Get started and dive into your data

Me

Cláudio Gamboa

18 years software development

Mostly Frontend (no CSS), Backend, devOps, DB architect at Bright Pixel

@suskind

Data Visualisation

Data visualisation is viewed by many disciplines as a modern equivalent of visual communication. It involves the creation and study of the **visual** representation of **data.**

–From Wikipedia, so it's true :)

but why?

Data and numbers are always in our lives

- Work hours
- Sleep time
- Weight
- Wearables
- Calories
- … and so on…

USD to EUR exchange rate (by day) 2007 - 2018

0.7537, 0.7537, 0.7559, 0.7631, 0.7644, 0.769, 0.7683, 0.77, 0.7703, 0.7757, 0.7728, 0.7721, 0.7748,
0.774, 0.7718, 0.7731, 0.767, 0.769, 0.7706, 0.7752, 0.774, 0.771, 0.7721, 0.7681, 0.7681, 0.7738, 0.772,
0.7701, 0.7699, 0.7689, 0.7719, 0.768, 0.7645, 0.7613, 0.7624, 0.7616, 0.7608, 0.7608, 0.7631, 0.7615,
0.76, 0.756, 0.757, 0.7562, 0.7598, 0.7645, 0.7635, 0.7614, 0.7604, 0.7603, 0.7602, 0.7566, 0.7587,
0.7562, 0.7506, 0.7518, 0.7522, 0.7524, 0.7491, 0.7505, 0.754, 0.7493, 0.7493, 0.7491, 0.751, 0.7483,
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0.7351, 0.7377, 0.7364, 0.7328, 0.7356, 0.7331, 0.7351, 0.7351, 0.736, 0.7347, 0.7375, 0.7346, 0.7377,
0.7389, 0.7394, 0.7416, 0.7382, 0.7388, 0.7368, 0.74, 0.7421, 0.7439, 0.7434, 0.7414, 0.7437, 0.7441,
0.7434, 0.7403, 0.7453, 0.7434, 0.7444, 0.7418, 0.7391, 0.7401, 0.7425, 0.7492, 0.7489, 0.7494, 0.7527,
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0.7323, 0.732, 0.7337, 0.7349, 0.7298, 0.7337, 0.7365, 0.736, 0.7317, 0.7302, 0.725, 0.7235, 0.7203,
0.7197, 0.7216, 0.7207, 0.7212, 0.7157, 0.7129, 0.7119, 0.7087, 0.709, 0.708, 0.7053, 0.7054, 0.7027,
0.7061, 0.7046, 0.7089, 0.7075, 0.7099, 0.7125, 0.707, 0.7044, 0.7057, 0.703, 0.7068, 0.7043, 0.6994,
0.7, 0.706, 0.7017, 0.7028, 0.699, 0.6953, 0.695, 0.6942, 0.6923, 0.6934, 0.6908, 0.6903, 0.6875, 0.6794,
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0.6517, 0.647, 0.6482, 0.6464, 0.6478, 0.6463, 0.6453, 0.6421, 0.6395, 0.6349, 0.6348, 0.6353, 0.6346,
0.6346, 0.6388, 0.6431, 0.6449, 0.6444, 0.6414, 0.6467, 0.6494, 0.6412, 0.6337, 0.6442, 0.6446, 0.6487,
0.6522, 0.647, 0.6462, 0.6456, 0.6461, 0.6407, 0.6444, 0.6424, 0.6412, 0.6358, 0.6351, 0.6345, 0.634,
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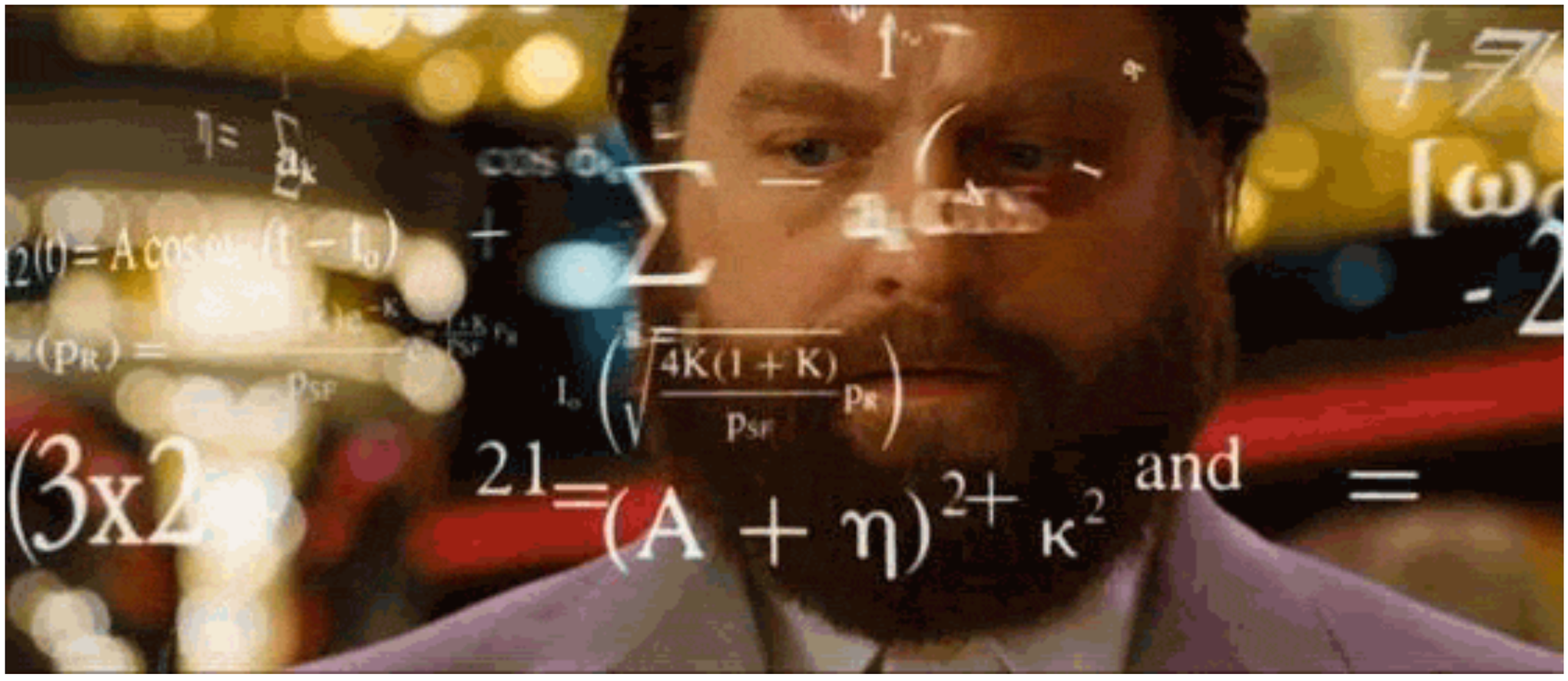

(3x2
21=(A + η)²+ κ²
and
=


USD to EUR exchange rate (2007 - 2018)
Exchange rate
1
0.9
0.8
0.7
0.6
2008
2010
2012
2014
2016
2018
Highcharts.com

Published on TradingView.com, April 14, 2019 00:57:50 UTC
Bitfinex:BTC/USD, 1W O:5238.9 **H:**5488.0 **L:**4934.7 **C:**5114.4

Created with TradingView

Top 15 Best Global Brands Ranking

Brand Value $m

20000 40000 60000 80000

Coca-Cola 72537
Microsoft 70196
IBM 53183
Intel 39048
Nokia 38528
GE 38127
Ford 36368
Disney 33553
McDonald's 27859
AT&T 25548
Marlboro 22110
Mercedes-Benz 21104
HP 20572
Cisco 20067
Toyota 18823

TOP GROWING

Coca-Cola

2000

Social Media Followers

26,472 Likes

13,911 Subscribers

6,524 Followers

5,093 Circled By

45,322 Followers

1,765 Followers

Wistia Video Stats

Metrics Driven Change Management

563 Play Count

75% Engagement

49% Play Rate

CallRail Today's Average Call Duration

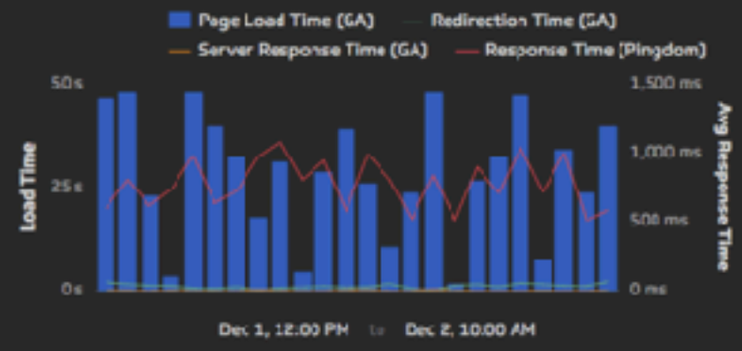
Company: The Kip Factory

10m:8s

Based on 19 calls

Pingdom & Google Analytics: Load Time vs Response Time

Web Site



Salesforce Accounts by Country

Invalid state information provided for 646 of 13124 accounts.

QuickBooks & Google Analytics: Marketing Expenses/Traffic

Advertising & Promotion

$16,839

11.75% ▲ vs $15,069 (prev.)

Session Traffic

280,430

23.44% ▲ vs 216,646 (prev.)

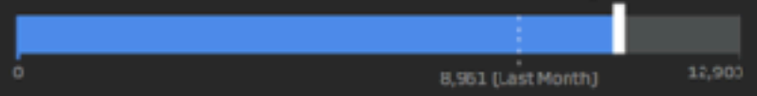
Quickbooks & Salesforce: CAC (Last 30 Days)

$15,085 CAC Value

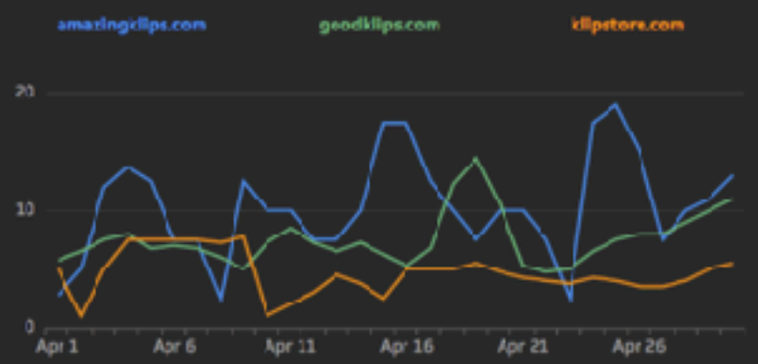
▼ -29.99% vs $21,540 prev. 30 days

Leads (This Month)

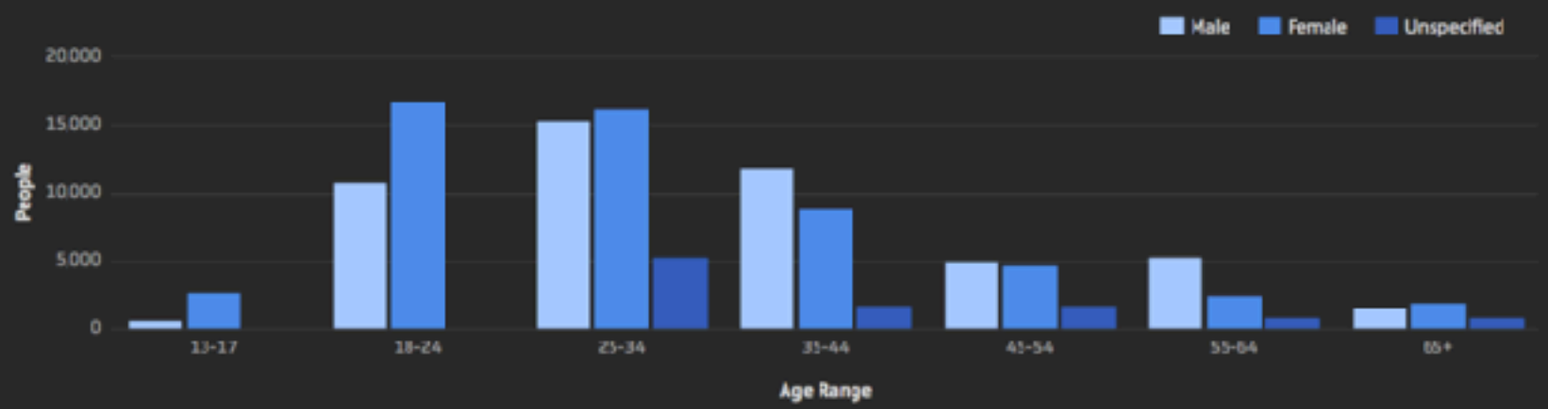
10,753



Alexa Page Views per User (Last 30 days)



Facebook Demographics

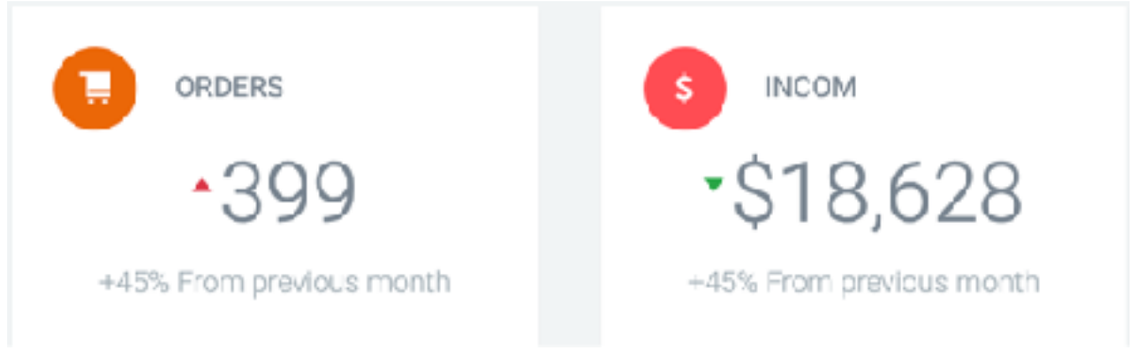


How to make beautiful data?

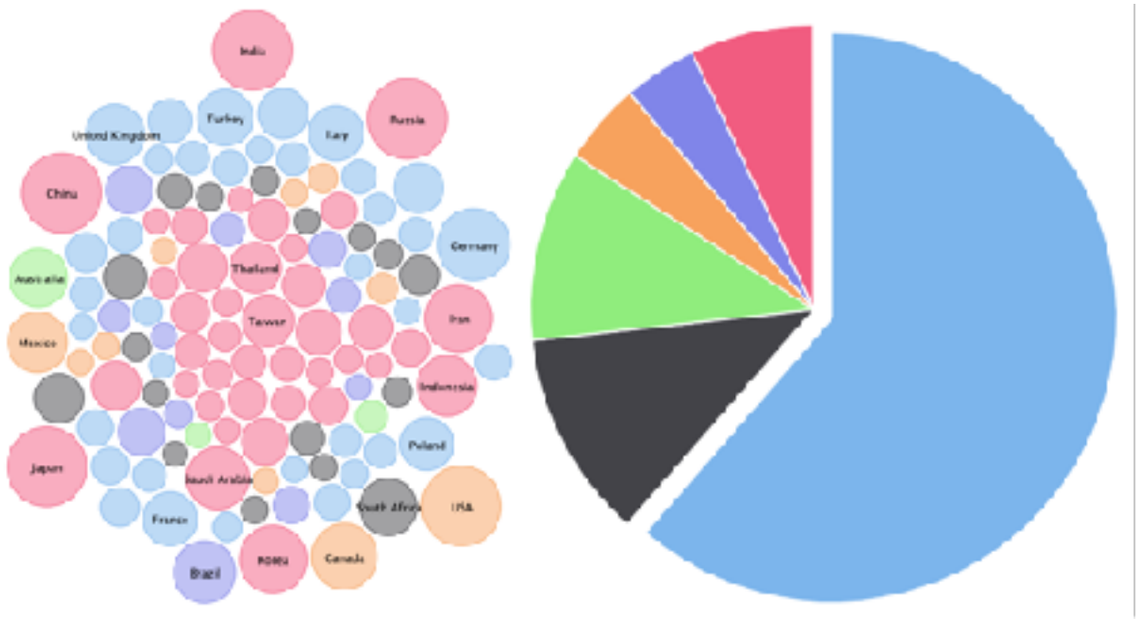
Output

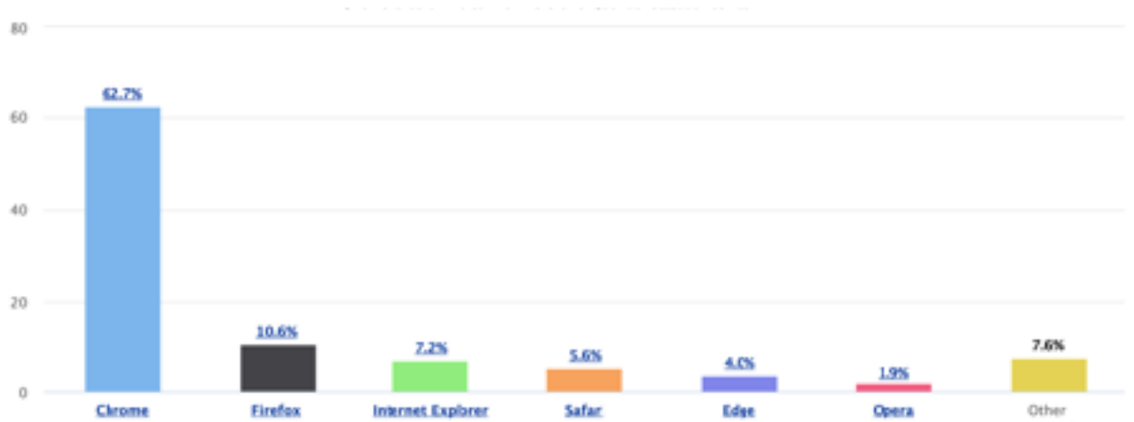
- How much/many
  What percent
- Trending
- Correlation
- Geographic

Output



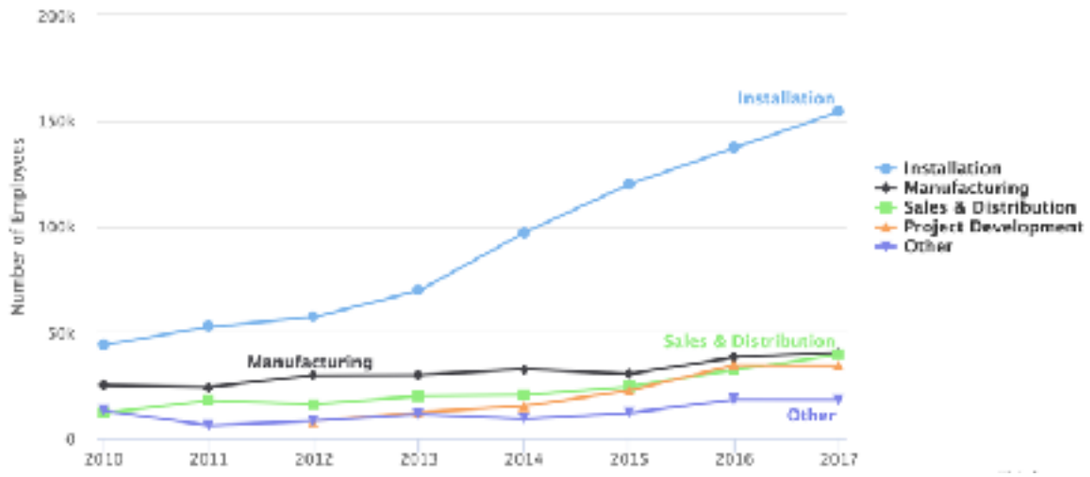
- **How much/many**
  What percent
- Trending
- Correlation
- Geographic

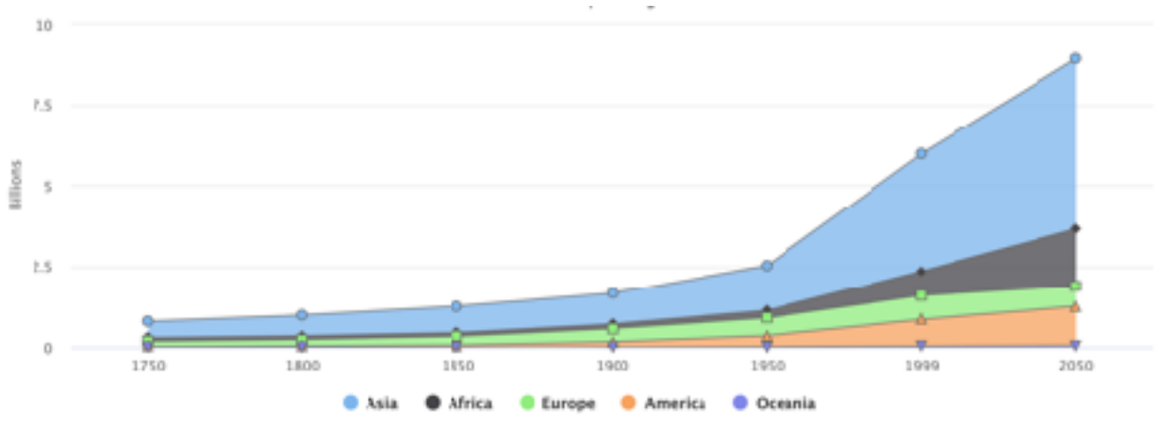




Output

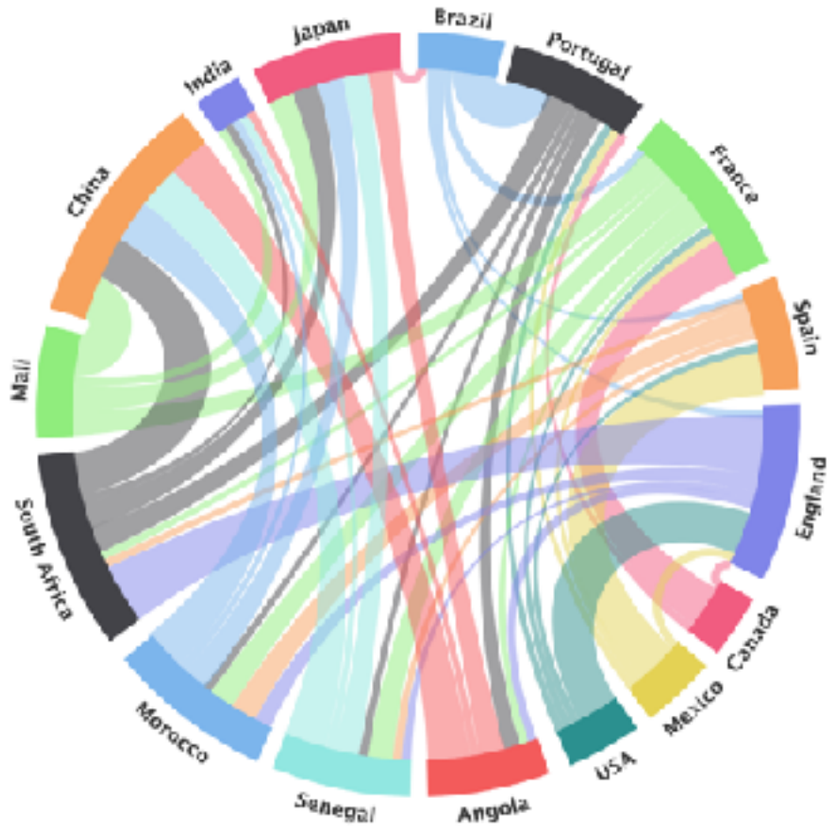
- How much/many
  What percent
- **Trending**
- Correlation
- Geographic

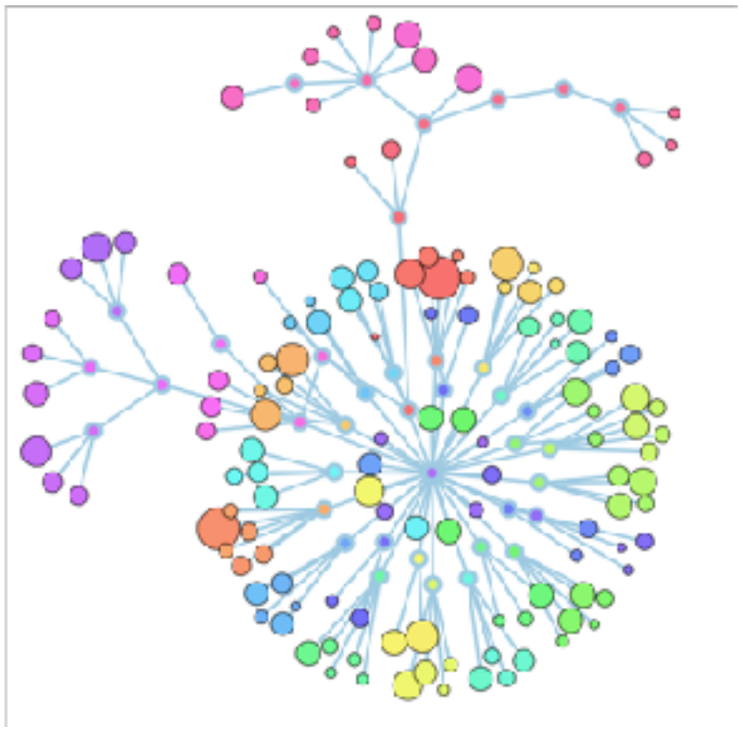




Output

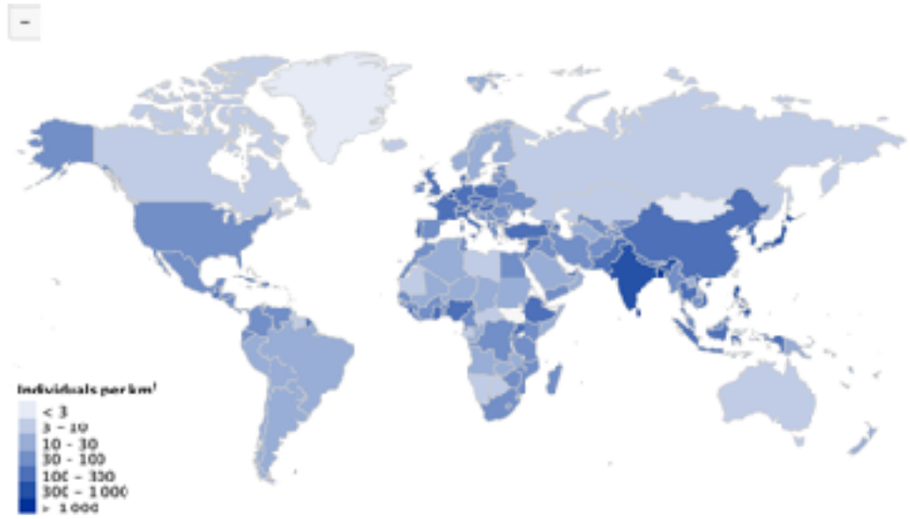
- How much/many
  What percent
- Trending
- **Correlation**
- Geographic

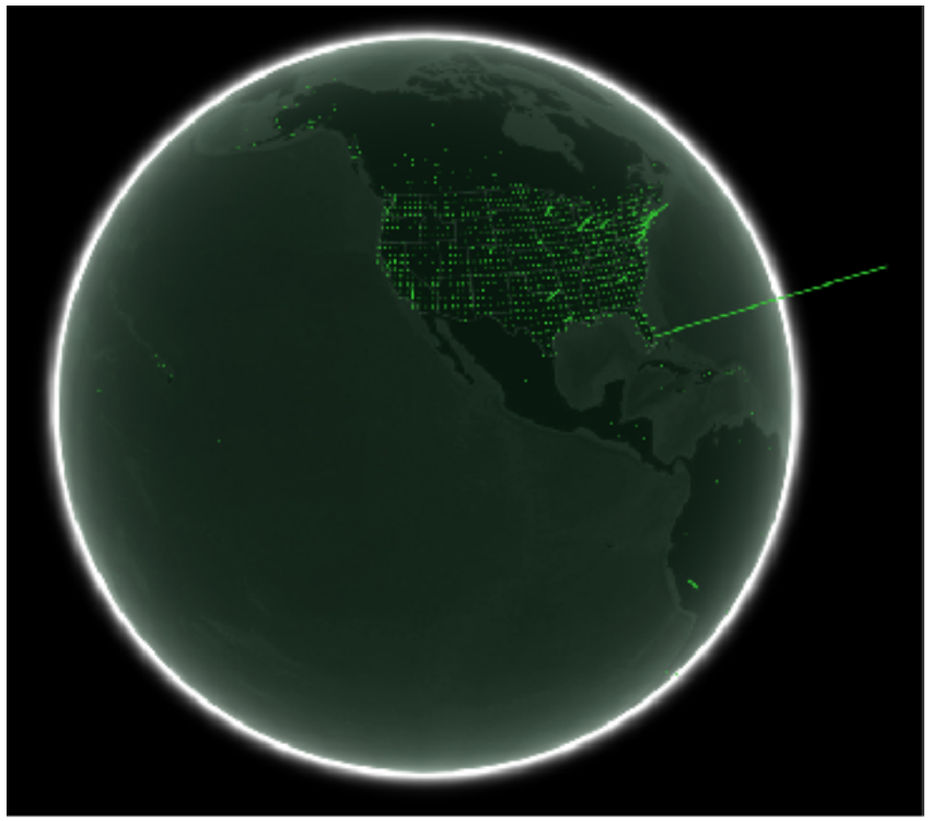




Output

- How much/many
  What percent
- Trending
- Correlation
- **Geographic**





Tools

Services

- **Infogram** - infogram.com
- **Piktochart** - piktochart.com
- **emaze** - emaze.com

Software

- Apache Superset
- Metabase
- Pivot *
- Tableau *

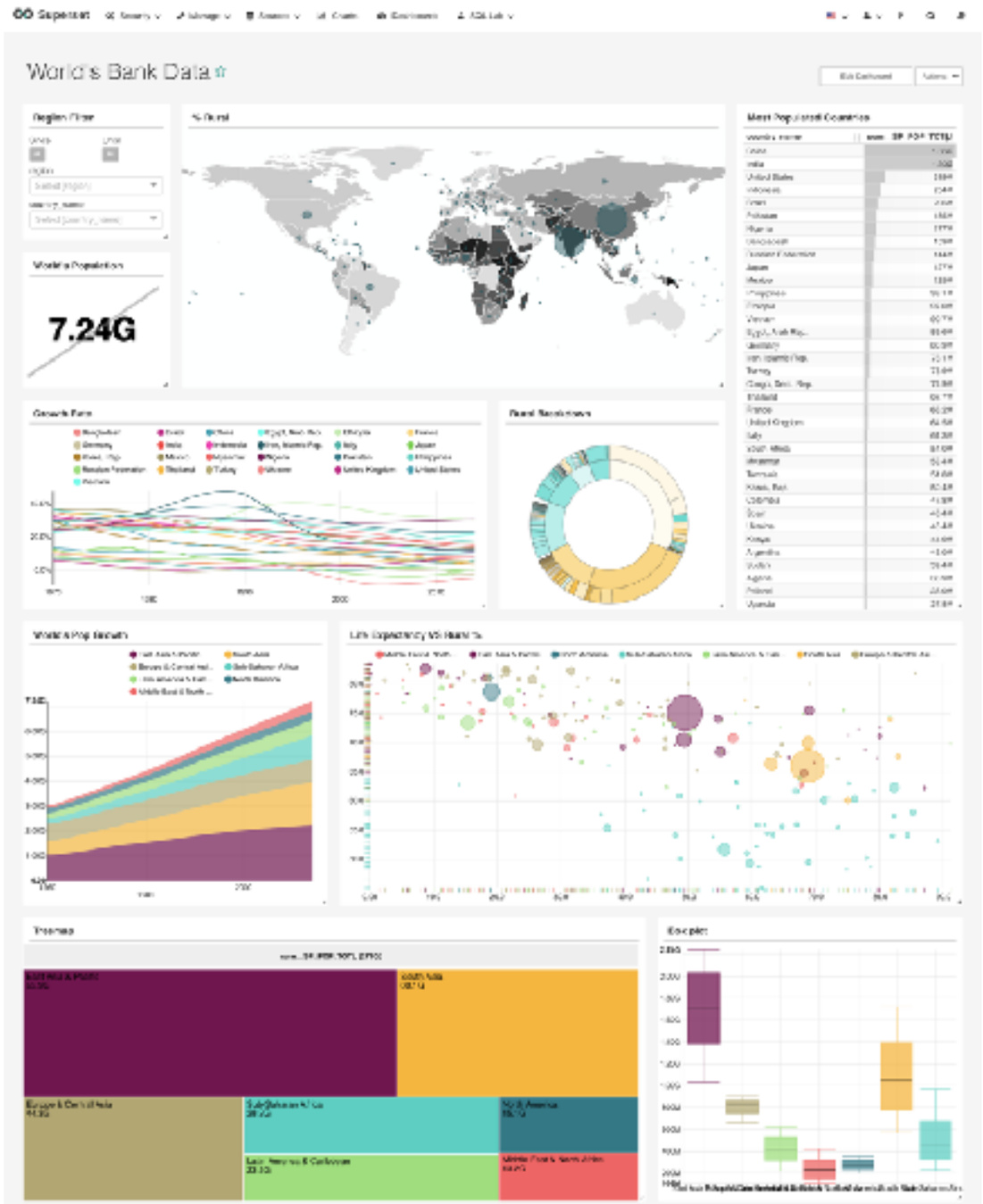
Software

Apache Superset

- https://superset.incubator.apache.org
- Deep integration with Druid
- Python 3
- Integration with most common databases
- Runs on containers

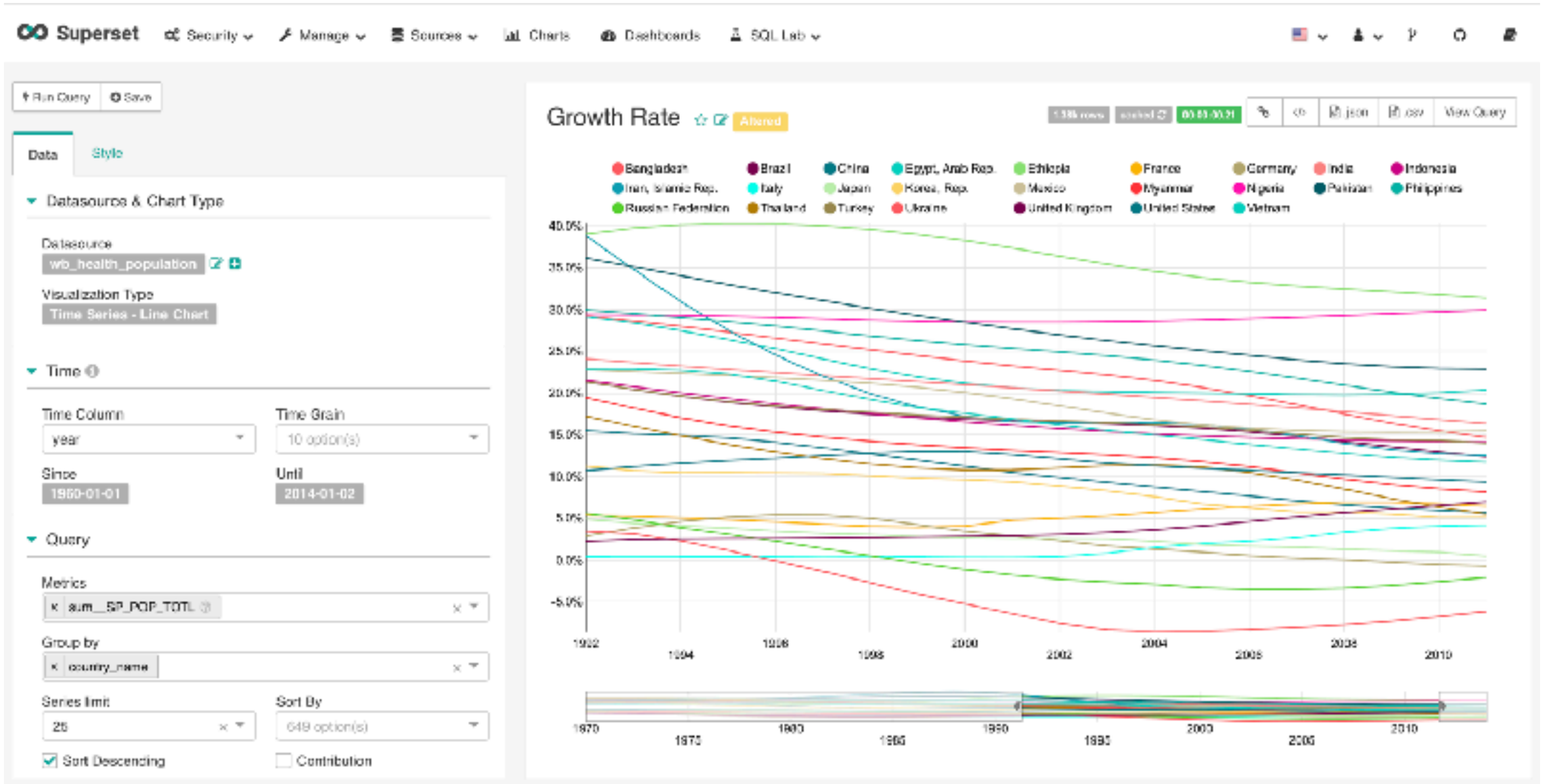
Software

Apache Superset



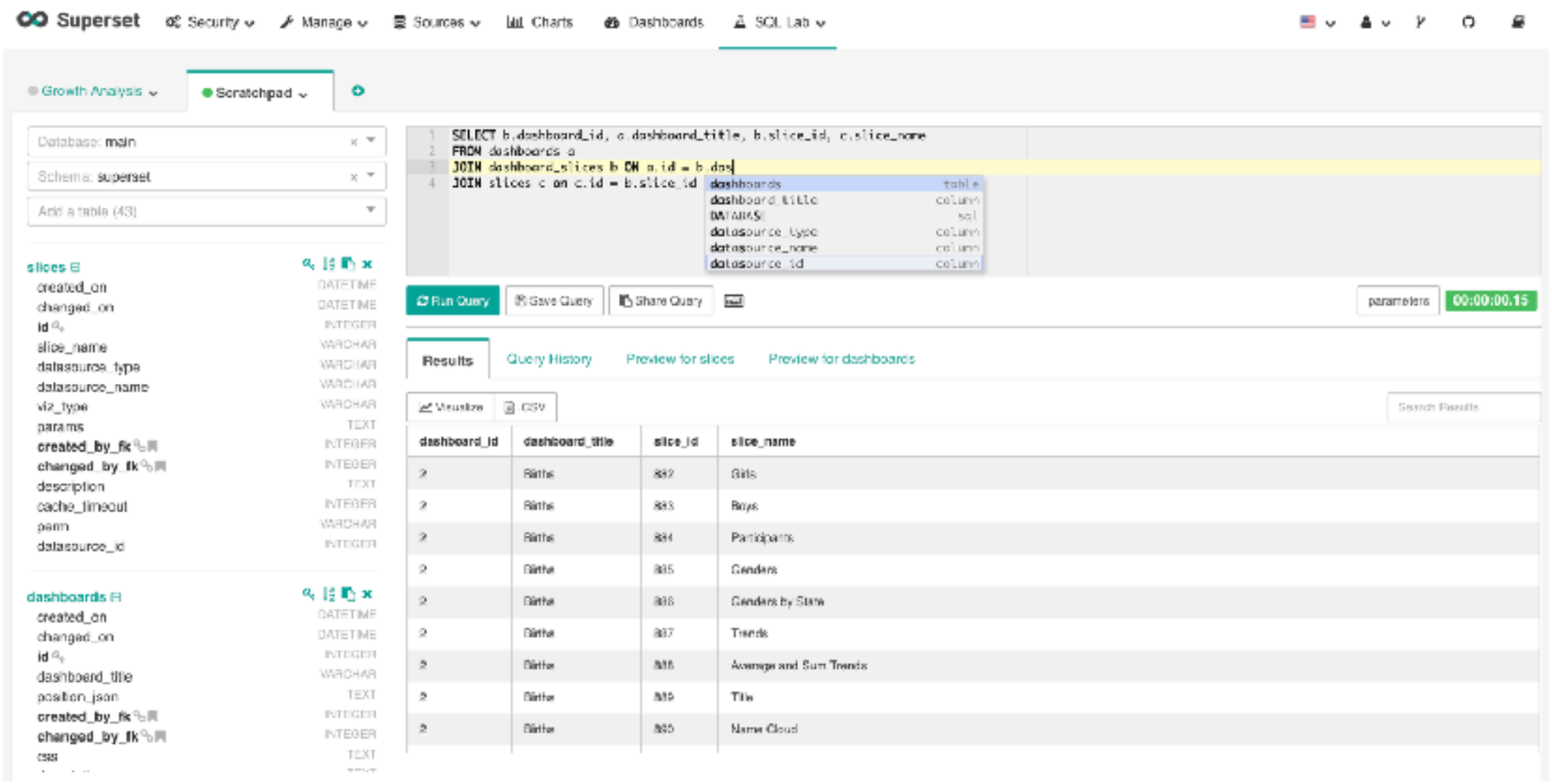
Software

Apache Superset



Software

Apache Superset



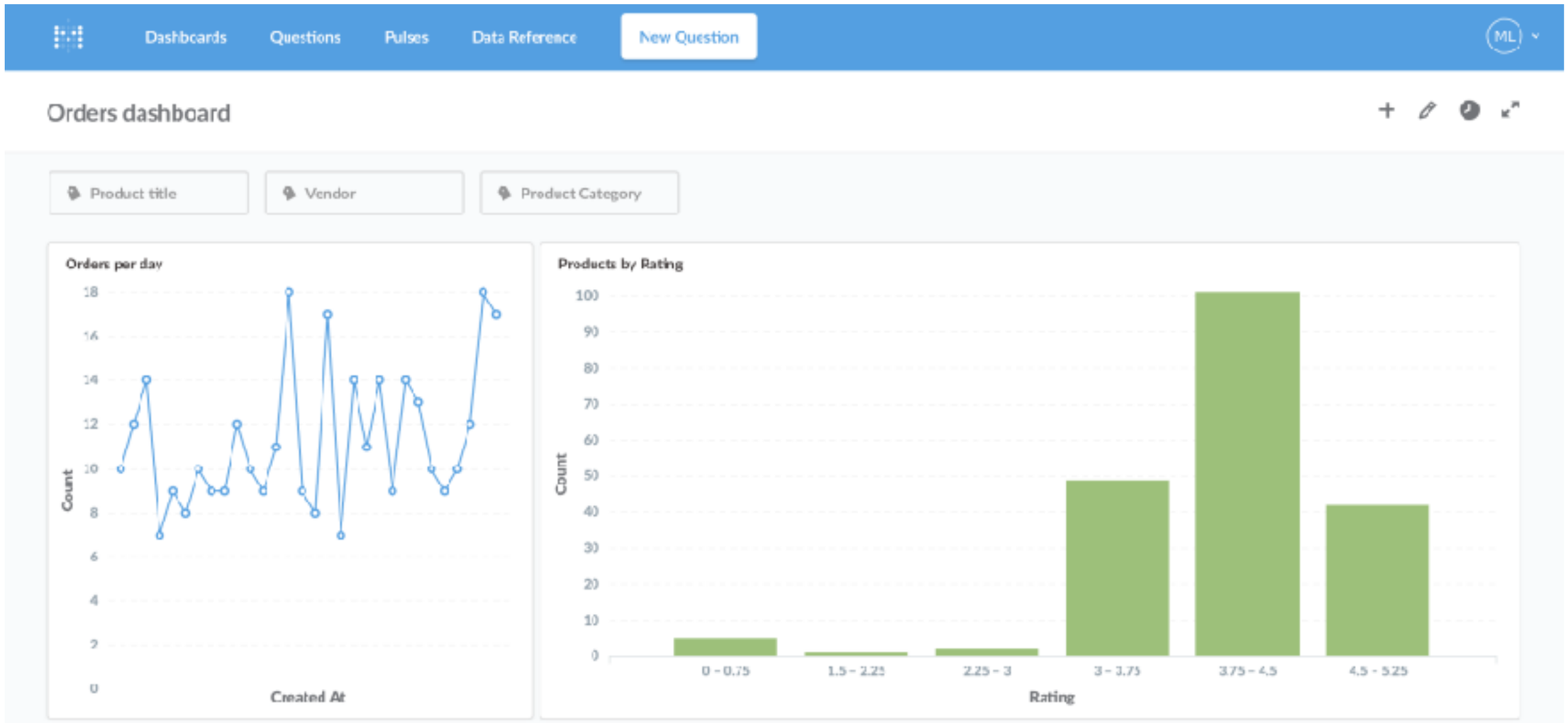
Software

Metabase

- https://metabase.com
- Integration with most common databases
- Run on containers (cloud option)

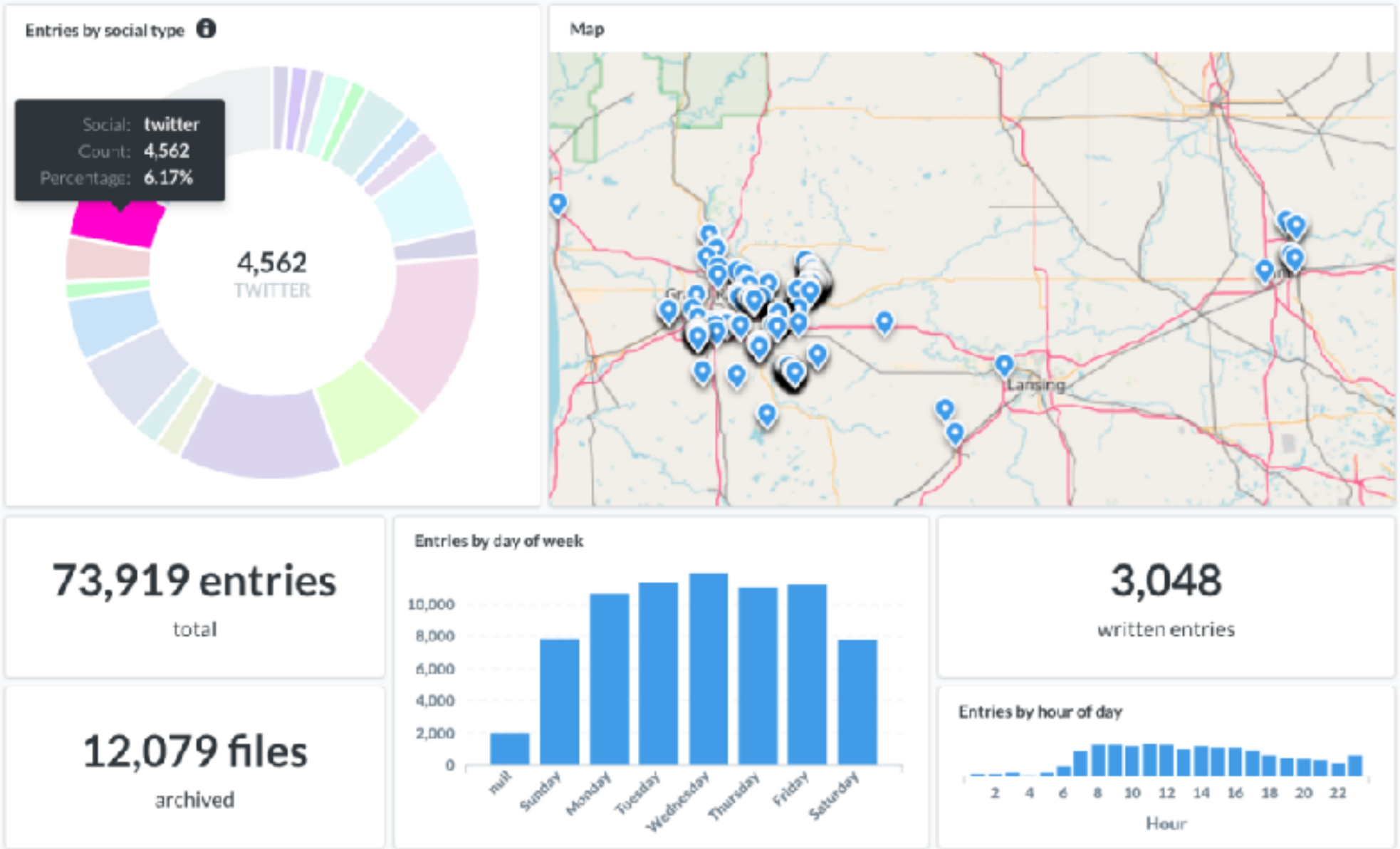
Software

Metabase



Software

Metabase



Building from scratch

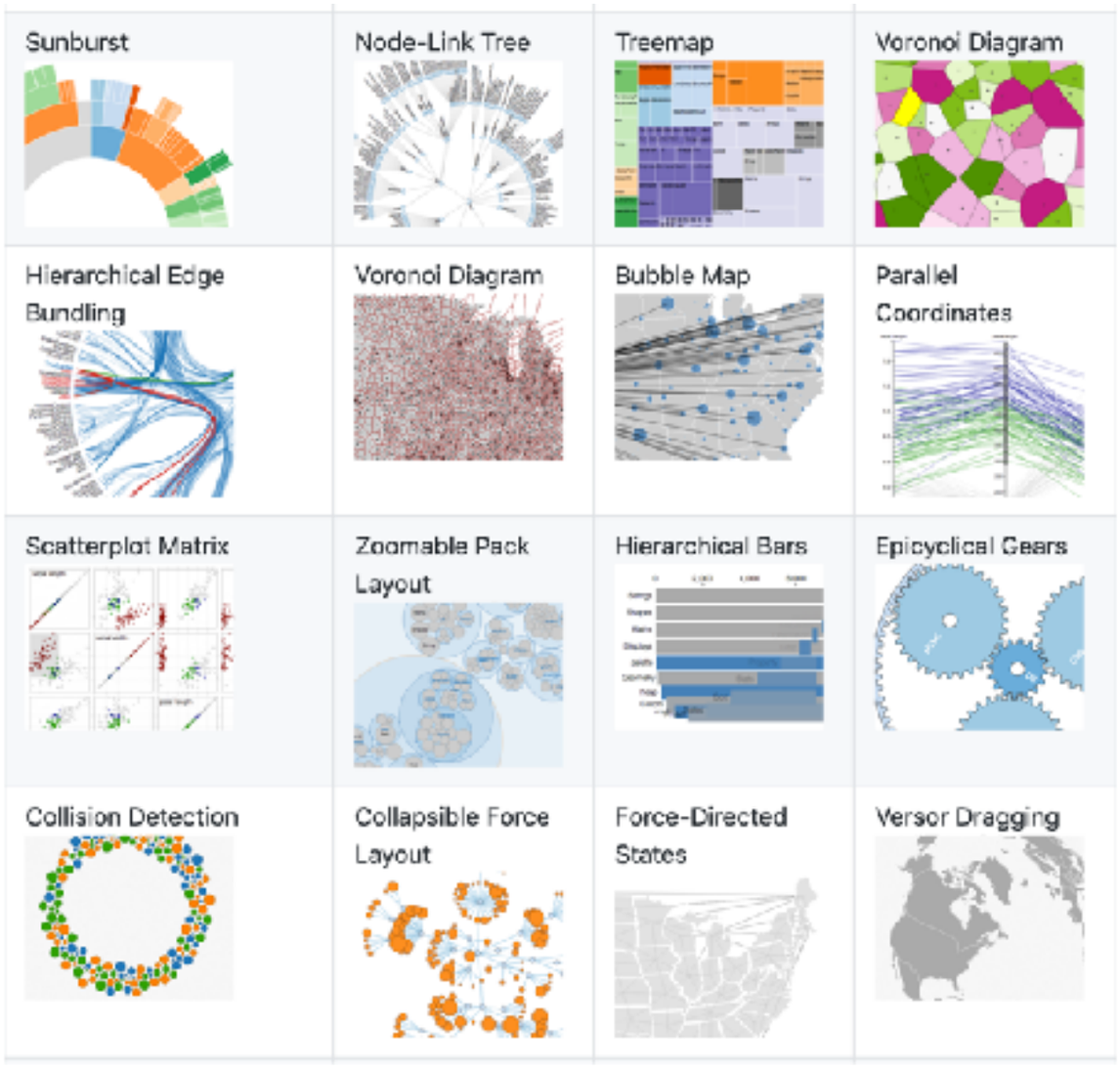
D3

https://d3js.org

- Most powerful solution
- Open source
- Good documentation
- Not easy for simple visualisations 👎

D3

https://d3js.org



https://github.com/d3/d3/wiki/Gallery

HighCharts

https://highcharts.com

- Free for non-commercial
- Paid licence with premium support
- Good documentation
- Mobile friendly
- Products Highcharts, Highstock, Highmaps
- iOS and Android wrappers
- React, Angular, Vue wrappers

HighCharts

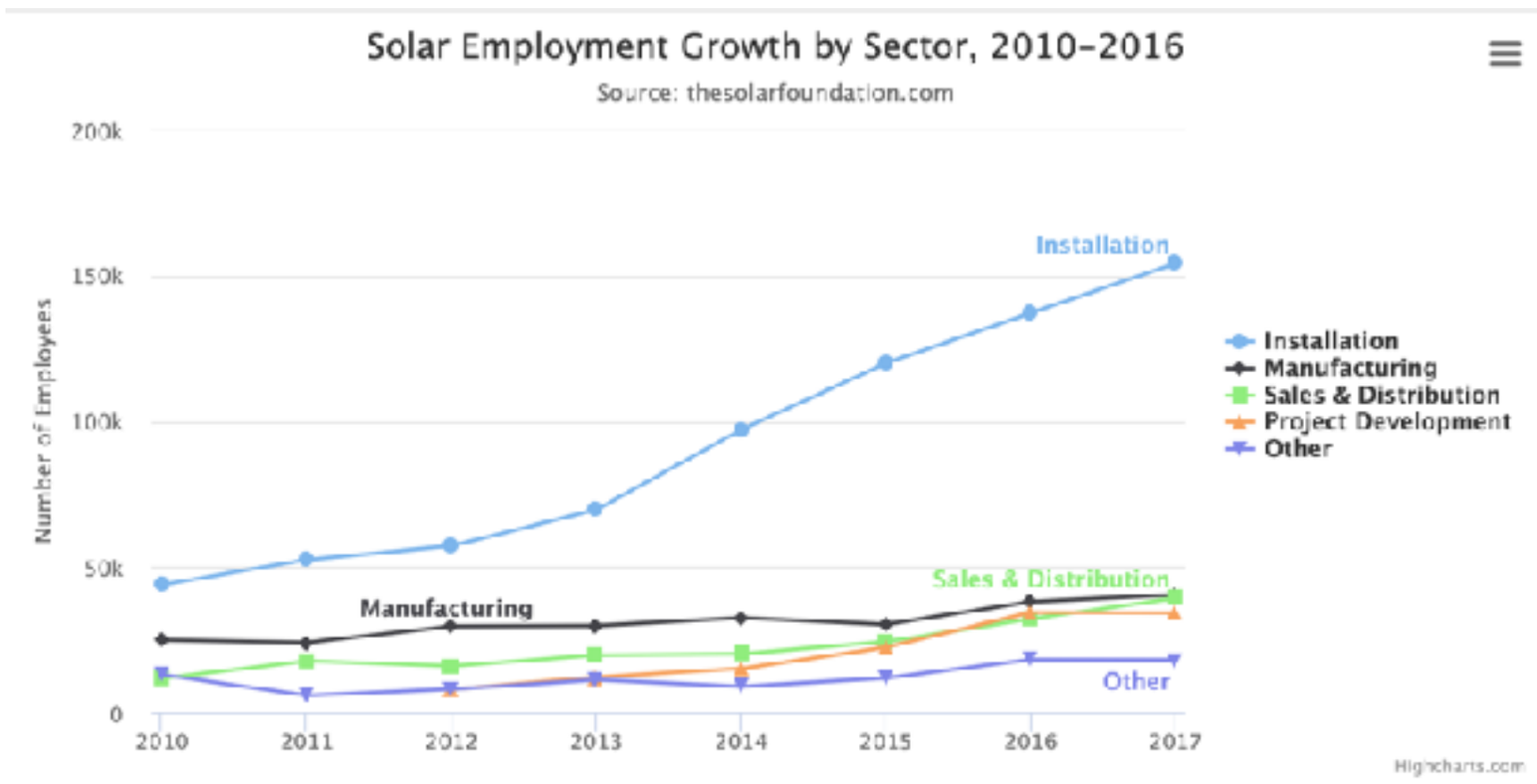
https://highcharts.com

```
Highcharts.chart("container", {
  title: {text: "Solar Employment Growth by Sector, 2010-2016"},
  subtitle: {text: "Source: thesolarfoundation.com"},
  yAxis: {title: {text: "Number of Employees"}},
  legend: {
    layout: "vertical",
    align: "right",
    verticalAlign: "middle"
  },
  plotOptions: {
    series: {
      label: {
        connectorAllowed: false
      },
      pointStart: 2010
    }
  },
  series: [
    {name: "Installation", data: [43934, 52503, 57177, 69658, 97031, 119931, 137133, 154175]},
    {name: "Manufacturing", data: [24916, 24064, 29742, 29851, 32490, 30282, 38121, 40434]},
    {name: "Sales & Distribution", data: [11744, 17722, 16005, 19771, 20185, 24377, 32147, 39387]},
    {name: "Project Development", data: [null, null, 7988, 12169, 15112, 22452, 34400, 34227]},
    {name: "Other", data: [12908, 5948, 8105, 11248, 8989, 11816, 18274, 18111]}
  ],
  responsive: {
    rules: [{
        condition: {
          maxWidth: 500
        },
        chartOptions: {
          legend: {
            layout: "horizontal",
            align: "center",
            verticalAlign: "bottom"
          }
        }
      }
    ]
  }
});

```

HighCharts

https://highcharts.com



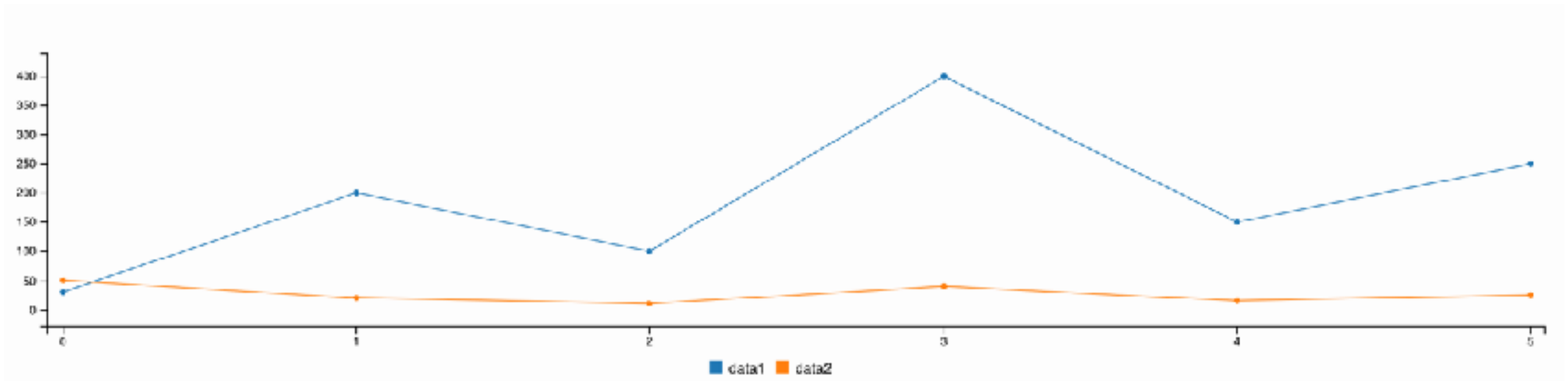
C3

https://c3js.org

- D3 based
- Only for graphics
- Easy to use

C3

https://c3js.org



C3

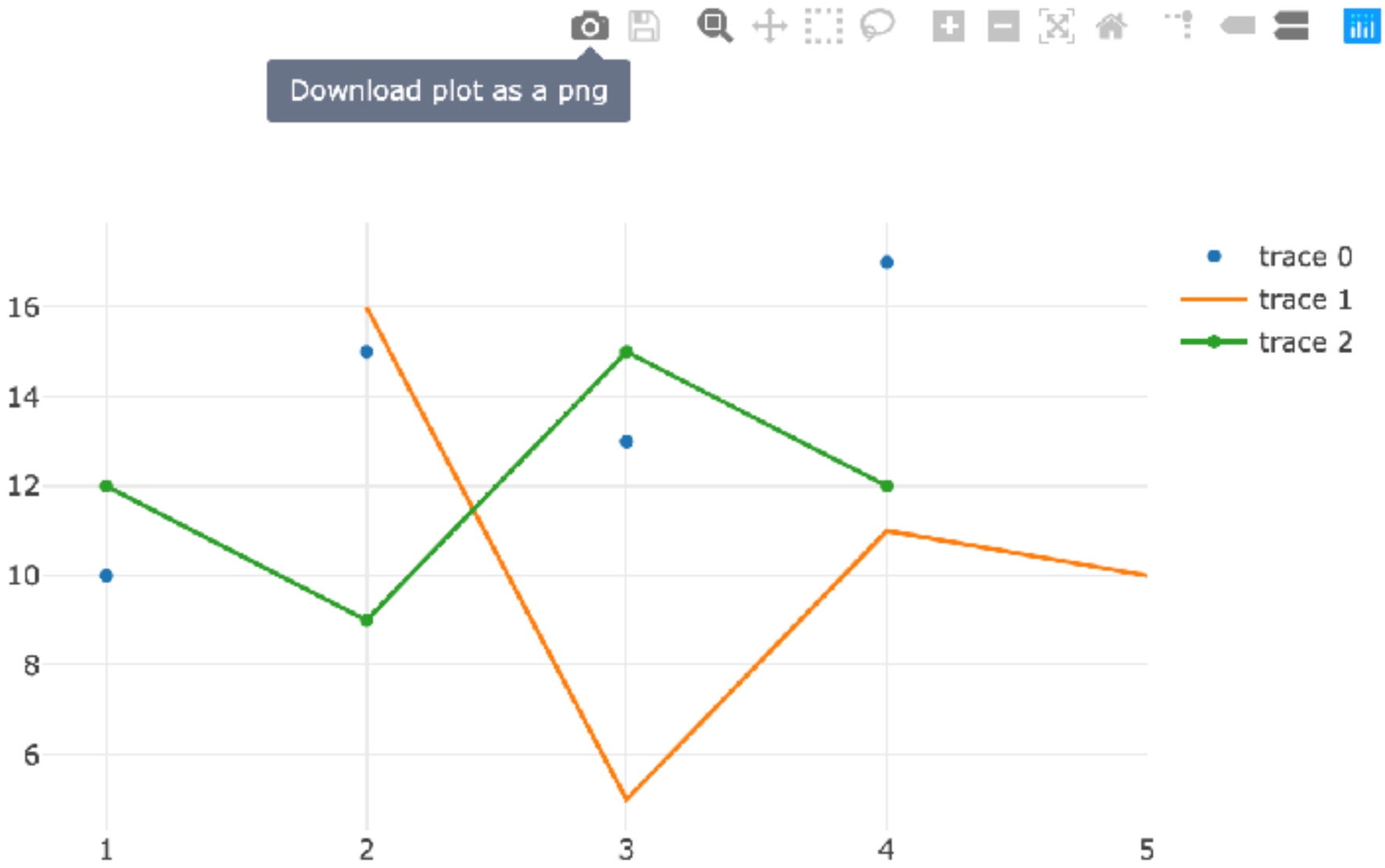
https://c3js.org

```
1
2   var chart = c3.generate({
3     bindto: document.getElementById('container'),
4     data: {
5       type: 'line',
6       columns: [
7         ["data1", 30, 200, 100, 400, 150, 250],
8         ["data2", 50, 20, 10, 40, 15, 25]
9       ]
10    }
11  });
12
13
```

Plotly.js

- D3 based
- 20 chart types
- 3D charts
- Supports maps
- Open source
- Python, R, Matlab, Node.js

Plotly.js


Download plot as a png
trace 0
trace 1
trace 2
16
14
12
10
8
6
1
2
3
4
5

Plotly.js

```
1
2   var trace1 = {
3     x: [1, 2, 3, 4],
4     y: [10, 15, 13, 17],
5     mode: "markers",
6     type: "scatter"
7   };
8
9   var trace2 = {
10    x: [2, 3, 4, 5],
11    y: [16, 5, 11, 9],
12    mode: "lines",
13    type: "scatter"
14  };
15
16  var trace3 = {
17    x: [1, 2, 3, 4],
18    y: [12, 9, 15, 12],
19    mode: "lines+markers",
20    type: "scatter"
21  };
22
23  var data = [trace1, trace2, trace3];
24
25  Plotly.newPlot("myDiv", data);
26
```

Plotly.js

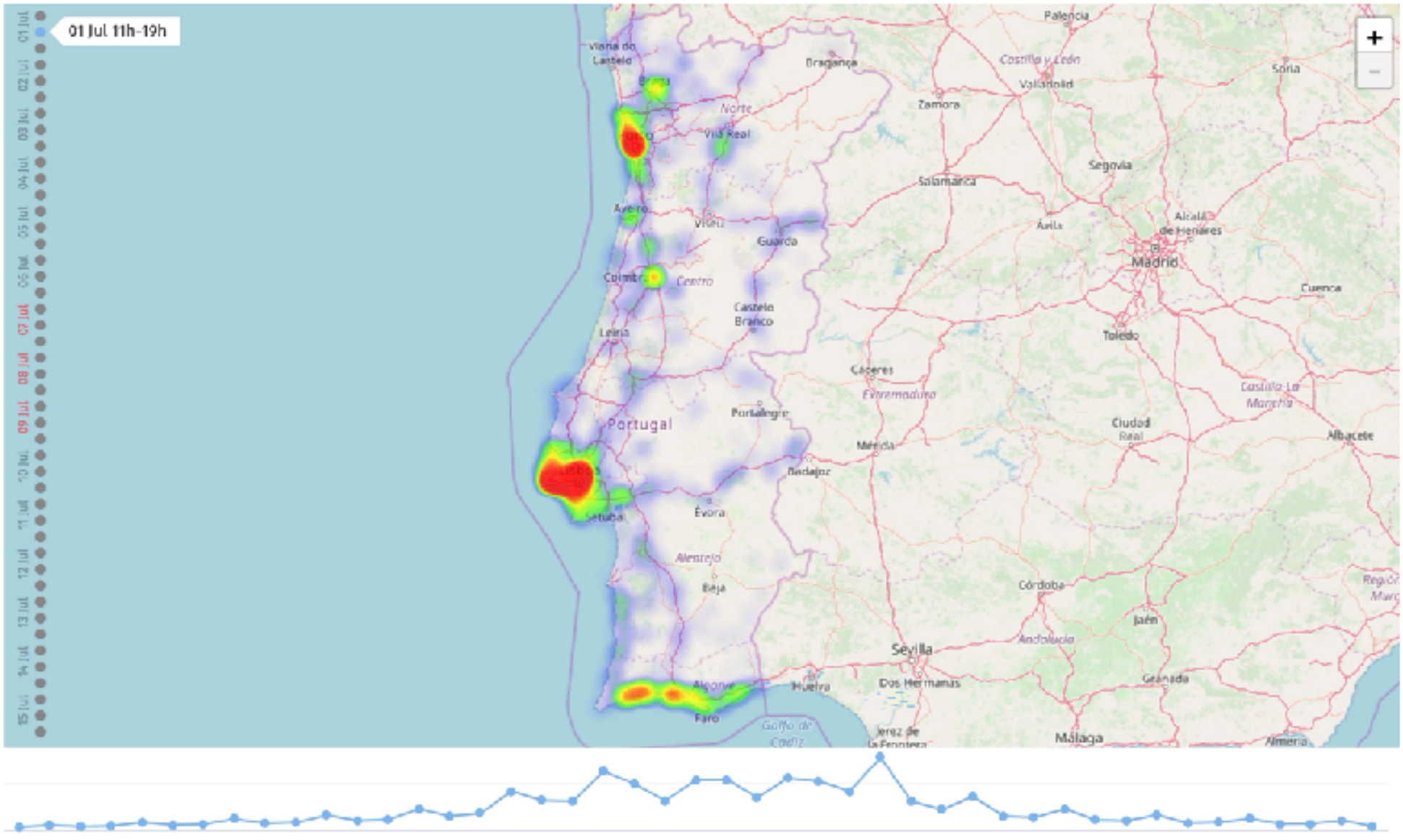
Leaflet

https://leafletjs.com

- Open source
- Plugins
    - Heatmap
    - Data Visualisation
- Good documentation
- OpenStreetMaps
- Mobile friendly

Leaflet

https://leafletjs.com



OpenLayers

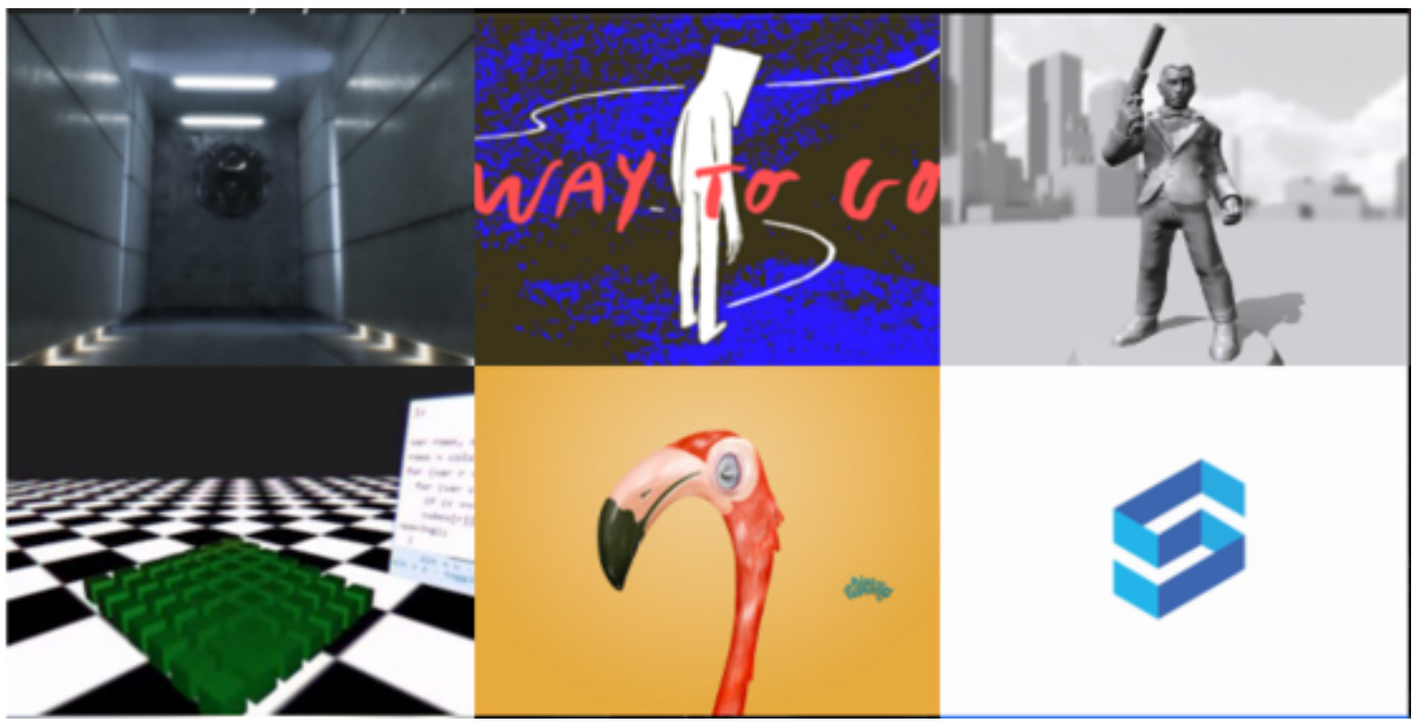
https://openlayers.org

- Open Source
- Heatmap support
- D3 Integration
- OpenStreetMaps
- Big documentation… But confused

ThreeJS

https://threejs.org

- Open Source
- WebGL
- Easy to use (for people who don’t know 3D)



ThreeJS

https://threejs.org

QA

Thank you