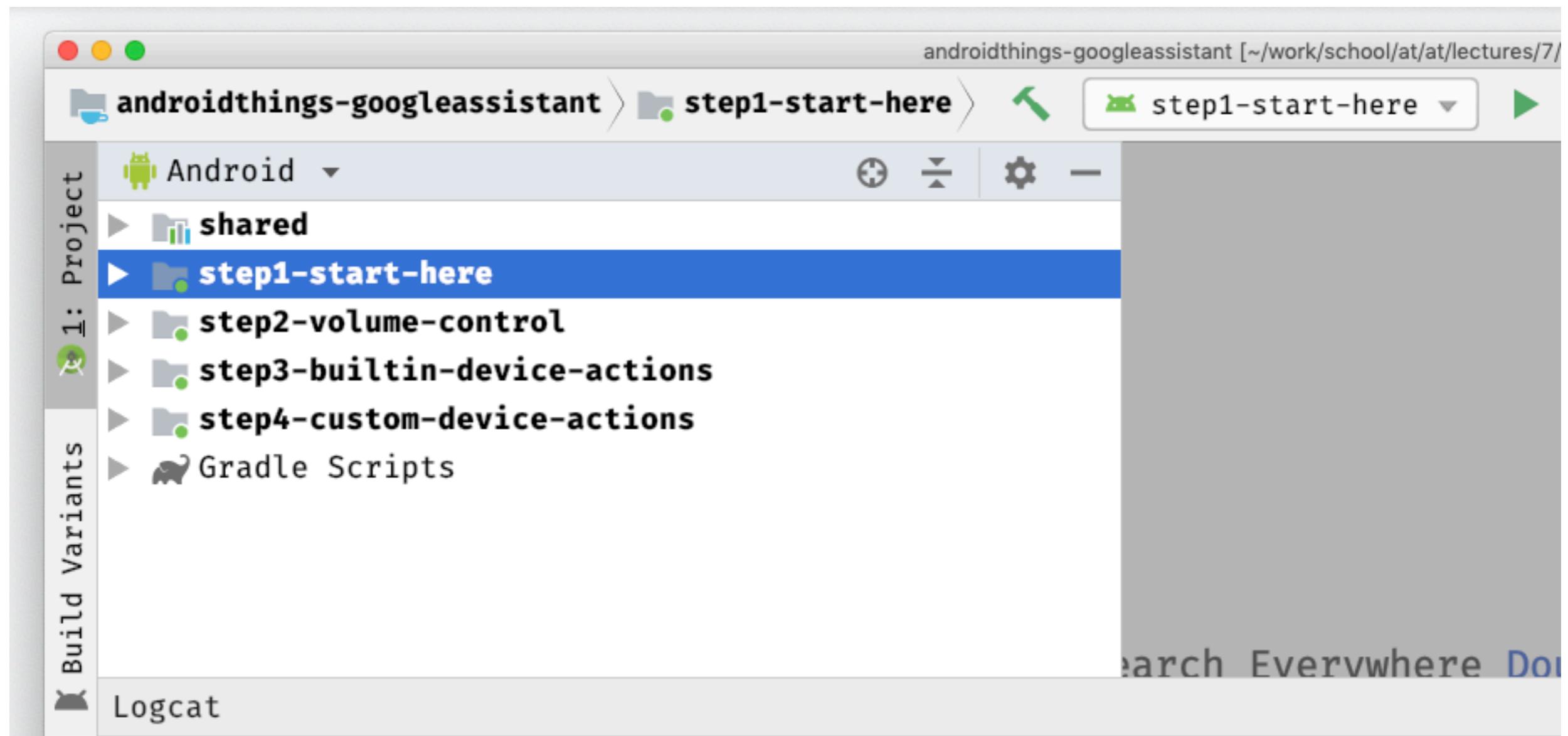
```
$ python3 -m venv env  
$ source env/bin/activate  
(env) $ pip install --upgrade pip setuptools wheel  
(env) $ pip install --upgrade "google-auth-oauthlib[tool]"
```

# Generate the credentials

```
(env) $ google-oauthlib-tool --client-secrets path/to/credentials.json \
--credentials shared/src/main/res/raw/credentials.json \
--scope https://www.googleapis.com/auth/assistant-sdk-prototype \
--save
```

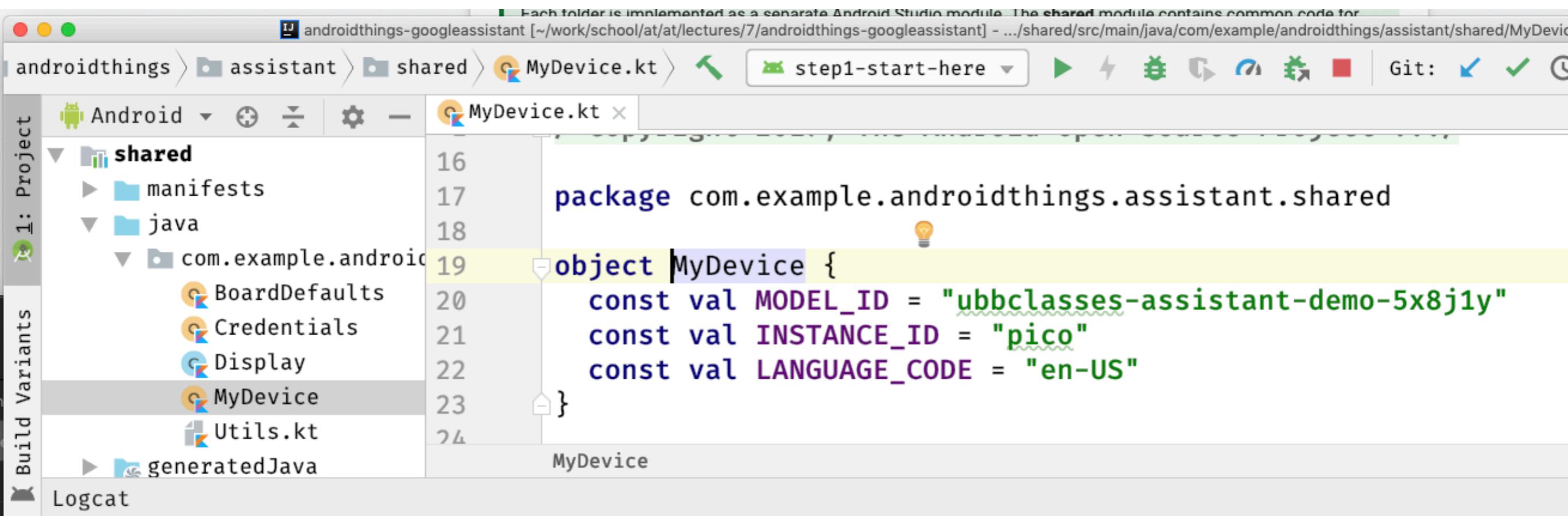
Replace `path/to/credentials.json` with the path of the JSON file you downloaded

# Run the step1-start-here module



DEMO

# Run the step1-start-here module



The screenshot shows the Android Studio interface with the following details:

- Title Bar:** androidthings-googleassistant [~/work/school/at/at/lectures/7/androidthings-googleassistant] - .../shared/src/main/java/com/example/androidthings/assistant/shared/MyDevice.kt
- Toolbar:** Includes icons for back, forward, search, and other common operations.
- Project Navigators:** On the left, there are "Project", "Build Variants", and "Logcat" panes.
- Code Editor:** The main editor pane displays the `MyDevice.kt` file. The code is as follows:

```
16
17 package com.example.androidthings.assistant.shared
18
19 object MyDevice {
20     const val MODEL_ID = "ubbclasses-assistant-demo-5x8j1y"
21     const val INSTANCE_ID = "pico"
22     const val LANGUAGE_CODE = "en-US"
23 }
24
```

The code editor highlights the string constant `MODEL_ID` with a green underline, indicating it is being edited or has been modified.

# Add Built-In Device Actions

## Traits

Select the traits your device supports. [Learn more](#)

Search	All traits ▾
large, these are currently robotic vacuum cleaners, but this would also apply to some drones, delivery robots, and other future devices. <a href="#">View details</a> 	
<input checked="" type="checkbox"/> OnOff	The basic on and off functionality for any device that has binary on and off, including plugs and switches as well as many future devices. Note that thermostats have an expanded 'mode' setting, which is a multiway switch that includes on and off, but thermostats generally will not have this trait. <a href="#">View details</a> 
<input type="checkbox"/> StartStop	This trait covers starting and stopping the device. Starting and stopping a device serves a similar function to turning it on and off. Devices that inherit this trait function differently when turned on and when started. Certain washing machines, for instance, are able to be turned on and have their settings modified before actually starting operation.

You've selected 1 out of 7 traits

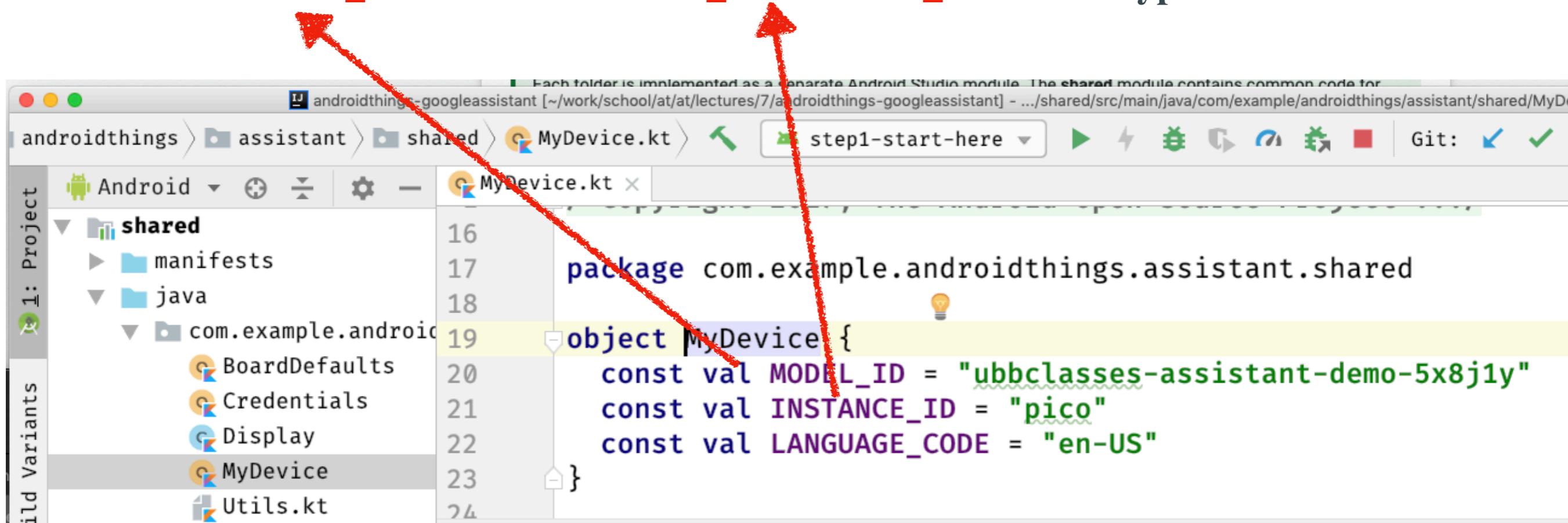
[CANCEL](#) [SAVE](#)

# Register the Device

```
(env) $ google-oauthlib-tool --client-secrets path/to/credentials.json \
--scope https://www.googleapis.com/auth/assistant-sdk-prototype \
--save
(env) $ pip install google-assistant-sdk
(env) $ googlesamples-assistant-devicetool --project-id PROJECT_ID list --model
...
(env) $ googlesamples-assistant-devicetool --project-id PROJECT_ID register-device \
--model MODEL_ID --device DEVICE_INSTANCE_ID --client-type SERVICE
```

# Register the Device

```
(env) $ google-oauthlib-tool --client-secrets path/to/credentials.json \
--scope https://www.googleapis.com/auth/assistant-sdk-prototype \
--save
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...  
(env) $ googlesamples-assistant-devicetool --project-id PROJECT_ID register-device \  
--model MODEL_ID --device DEVICE_INSTANCE_ID --client-type SERVICE
```



# Add Custom Device Actions

```
{  
  "manifest": {  
    "displayName": "Display",  
    "invocationName": "Display",  
    "category": "PRODUCTIVITY"  
  },  
  "actions": [  
    {  
      "name": "com.example.actions.Display",  
      "availability": {  
        "deviceClasses": [  
          {  
            "assistantSdkDevice": {}  
          }  
        ]  
      },  
      "intent": {  
        "name": "com.example.intents.Display",  
        "parameters": [  
          {  
            "name": "Display",  
            "type": "string",  
            "description": "The display to show."  
          }  
        ]  
      }  
    }  
  ]  
}
```

```
{
  "name": "com.example.actions.Display",
  "availability": {
    "deviceClasses": [
      {
        "assistantSdkDevice": {}
      }
    ]
  },
  "intent": {
    "name": "com.example.intents.Display",
    "parameters": [
      {
        "name": "number",
        "type": "SchemaOrg_Number"
      }
    ],
    "trigger": {
      "queryPatterns": [
        "display $SchemaOrg_Number:number"
      ]
    }
  }
}
```

```
},  
  "fulfillment": {  
    "staticFulfillment": {  
      "templatedResponse": {  
        "items": [  
          {  
            "simpleResponse": {  
              "textToSpeech": "Displaying $number"  
            }  
          },  
          {  
            "deviceExecution": {  
              "command": "com.example.commands.Display",  
              "params": {  
                "number": "$number"  
              }  
            }  
          }  
        ]  
      }  
    }  
  }  
}
```

(env) \$ gactions test --action\_package actions.json --project project\_id

**DEMO**

(env) \$ gactions test --action\_package actions.json --project project\_id

# Lecture outcomes

- Integrate Google Assistant.
- Define custom actions.

