

# CSCI 3308: **smartOBD.**

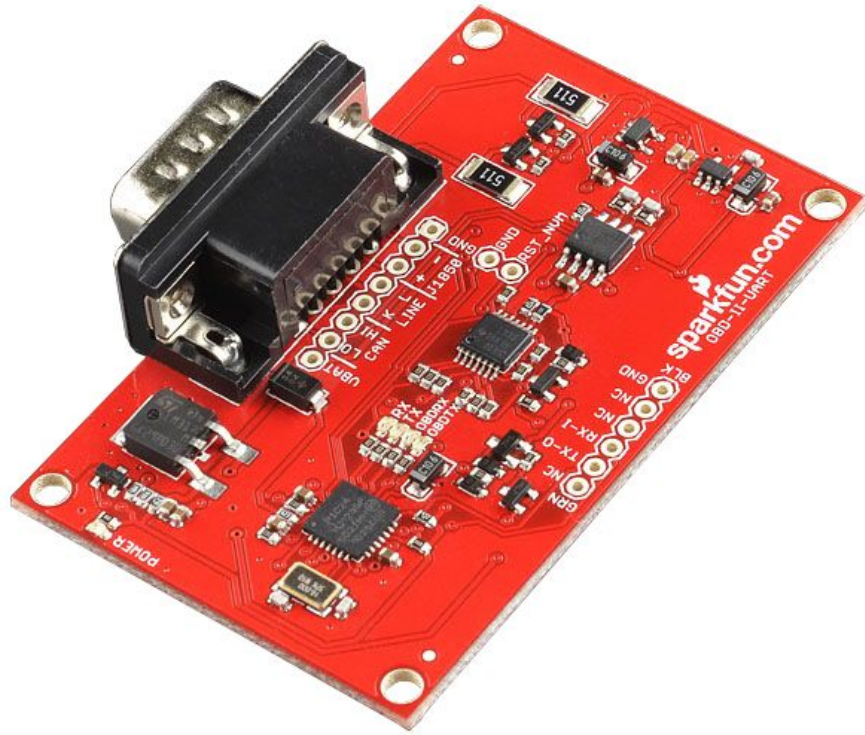
Team 2:  
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# OBD-II





- Cheap
- Customizable
- Ease of access and use

# Vision Statement

For automotive tinkers who need a flexible OBD-II scanner for **unique use cases**. The smartOBD is an OBD-II scanner that is **customizable** and **open source**.

# Features

Welcome! walkerwg

smartOBD.

[Sign Up](#) [Log Out](#)



[Home](#) [Full Data Log](#) [Live data](#) [Export Mechanic Report](#) [Downloads](#)

## Car Overview

### Choose Car:

[See different car's Overview!](#)

### Scanning Summary:

Last checked: 2019-11-19 15:35:05.85197

Distance traveled since codes cleared: -0.00390625 Km

Number of warm-ups since codes cleared: 82 Times

### Temperatures:


 Coolant Temp: 88 C


 Ambient Temp: 7.0588235294117645 C

 Intake Air Temp: 44 C

### Pressures:

 Intake Manifold Pressure: 35 kp

 Evaporative system vapor pressure:  
416.20000000000005 kp

 Barometric Pressure:  
111111101101000000001000000000 kp

# Process

1. Python script of OBD commands: ~200
2. Filling database with car information
3. Create template pug/jade website
4. Add dropdowns/buttons
5. Async, logs, home (NodeJS)
6. Styling pages and images
7. Adding JavaScript Widgets

04	ENGINE_LOAD	Calculated Engine Load	Unit.percent
05	COOLANT_TEMP	Engine Coolant Temperature	Unit.celsius
06	SHORT_FUEL_TRIM_1	Short Term Fuel Trim - Bank 1	Unit.percent
07	LONG_FUEL_TRIM_1	Long Term Fuel Trim - Bank 1	Unit.percent
08	SHORT_FUEL_TRIM_2	Short Term Fuel Trim - Bank 2	Unit.percent
09	LONG_FUEL_TRIM_2	Long Term Fuel Trim - Bank 2	Unit.percent
0A	FUEL_PRESSURE	Fuel Pressure	Unit.kilopascal
0B	INTAKE_PRESSURE	Intake Manifold Pressure	Unit.kilopascal
0C	RPM	Engine RPM	Unit.rpm
0D	SPEED	Vehicle Speed	Unit.kph
0E	TIMING_ADVANCE	Timing Advance	Unit.degree
0F	INTAKE_TEMP	Intake Air Temp	Unit.celsius
10	MAF	Air Flow Rate (MAF)	Unit.grams_per_second
11	THROTTLE_POS	Throttle Position	Unit.percent
12	AIR_STATUS	Secondary Air Status	string
13	O2_SENSORS	O2 Sensors Present	special
14	O2_B1S1	O2: Bank 1 - Sensor 1 Voltage	Unit.volt
15	O2_B1S2	O2: Bank 1 - Sensor 2 Voltage	Unit.volt

# Tools Overview

Methodology: **Waterfall** ★★★

Communication Line: **Slack** ★★

VCS Repository: **Github** ★★

Hardware: **Sparkfun OBD-II Board**  
★★★★★

Framework: **Node.js** ★★★★★

Database: **PostgreSQL** ★★★★★

Testing Tool: **Pytest, TravisCI**  
★★★★★

Deployment: **Ubuntu** ★★★



# Challenge 1: Parsing Through Log Values

- Different car brands support different OBD-II features
  - Dealing with the variety of returned commands, and the number of available commands in the client-side software was difficult

```
server | '02 Sensor 1 WR Lambda Current': '-0.00390625',
server | 'Bank 1 - Sensor 1': '281.5',
server | 'Supported PIDs [41-60]': '11111110110100000000010000000000',
server | 'Monitor status this drive cycle': '<obd.OBDResponse.Status object at',
server | 'Control module voltage': '14.112',
server | 'Absolute load value': '24.705882352941178',
server | 'Commanded equivalence ratio': '0.999424',
server | 'Relative throttle position': '5.490196078431373',
server | 'Ambient air temperature': '48',
server | 'Absolute throttle position B': '16.07843137254902',
server | 'Accelerator pedal position D': '14.509803921568627',
server | 'Accelerator pedal position E': '7.0588235294117645',
server | 'Commanded throttle actuator': '7.0588235294117645',
server | 'Long term secondary O2 trim - Bank 1': '0.0',
server | 'Supported MIDs [01-20]': '11000000000000000000000000000001',
server | '02 Sensor Monitor Bank 1 - Sensor 1': 'Unknown : 0.592432 count',
server | '02 Sensor Monitor Bank 1 - Sensor 2':
server | 'Rich to lean sensor threshold voltage : 743.59 millivolt [PASSED]\nLean to rich sensor threshold voltage : 743.59 millivolt [PASSED]\nRich to
lean sensor switch time : 20.0 millisecond [PASSED]\nMaximum sensor voltage for test cycle : 944.646 millivolt [PASSED]\nUnknown : 732.976 millivolt [PASSED]
Unknown : 752.496 millivolt [PASSED]\nUnknown : 850.0 millisecond',
server | 'Supported MIDs [21-40]': '1000000000000000000000000000000111001',
server | 'Catalyst Monitor Bank 1': 'Unknown : 4716.0 count',
server | 'EVAP Monitor (0.040)': 'Unknown : 3277.0 count',
server | 'EVAP Monitor (0.020)': 'Unknown : 3912.0 count',
server | 'Purge Flow Monitor': 'Unknown : 0.0 count [PASSED]\nUnknown : -0.051545 count',
server | 'Supported MIDs [41-60]': '1100000000000000000000000000000001',
server | '02 Sensor Heater Monitor Bank 1 - Sensor 1': 'Unknown : 779.9000000000001 degC',
server | '02 Sensor Heater Monitor Bank 1 - Sensor 2': 'Unknown : 450.0 ohm',
server | 'Supported MIDs [61-80]': '1000000000000000000000000000000001'
```

Unit.percent

Unit.celsius

Unit.percent

Unit.percent

Unit.percent

Unit.percent

Unit.kilopascal

Unit.kilopascal

Unit.rpm

Unit.kph

Unit.degree

Unit.celsius

Unit.grams\_per\_second

Unit.percent

string

special

Unit.volt

Unit.volt



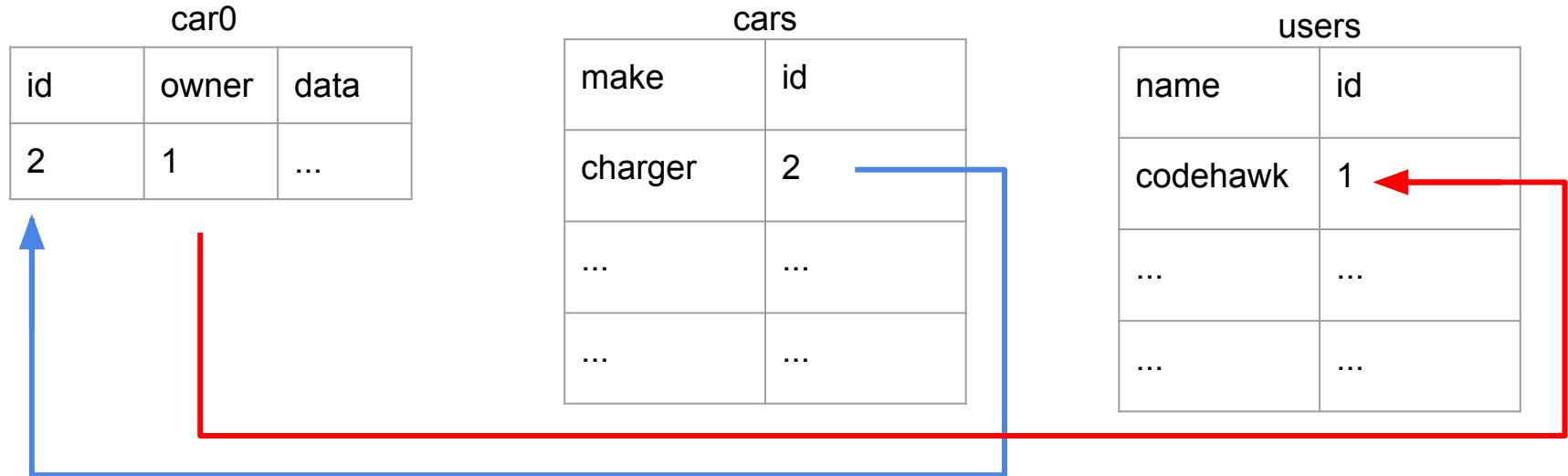
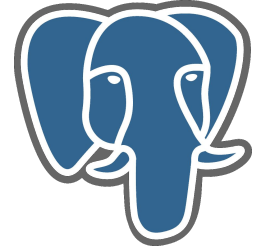
# Challenge 2: Async and Full Log

- Writing nodeJS middle-ware for full-log, live-data, and login was quite challenging.
- Had to connect user accounts with data read in dynamically by client program.
- Took more project time than expected



# Challenge 3: Database

- PostgreSQL
- Users Table - points to individual user tables
- Cars Table - points to individual car tables



# Challenge 4: Javascript Widgets

- Used to visualize some of car data on home page
- Hard to interpret raw car data
- Lots of casting and converting
- Caused less overall widgets than planned



# Final Product

<http://198.23.146.166:3000/home>

# Skype Live Experience

Sponsored by Arby's

