

# TESSEL

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*Programming microcontrollers with node.js*

# WHAT IS THE TESSEL?

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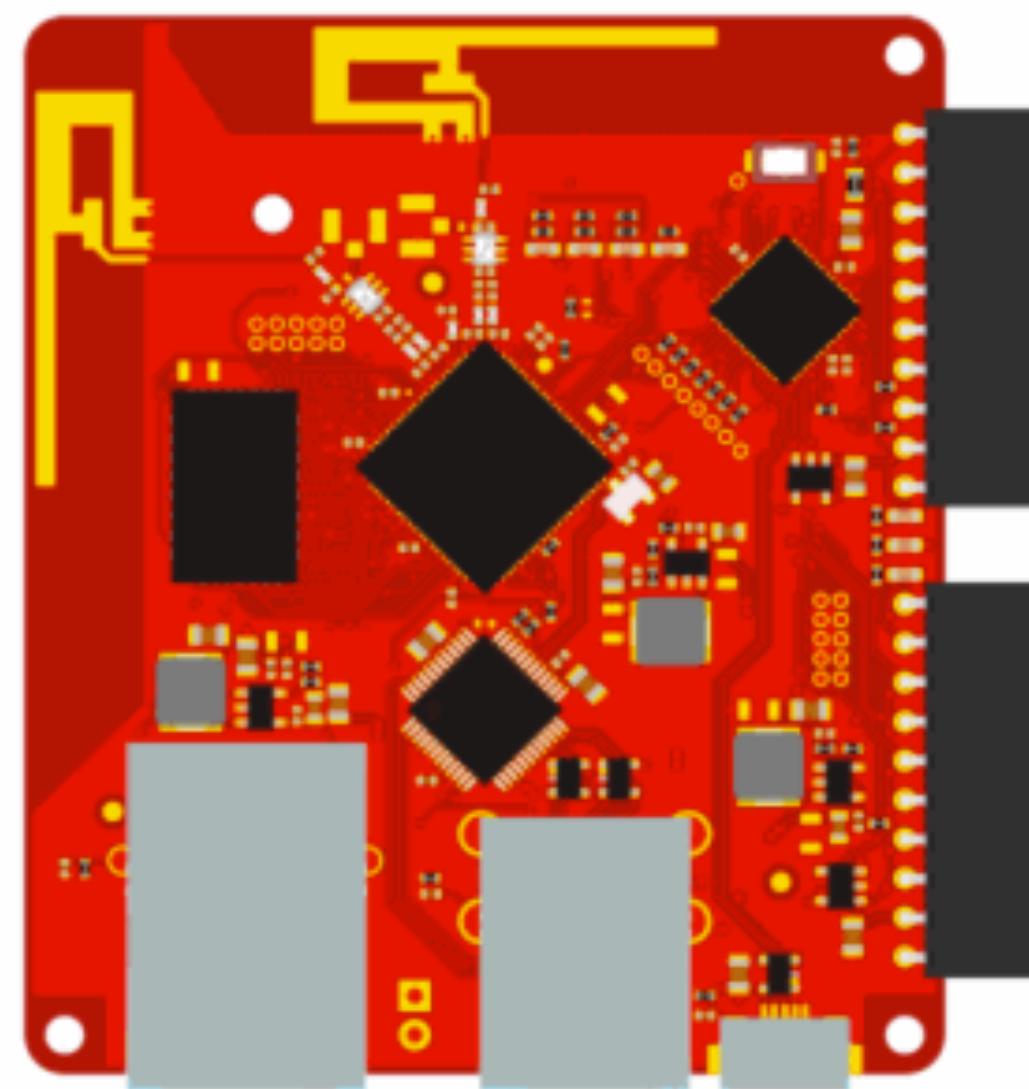
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- **Multi-purpose microcontroller that runs node.js natively.**
- **Comes with a number of modules with various functionalities.**
- **Allows for the building of programs that interface with the real world.**



## TESSEL 2 FEATURES

### EVERYTHING YOU NEED TO GET UP AND RUNNING.

#### 2 Tessel Module ports

add sensors and actuators in one step

#### 2 USB ports

use peripherals like cameras and 3G/4G dongles

#### 802.11bgn Wifi

connected out of the box and wirelessly programmable

#### Ethernet

an ultra-reliable, wired connection

#### 580MHz Mediatek MT7620n

execute your program faster

#### 64 MB DDR2 RAM & 32 MB Flash

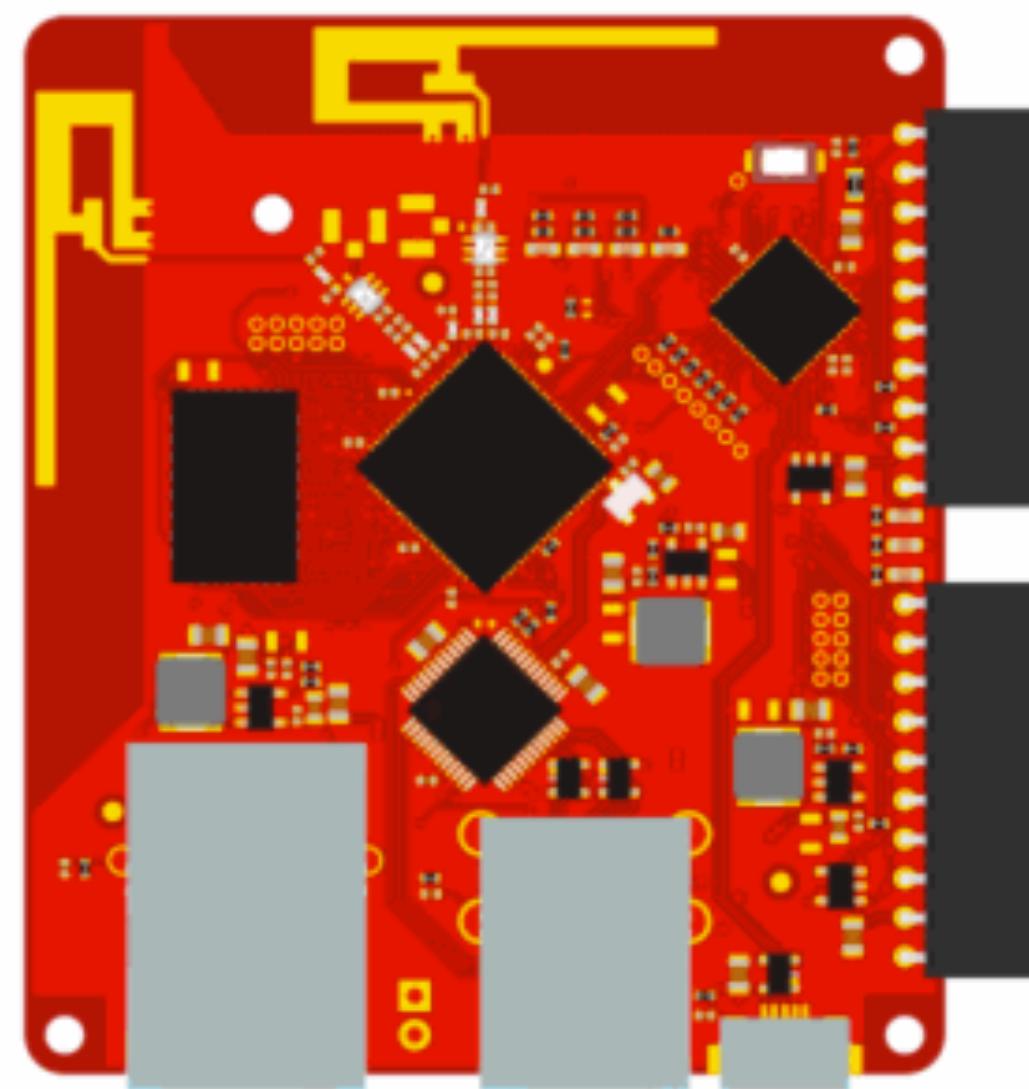
plenty of space for your code

#### 48MHz Atmel SAMD21 coprocessor

realtime I/O and better power management

#### microUSB

power and tethered programming



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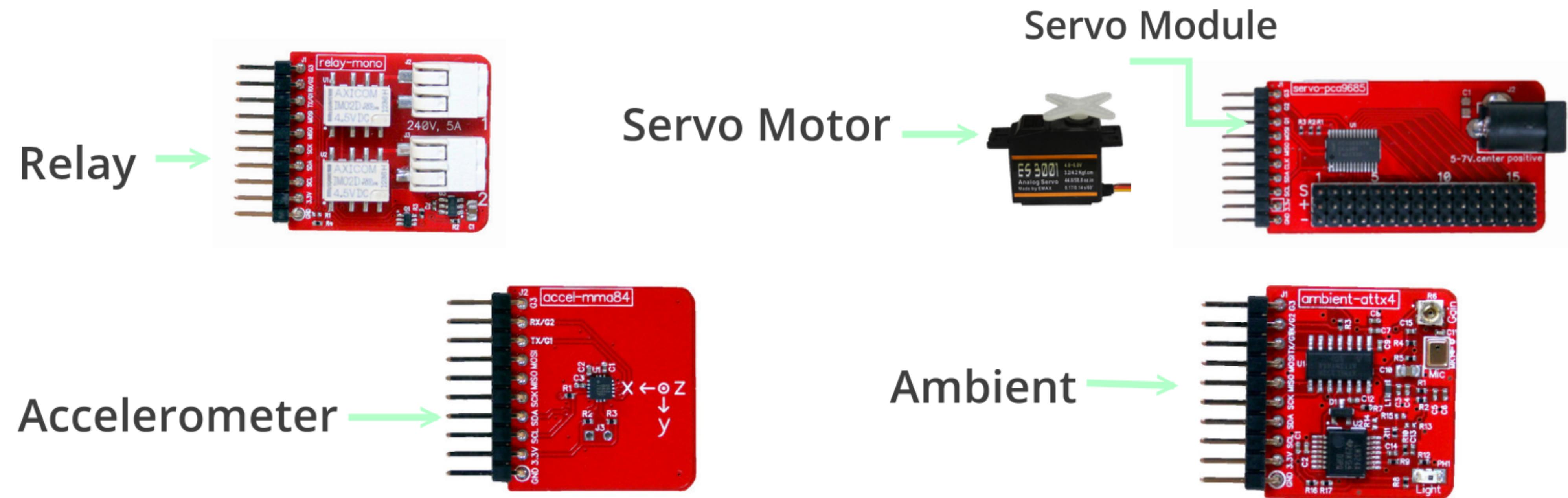
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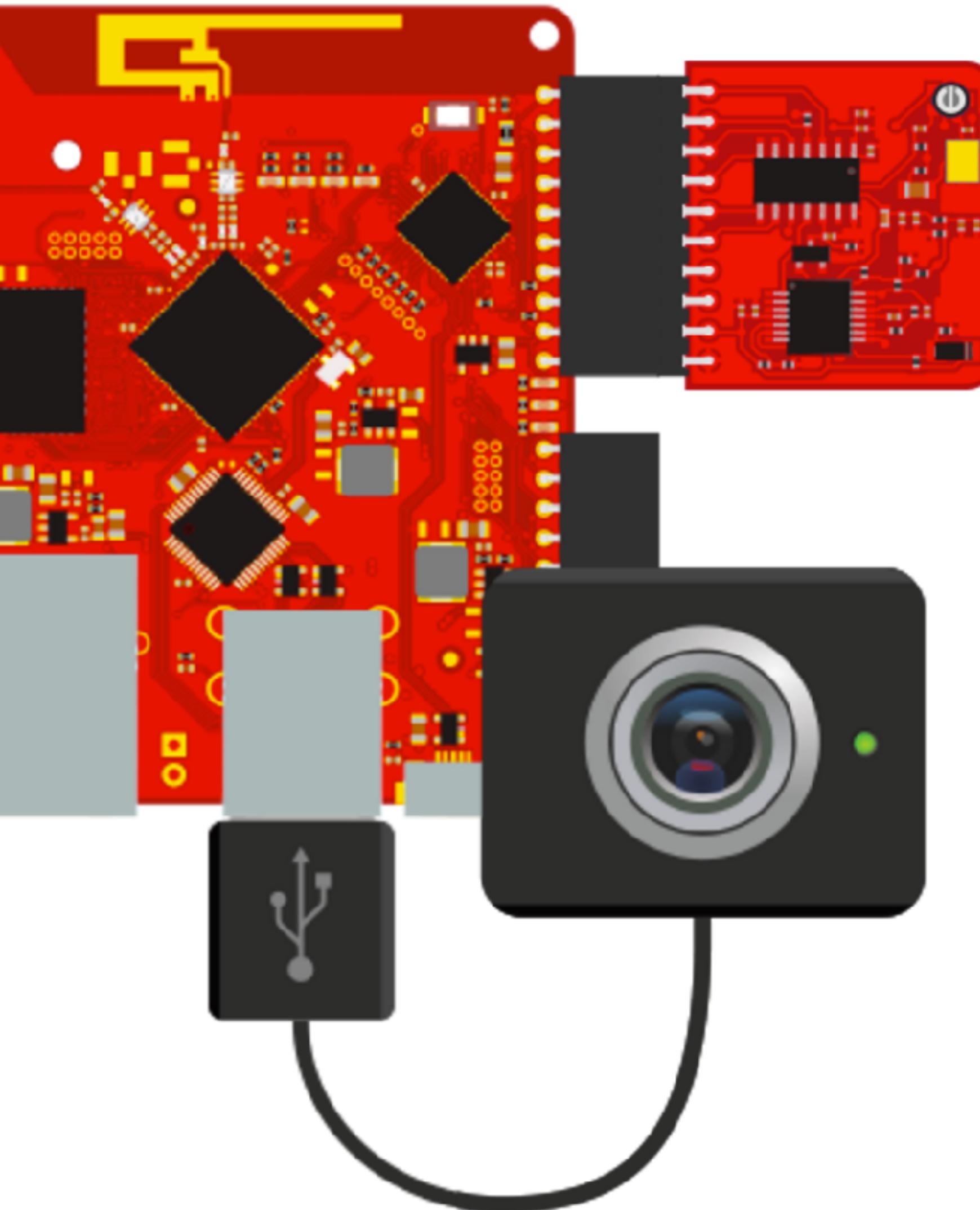
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JavaScript

Python

Rust

```
/* ambient-camera.js example */
// this example records video from a camera
// when a certain sound level is reached
var tessel = require('tessel');
var http = require('http');
// set up camera
var cameralib = require('camera-usb');
// set up ambient sensor on port A
var ambient = require('ambient-attx4').use(tessel.port['A']);

// set a sound trigger
ambient.setSoundTrigger(0.6);

cameralib.find(function(camera) {
  // stream some video when sound is sensed
  ambient.on('sound-trigger', function(){
    var req = http.request({
      hostname: 'example.com',
      port: 80,
      path: '/video'
    });
    req.end();
  });
});
```





# Building a Sleep Tracker for Your Dog Using Tessel and Twilio



## YOLOGRAM!!!!!!

**YOLOGRAM** is a super amped up script that crushes a rocking yogram when you yolo your tessel into the air. It then tweets your image on the @tesseltweet account. [Sample Twitter](#)

...  
...

Project Title

Filter by modules:

 Accelerometer

 Ambient

 Audio

 BluetoothLE

 Camera

 Climate

 GPS

 GPRS

 Infrared

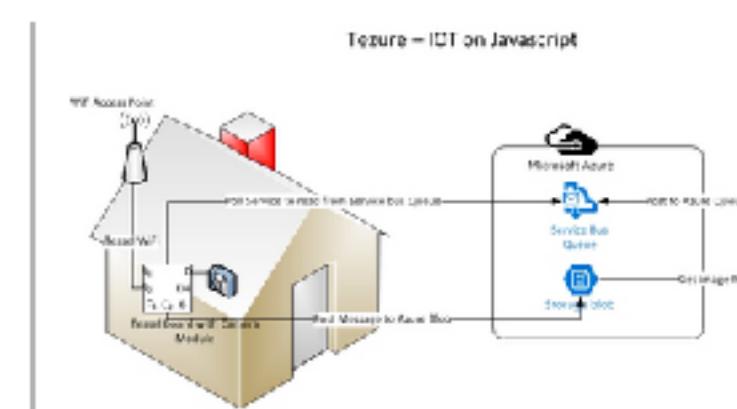
 MicroSD

 nRF24

 Relay

 RFID

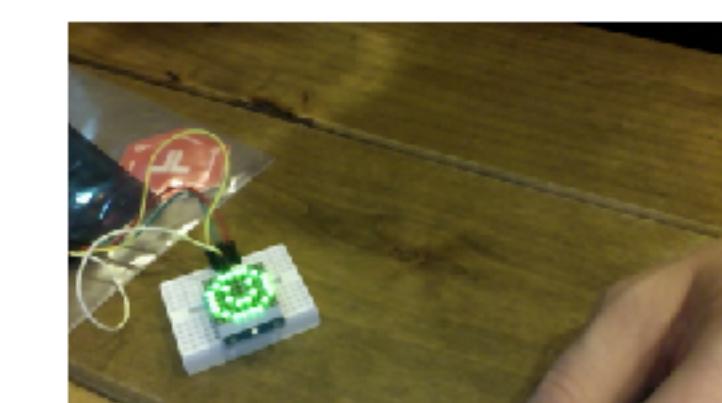
 Servo



### Tezur Spycam

spbreed

276 views



### backpack-ht16k33

adkron

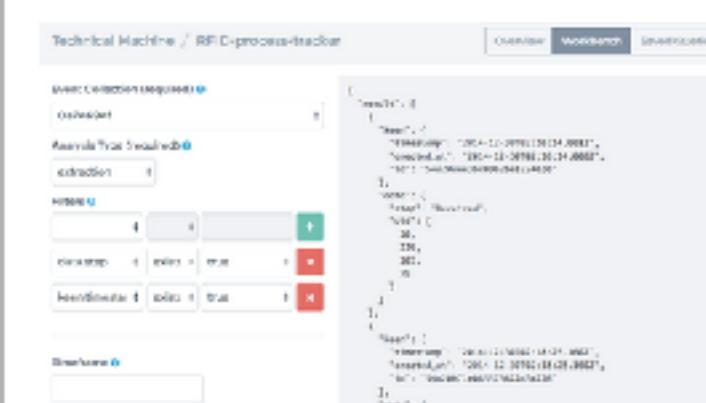
214 views



### Coffee Profile

adkron

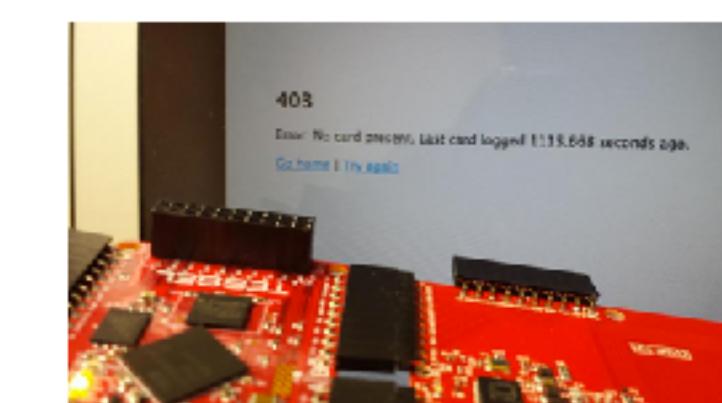
770 views



### RFID Process Tracker

ifoundthemeaningoflife

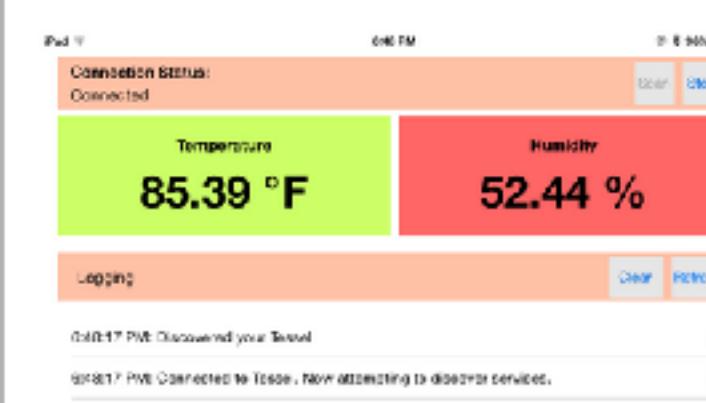
827 views



### RFID Webapp Authorization

ifoundthemeaningoflife

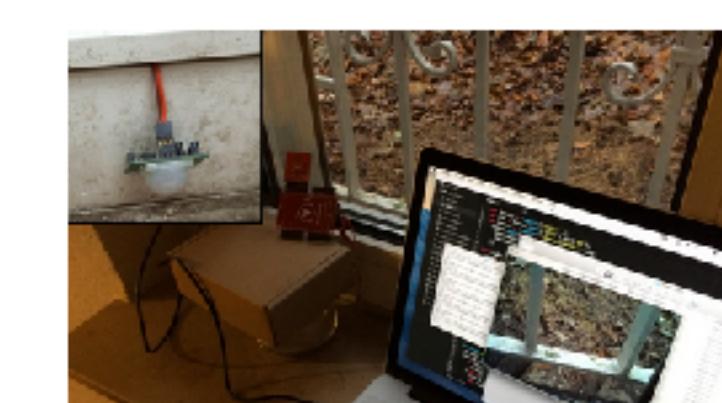
571 views



### iOS App with Climate + BLE Module integration

rbobbins

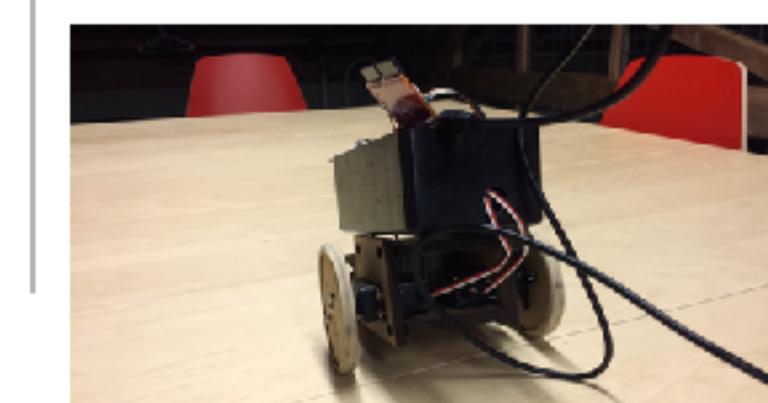
713 views



### phototrap with PIR

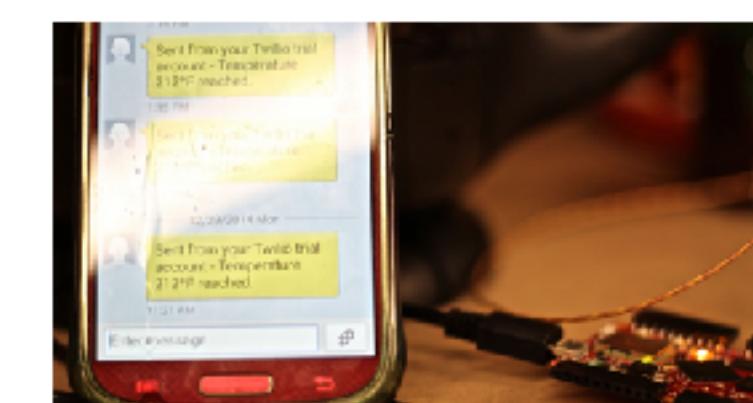
nikolalbibo

664 views



Devices in view:

208.85.197.81.249.244  
56.121.22.46.120.184  
105.105.60.123.235.203 Myo



### "Hot Enough" Text

ifoundthemeaningoflife

1039 views



### Sound-Reactive "Flinching" Robot

ifoundthemeaningoflife

346 views



# TESSEL HACK DAY

- All participants will be broken into competing teams.
- Each team is assigned a fellow as a project manager.
- Each team is given a pre-packaged assortment of modules – think Iron Chef.
- With given modules (civilized bartering is acceptable), produce the coolest project of the day!

# MOST INTERACTIVE

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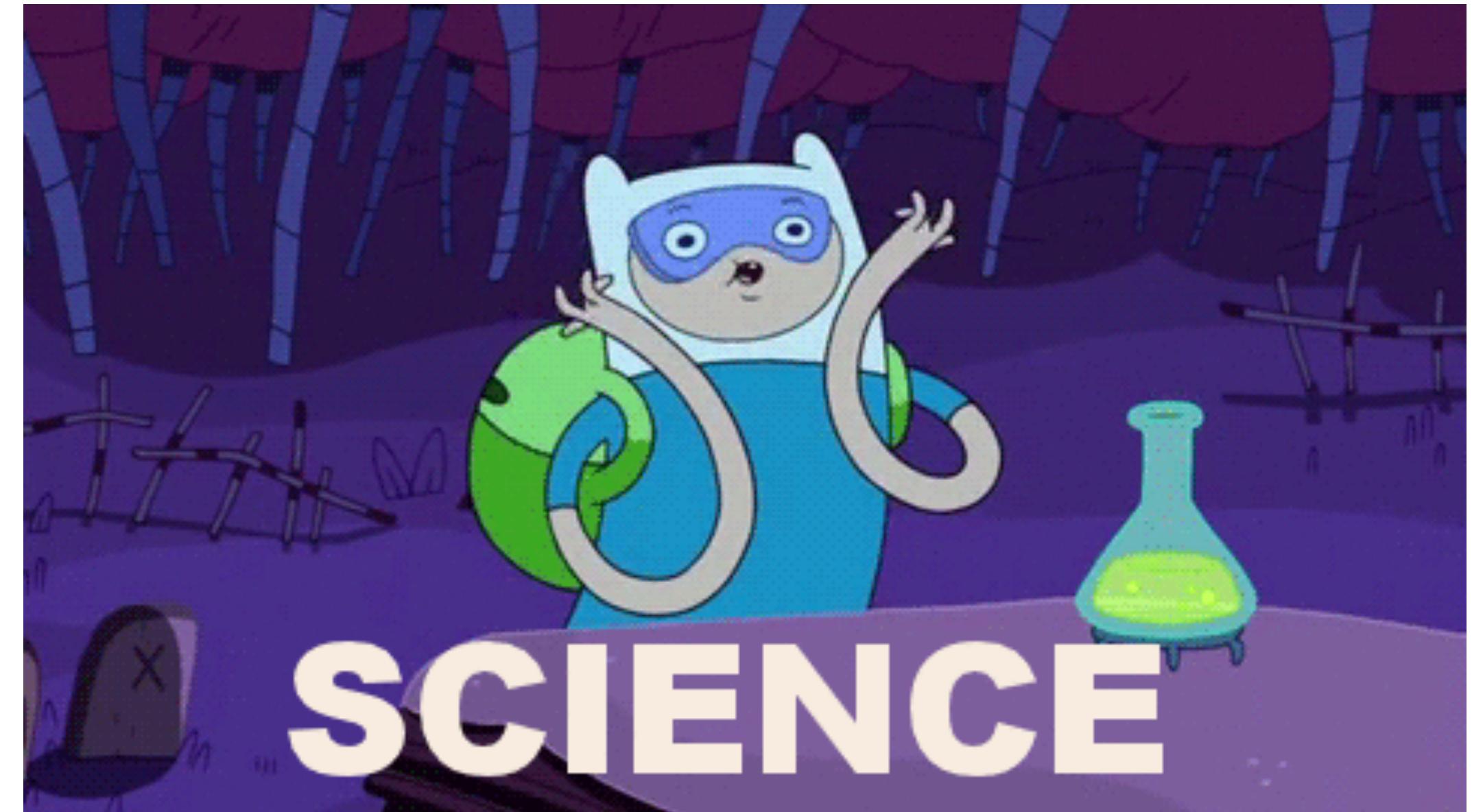
*Project that displays amazing ways  
Javascript can interact with the real  
world*



# HIGHEST CREATIVE CHARGE

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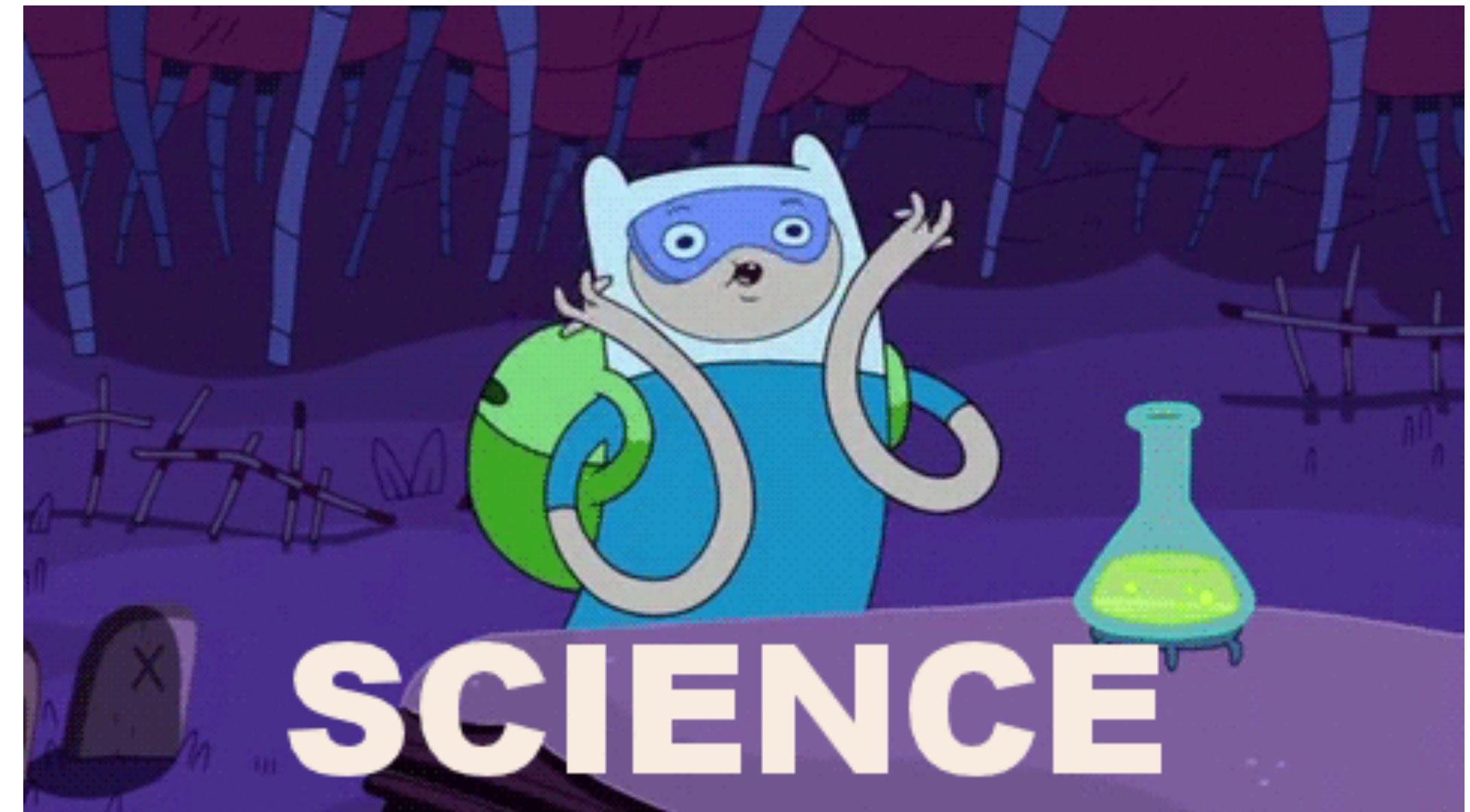
*Most novel solution to a problem  
nobody knew about, especially if no  
problem existed in the first place*



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# BEST CAMPUS SOLUTION

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*Awesome project that solves a problem specifically for the Fullstack or Grace Hopper campuses*



# LET'S CODE!

# WORKING WITH THE TESSEL

- We're not sure how much computing muscle it has!
- To be safe, try to offload as much to other processes on the network as possible.
- Limit node libraries (like Express, etc) as much as possible

# WORKING WITH THE TESSEL (CONTINUED)

- Don't bother doing the “provision” stuff that you may find online.
- Internet not working? Do the power cycle dance.
- Try a different network.
  - 5G networks are not compatible
- Still spotty? Consider running a hotspot on a phone.

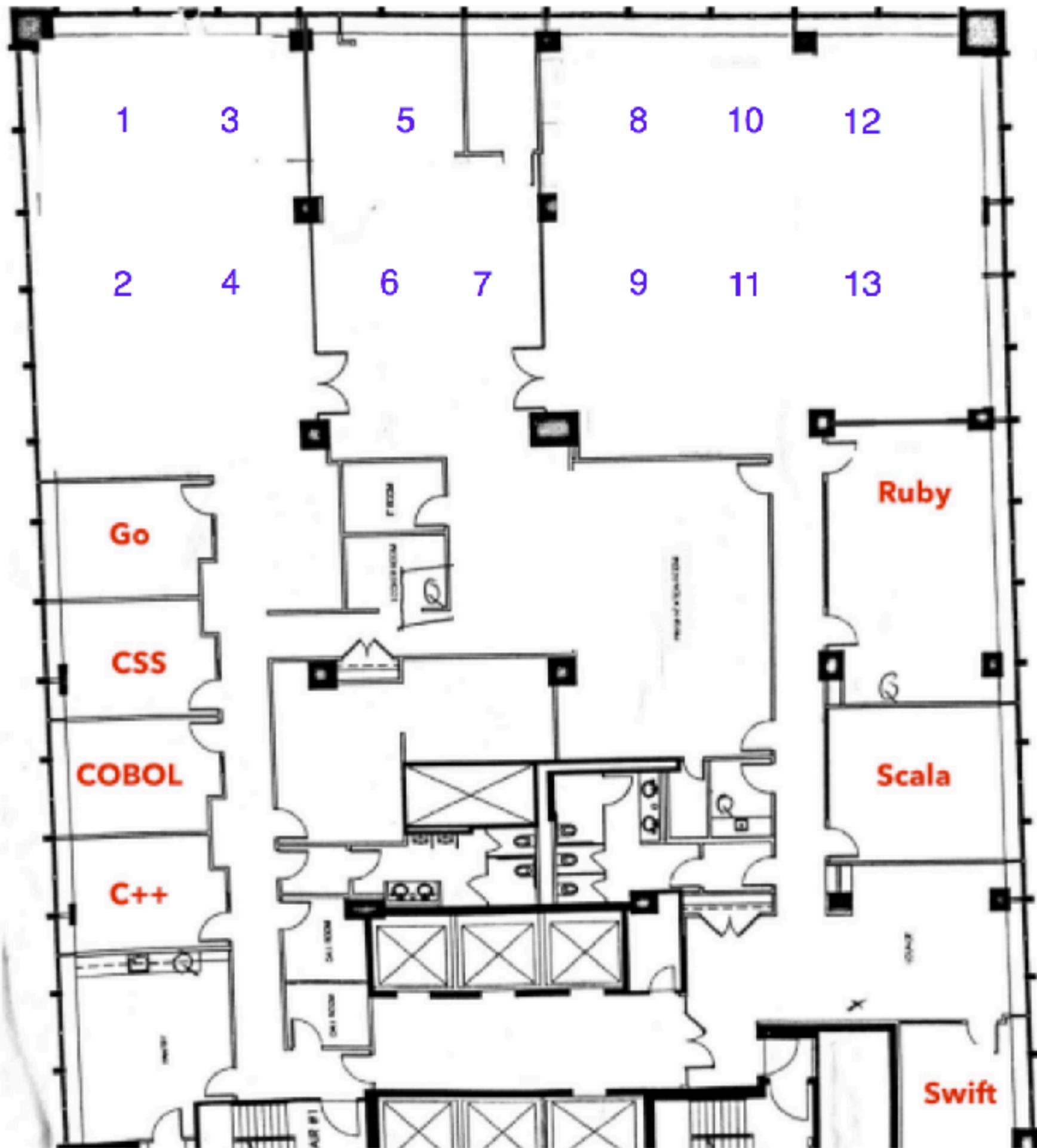
# WORKING WITH YOUR TEAM

- **Problem:** Only 1 Tessel to a team of 3-4 people.
  
- **Solutions:**
  - Divide the work!
  - Pair/mob program.
  - Ask your fellow for guidance.

# WORKING ON THE CAMPUS

- Try to keep your work clean from the get-go, please!
- Use your assigned area and respect the space!
- When you are done, put all the pieces of your Tessel back into the brown bag!

# TIMELINE



- Now: Introduction and Getting Started Walkthrough
- 2:30PM - 5:00PM — Hacking!
- 5:15PM — Present to judges!
- 6:00PM — Awards!