



Data science in the home with Home-assistant

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Some context

All kinds of connected devices
entering the home

A hub can centralise control of these
devices

Sadly, commercial hubs such as
Alexa aren't designed for data
scientists!



Learning thermostat



Home-assistant

- Open source, python 3, local, home automation hub
- Over 11,300 stars on [Github](#)
- pip3 install homeassistant

The screenshot shows the Home Assistant website at <https://home-assistant.io>. At the top, there's a browser header with a lock icon, the URL, and various icons. Below it, the main navigation bar includes links for Getting started, Components, Docs, Examples, Developers, Blog, and Need help? with a search icon.

The main content area features a large smartphone displaying the Home Assistant mobile application. The app's interface includes a top navigation bar with 'HOME' and 'OTHER' tabs, a microphone icon, and a menu icon. Below this, there are circular cards for weather and device status: Sun (Moon icon), Anne Therese (Profile pic), Paulus (Profile pic), Humidity (58.17%), Temperat. (20.95°C), UCSD Humidity (71%), and UCSD Temperat. (15.6°C). The bottom section shows a 'Living Room' section with two lightbulb icons labeled 'Bowl' and 'Ceiling' next to toggle switches.

On the right side of the website, a large white text area reads "Awaken your home". Below this, a descriptive paragraph states: "Home Assistant is an open-source home automation platform running on Python 3. Track and control all devices at home and automate control. Perfect to run on a Raspberry Pi." At the bottom, there are three calls-to-action: "GET STARTED", "VIEW DEMO", and "BROWSE CODE ON GITHUB".

Over 900 services can connect to Home-assistant

 Alexa / Amazon Echo voice	 Arduino diy	 Belkin WeMo hub	 Dark Sky weather
 ecobee hub	 Google Assistant voice	 Google Cast media-player	 IFTTT automation
 IKEA Trådfri (Tradfri) hub	 Kodi media-player	 MQTT hub	 MySensors hub
 Nest hub	 OwnTracks (via HTTP) presence-detection	 Philips Hue hub	 Philips Hue Light light
 Plex media-player	 Pushbullet notifications	 Sonos media-player	 Wink hub

Data science

- All state and event data in a single, time series database
- Use SQL queries, pandas
- Filter by day, time, entity, person (presence detection!)

DB Browser for SQLite - /Users/robincole/homeassistant/home-assistant_v2.db

New Database Open Database Write Changes Revert Changes

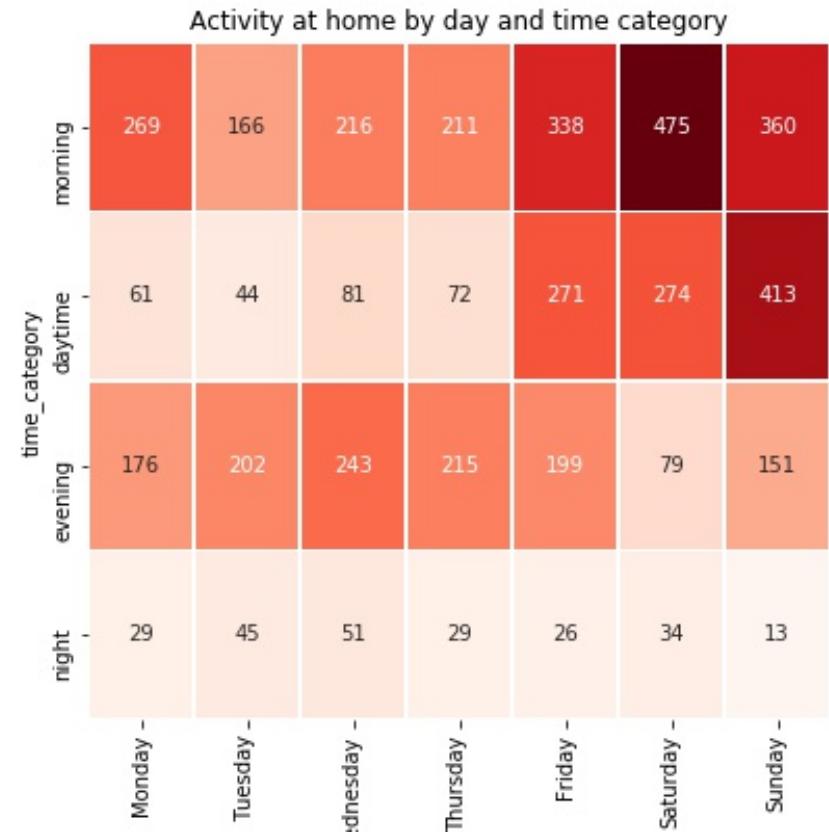
Database Structure Browse Data Edit Pragmas Execute SQL

Table: states New Record Delete Record

state_id	domain	entity_id	state	attributes	event_id	last_changed
1	20	sensor	sensor.robins_iphone	on	{"friendly_name": "NULL", "last_update": "2018-01-06 08:00:00", "light_level": 65, "name": "robins_iphone", "presence": true, "state": "on", "unit": "lux"}, {"friendly_name": "NULL", "last_update": "2018-01-06 08:00:00", "light_level": 65, "name": "robins_iphone", "presence": true, "state": "on", "unit": "lux"}]	2018-01-06 08:00:00
2	21	sensor	sensor.living_room_motion_sensor	on	{"friendly_name": "NULL", "last_update": "2018-01-06 08:00:00", "light_level": 65, "name": "living_room_motion_sensor", "presence": true, "state": "on", "unit": "lux"}, {"friendly_name": "NULL", "last_update": "2018-01-06 08:00:00", "light_level": 65, "name": "living_room_motion_sensor", "presence": true, "state": "on", "unit": "lux"}]	2018-01-06 08:00:00
3	22	sensor	sensor.hall_remote	1_hold	{"friendly_name": "NULL", "last_update": "2018-01-06 08:00:00", "light_level": 65, "name": "hall_remote", "presence": true, "state": "on", "unit": "lux"}, {"friendly_name": "NULL", "last_update": "2018-01-06 08:00:00", "light_level": 65, "name": "hall_remote", "presence": true, "state": "on", "unit": "lux"}]	2018-01-06 08:00:00
4	23	sensor	sensor.hall_motion_sensor	off	{"friendly_name": "NULL", "last_update": "2018-01-06 08:00:00", "light_level": 0, "name": "hall_motion_sensor", "presence": false, "state": "off", "unit": "lux"}, {"friendly_name": "NULL", "last_update": "2018-01-06 08:00:00", "light_level": 0, "name": "hall_motion_sensor", "presence": false, "state": "off", "unit": "lux"}]	2018-01-06 08:00:00
5	24	sensor	sensor.remote_bedroom	4_click	{"friendly_name": "NULL", "last_update": "2018-01-06 08:00:00", "light_level": 65, "name": "remote_bedroom", "presence": true, "state": "on", "unit": "lux"}, {"friendly_name": "NULL", "last_update": "2018-01-06 08:00:00", "light_level": 65, "name": "remote_bedroom", "presence": true, "state": "on", "unit": "lux"}]	2018-01-06 08:00:00
6	25	sensor	sensor.bedroom_motion_sensor	off	{"friendly_name": "NULL", "last_update": "2018-01-06 08:00:00", "light_level": 0, "name": "bedroom_motion_sensor", "presence": false, "state": "off", "unit": "lux"}, {"friendly_name": "NULL", "last_update": "2018-01-06 08:00:00", "light_level": 0, "name": "bedroom_motion_sensor", "presence": false, "state": "off", "unit": "lux"}]	2018-01-06 08:00:00
7	26	sensor	sensor.hue_tap	1_click	{"friendly_name": "NULL", "last_update": "2018-01-06 08:00:00", "light_level": 65, "name": "hue_tap", "presence": true, "state": "on", "unit": "lux"}, {"friendly_name": "NULL", "last_update": "2018-01-06 08:00:00", "light_level": 65, "name": "hue_tap", "presence": true, "state": "on", "unit": "lux"}]	2018-01-06 08:00:00
8	27	sensor	sensor.living_room_remote	N_hold	{"friendly_name": "NULL", "last_update": "2018-01-06 08:00:00", "light_level": 65, "name": "living_room_remote", "presence": true, "state": "on", "unit": "lux"}, {"friendly_name": "NULL", "last_update": "2018-01-06 08:00:00", "light_level": 65, "name": "living_room_remote", "presence": true, "state": "on", "unit": "lux"}]	2018-01-06 08:00:00
9	28	sensor	sensor.living_room_motion_sensor	off	{"friendly_name": "NULL", "last_update": "2018-01-06 08:00:00", "light_level": 65, "name": "living_room_motion_sensor", "presence": true, "state": "on", "unit": "lux"}, {"friendly_name": "NULL", "last_update": "2018-01-06 08:00:00", "light_level": 65, "name": "living_room_motion_sensor", "presence": true, "state": "on", "unit": "lux"}]	2018-01-06 08:00:00

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Making Home-assistant smart with data science?

- *Automations to save time/energy/money*
- *Non invasive monitoring*
- *A home that knows how you like your toast*
- *Your ideas here..!*



Thanks for listening, and checkout <https://home-assistant.io/>