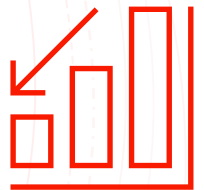


Crafting Web ▼ Visuals: Interactive Graphs & Charts

Courtney Yatteau | Beer City Code 2025

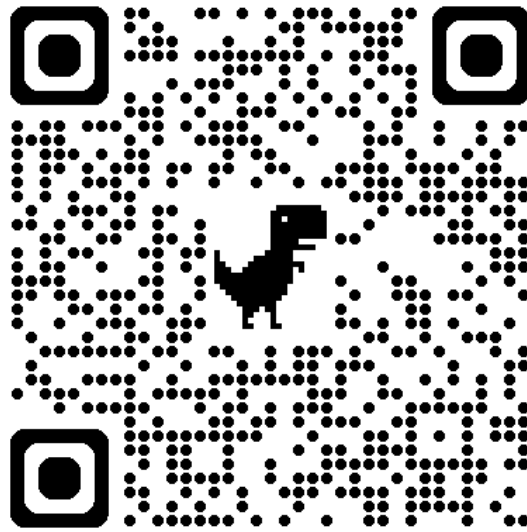


Courtney Yatteau

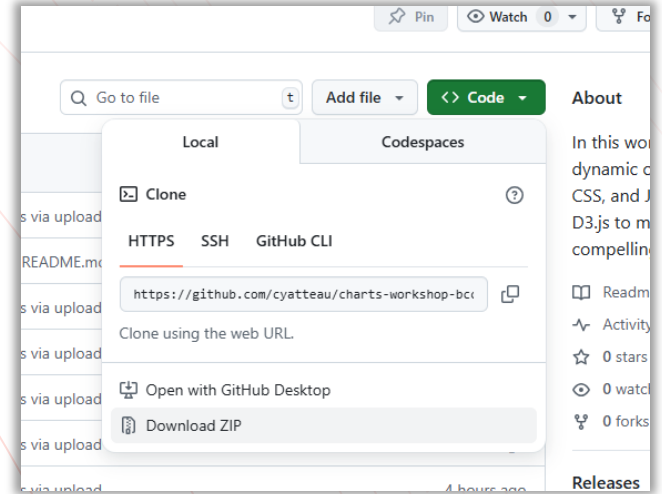
Developer Advocate, Esri



Modules and Slides



[github.com/cyatteau/
charts-workshop-bcc2025](https://github.com/cyatteau/charts-workshop-bcc2025)



Download the zip folder

Agenda



Setup & Data Viz Overview



Modules – Chart.js, D3.js, ArcGIS Charts



Games & Breaks



Team Projects



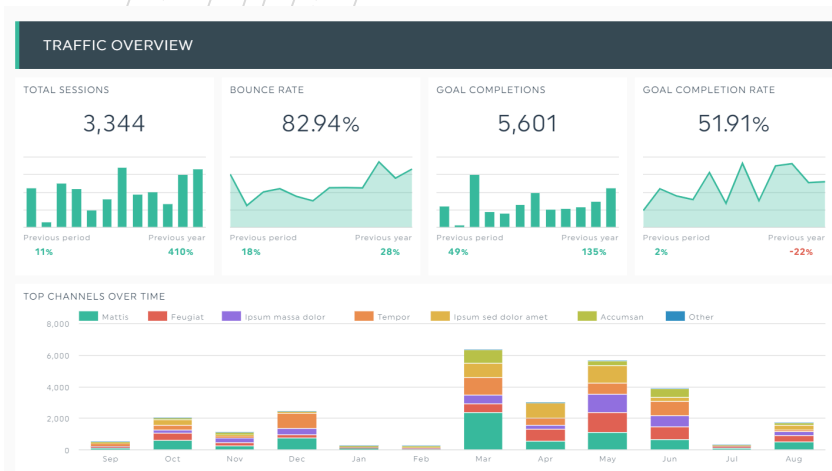
Demos & Wrap-Up

What is Data Visualization?

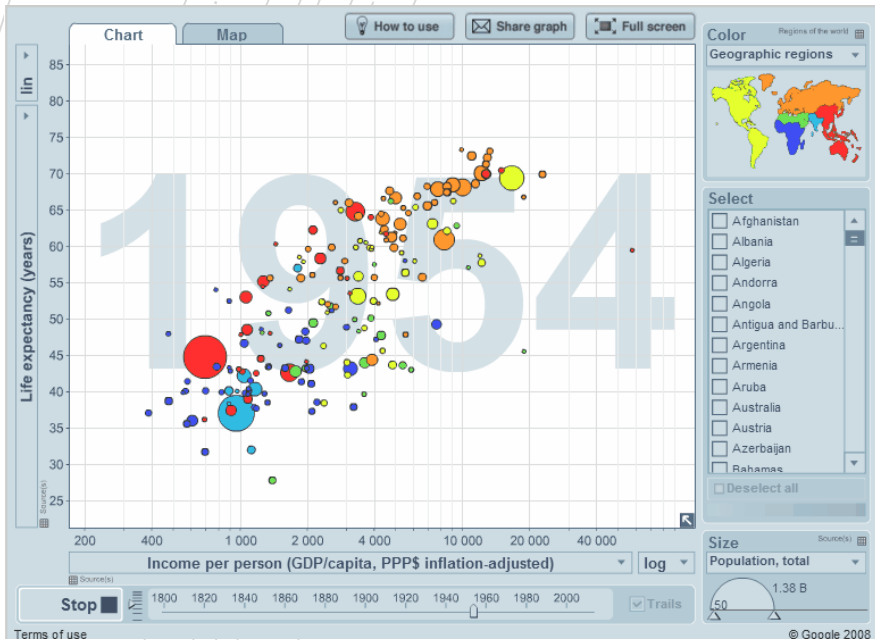
Data as images

Patterns jump out

Interactive



Why Data Visualization?

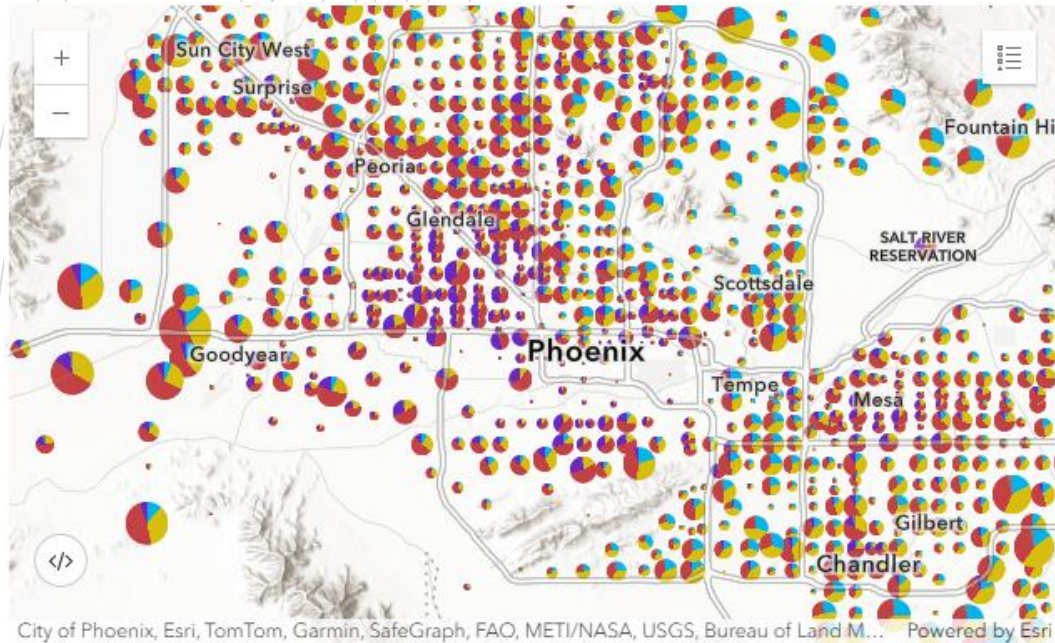


Humans process visuals
 $\approx 60\times$ faster than text

Charts reveal hidden
insights

Interactive visuals spark
questions

Common Use Cases



Data Dashboards



**Interactive
learning tools**



**Geospatial
mapping**

Bad Charts Game!

How to Play “Roast Fill-In” Showdown

1. Form teams of 2-3 people.
2. After each chart, write your fill-in-the-blank roast.
3. Vote for **one** other team's roast (no self-votes) – note: I'll break ties.
4. Winning roast = 1 pt. Most points after all charts wins!

Best Practices

Choose the
right chart

Label axes
& units

Use honest
scales

Apply
purposeful
color

Simplify &
focus

What is Chart.js?

JavaScript
charting library

Canvas-based

Open source +
lightweight



chartjs.org/docs

Why use Chart.js?



Easy to get started



Responsive by default



Clean design



Customizable

8 Chart Types in Chart.js



Bar



Line



Area



Pie &



Doughnut



Scatter



Bubble



Radar



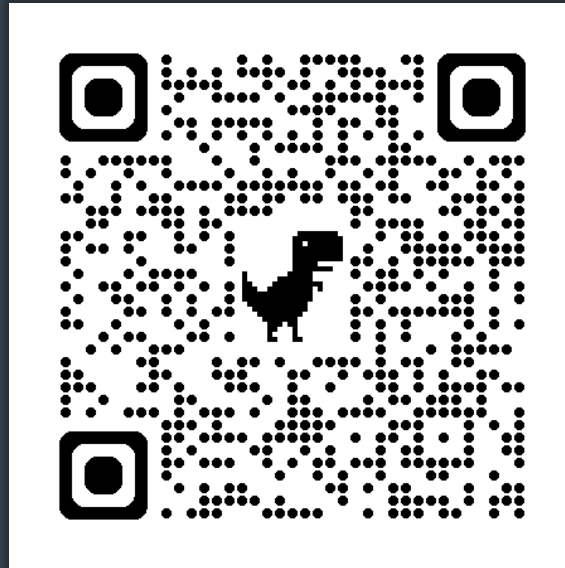
Polar
Area



Game Time



Guess the City by its Data!



chartjs-city-game.netlify.app

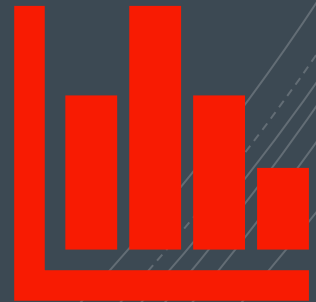
Chart.js Base Setup

- Load the library (CDN is simplest)
- Add a canvas
- Set up your config - with type and data
- Instantiate the chart



Bar Chart

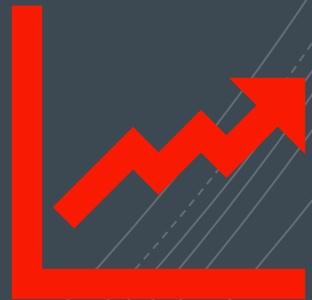
- Compare values across categories
- Vertical or horizontal bars
- Good for ranking or totals





Line Chart

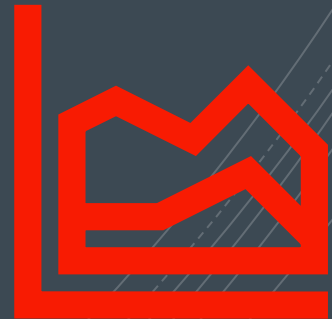
- Show change over time
- Points connected by lines
- Good for trends or growth





Area Chart

- Line chart with filled area
- Emphasizes volume
- Good for totals over time



Work on Module 1a-1b: Bar & Line/Area

Upload work here as we go through modules:
charts-workshop-submit.netlify.app

See all submissions:
charts-workshop-dashboard.netlify.app



Pie & Doughnut

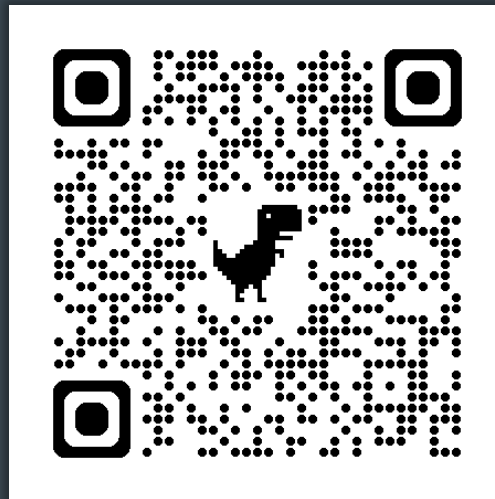


- Show parts of a whole
- Use for % or proportional data
- Doughnut has a hollow center



Work on Module 1c-1d: Pie & Doughnut

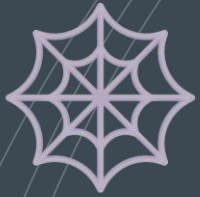
Upload work here as we go through modules:
charts-workshop-submit.netlify.app



Wayground Quiz - Choosing the Right Chart Type

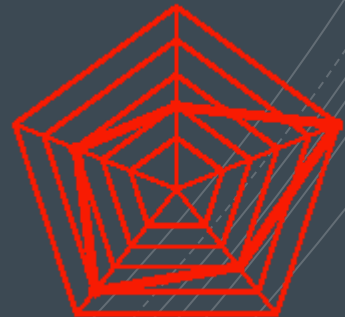
joinmyquiz.com





Radar Chart

- Values on multiple axes
- Forms a polygon
- Good for profiles or scores





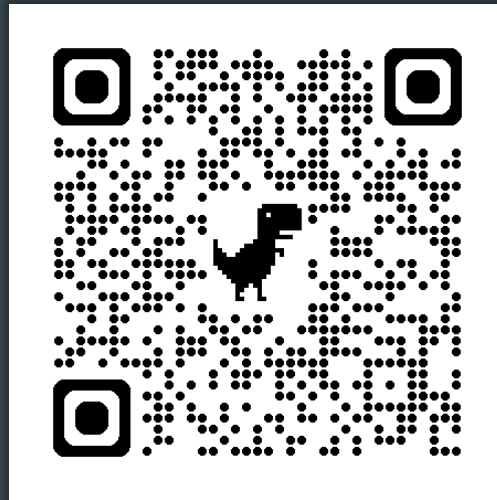
Polar Area Chart

- Like pie, but with radial scaling
- Segment size = value
- Good for categorical comparison



Work on Module 1e-1f: Radar & Polar

Upload work here as we go through modules:
charts-workshop-submit.netlify.app

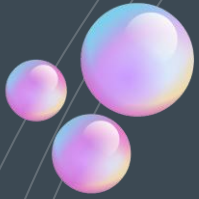




Scatter Chart

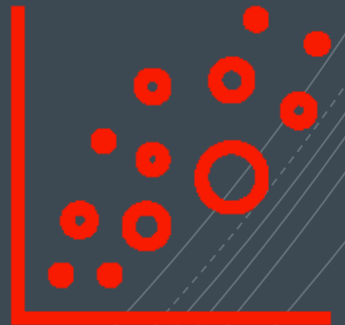
- X/Y data points
- Explore relationships
- No lines between points





Bubble Chart

- Like scatter, but with size
- 3 variables per point
- Good for impact or volume



Work on Module 1g-1h: Scatter & Scatter

Upload work here as we go through modules:
charts-workshop-submit.netlify.app



Chart.js Game

Gimkit

Demographic Stats Graph Code

codepen.io/cyatteau/pen/zzvdrBB

Data Sources

Static Data

- ✓ Hardcoded Arrays
- ✓ JSON Files (local, external, or live)

You can find good external JSON files here (no API key needed):

- Dog breeds: <https://dog.ceo/api/breeds/list/all>
- Crypto: https://api.coingecko.com/api/v3/simple/price?ids=bitcoin,ethereum&vs_currencies=usd
- Hourly forecast: https://api.open-meteo.com/v1/forecast?latitude=35&longitude=139&hourly=temperature_2m
- ArcGIS Hub: hub.arcgis.com



Data Snippets

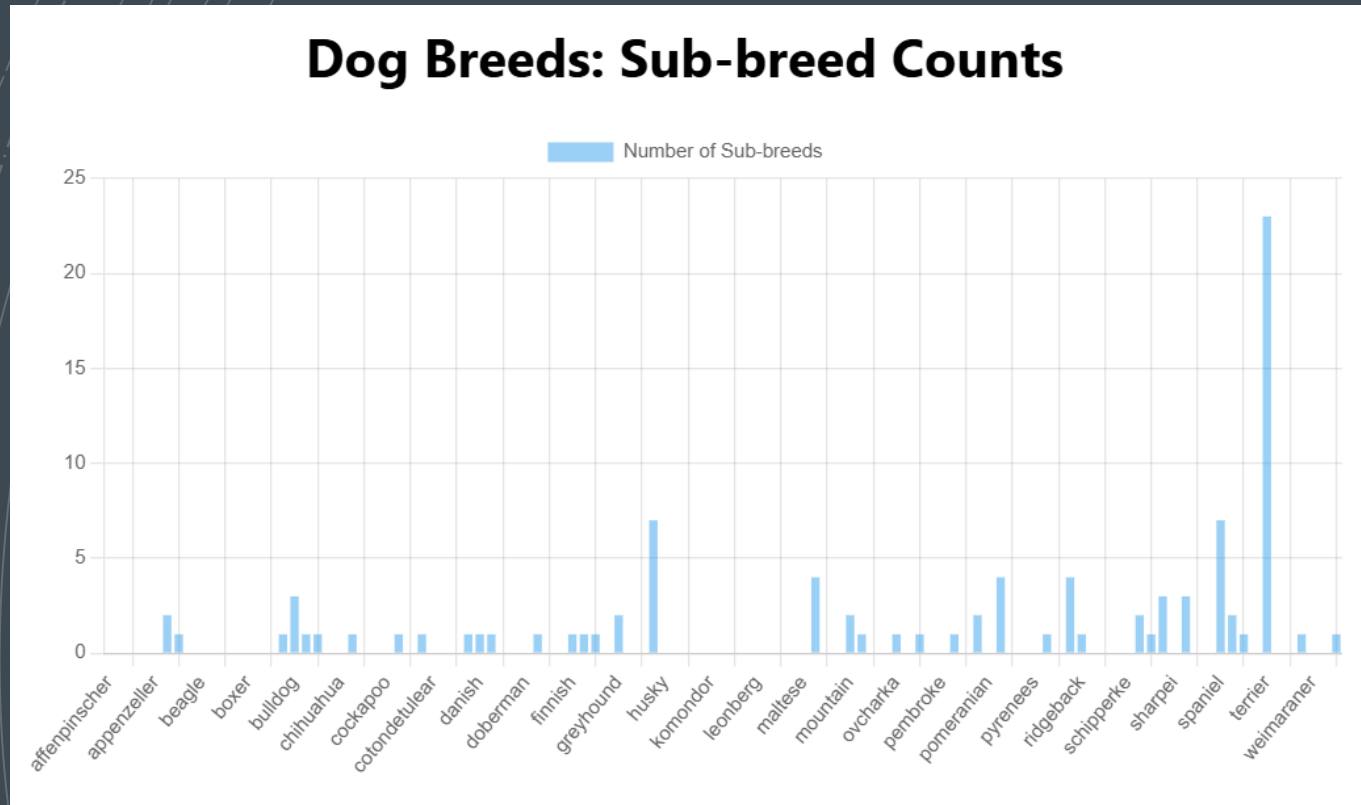
JSON

```
fetch('https://your-json-url.com')
  .then(r => r.json())
  .then(json => {
    const labels = ... // turn keys or values into label strings
    const values = ... // turn values or nested values into #s
    new Chart(ctx, {
      type: 'chartType',
      data: {
        labels,
        datasets: [{ data: values }]
      }
    });
  });
```

Static Data

```
data: {
  labels: [colors]
  datasets: [{
    data: [values],
  }]
}
```

Simple API + Chart.js Example



codepen.io/cyatteau/pen/zxvdobM

How to Search on ArcGIS Hub

- Go to hub.arcgis.com and search for something (e.g. a city name).
- In filters on the left, check Feature Service.
- Click an item. Then, click the item's View Data Source link.
- In the Directory that opens, look for your layer URL.
 - *If you don't see a /0/ in the path, click one of the layers listed under Layers until the URL ends with /0.*
- Copy that URL up through .../FeatureServer/0

Moule 1J – ArcGIS Hub URL + Chart.js

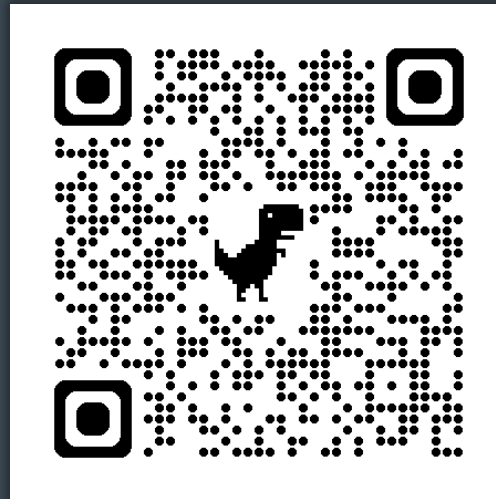
- Fork this [CodePen](#)
 - Swap in your own /query URL and outFields.
 - Update the field names in the .map(...) calls.
 - Tweak the chart type, labels and styling

Moule 1K – ArcGIS Hub URL + Chart.js

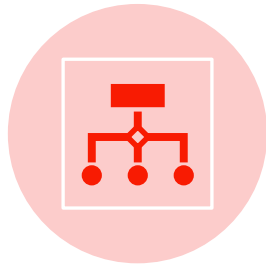
- Fork the [CodePen](#)
 - swap in any feature layer URL
 - Tweak the Chart.js config (type, axes, styling)

Work on Module 1J – 1K: Scatter & Scatter

Upload work here as we go through modules:
charts-workshop-submit.netlify.app



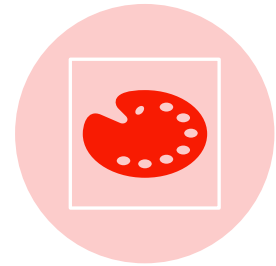
Introduction to D3.js



**D3.JS: DATA →
DOM/SVG**



**FULL CONTROL OF
VISUALS**



**OUTPERFORMS
CANVAS FOR
CUSTOM NEEDS**

D3.js vs Chart.js

Chart.js:
quick, built-in charts

D3.js: fully custom charts

Ideal for complex interactivity

Core D3.js Concepts



Selections



Data joins



Scales



Axes



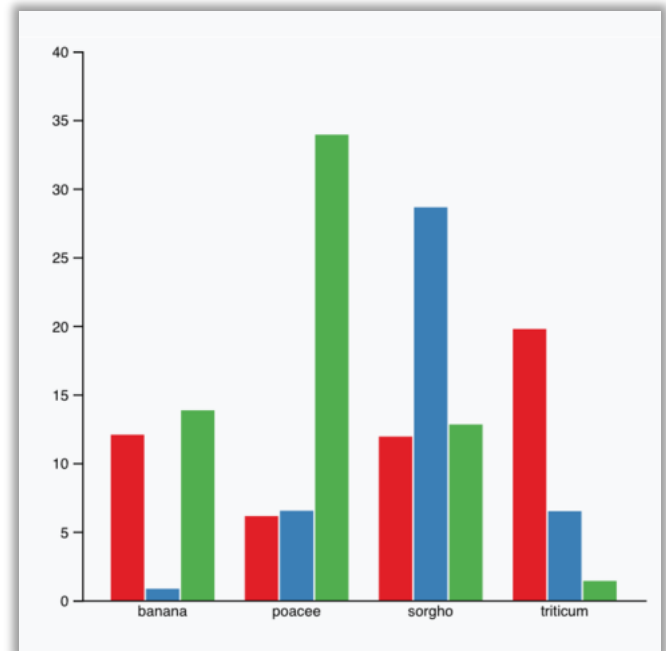
Mini D3.js Demos – Code together

- Open up a codepen or a simple html file in your IDE.

Bar Charts

Rectangular bars
show category
values

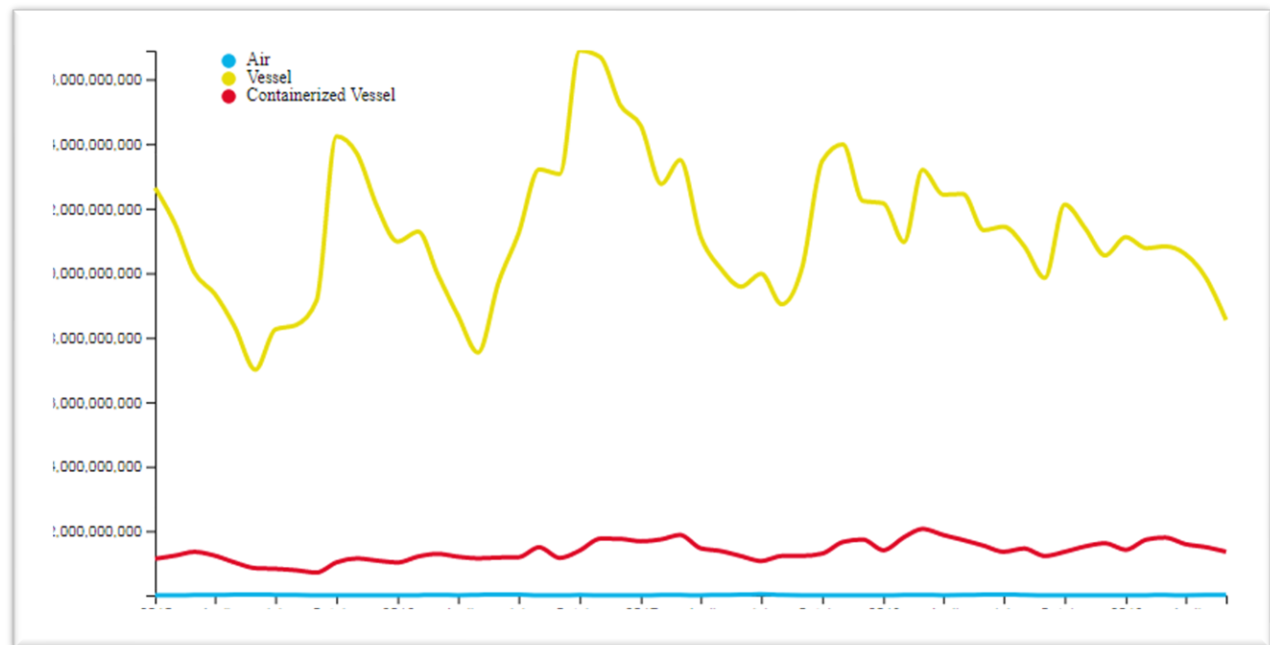
SVG `<rect>` D3
scales/axes

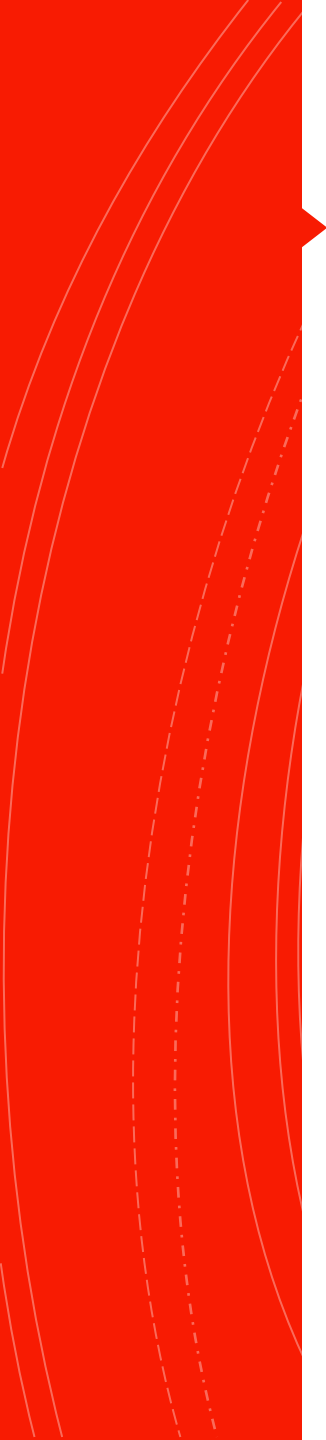


Line Charts

Lines show trends

Custom curve options





Module 2a-2b – Bar & Line Charts

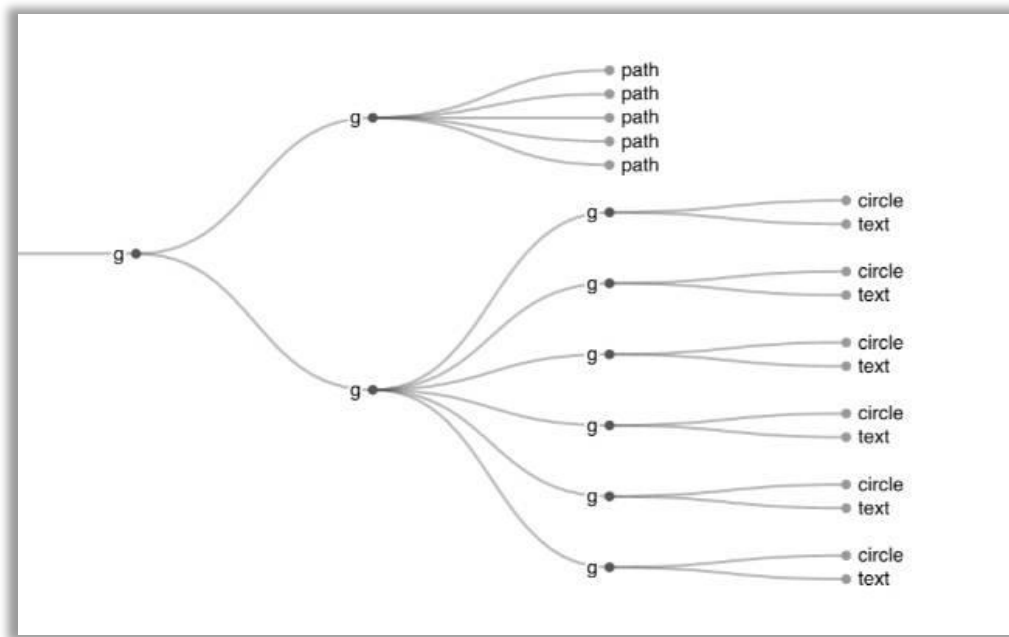
Wayground Quiz - D3.js Bar and Line Charts

joinmyquiz.com



Hierarchical Layouts

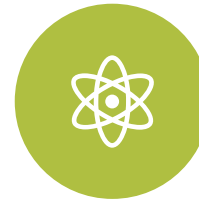
- Circle packing
- Tree & sunburst layouts



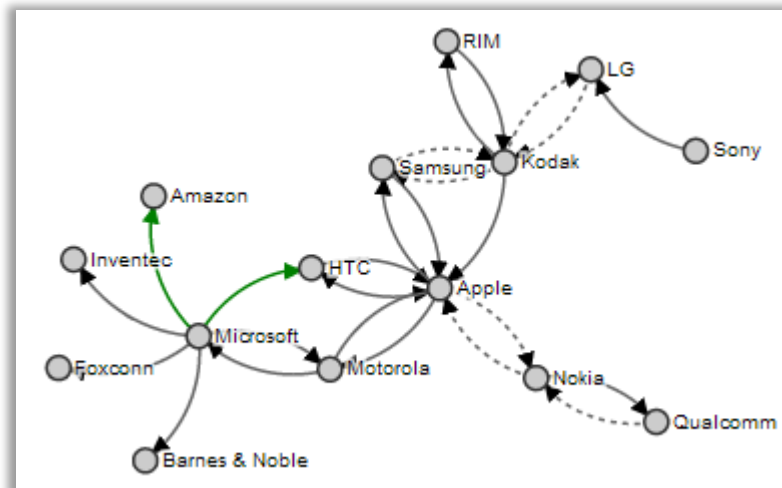
Force-Directed Graphs



**NODES &
LINKS**



**PHYSICS-BASED
LAYOUT**

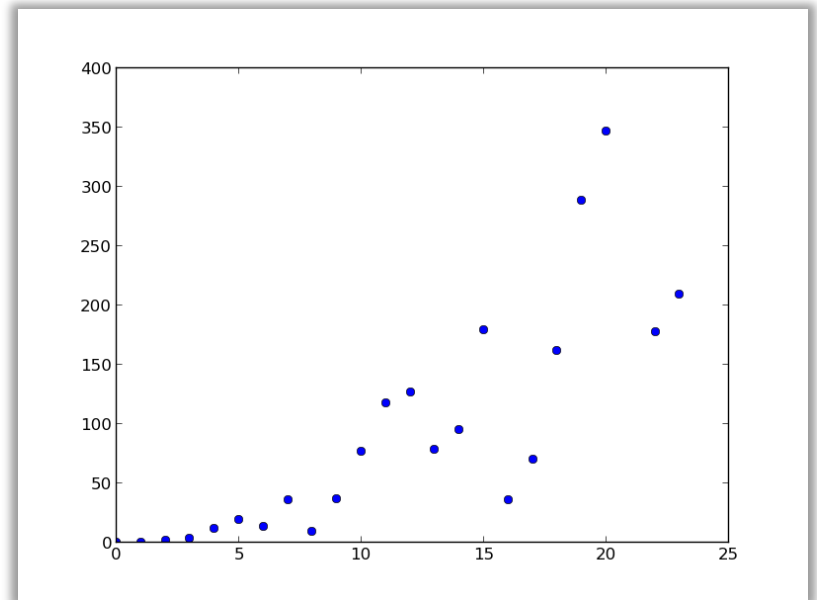




Module 2c-2d – Hierarchical Layouts & Force-Directed Graphs

Transitions & Animations

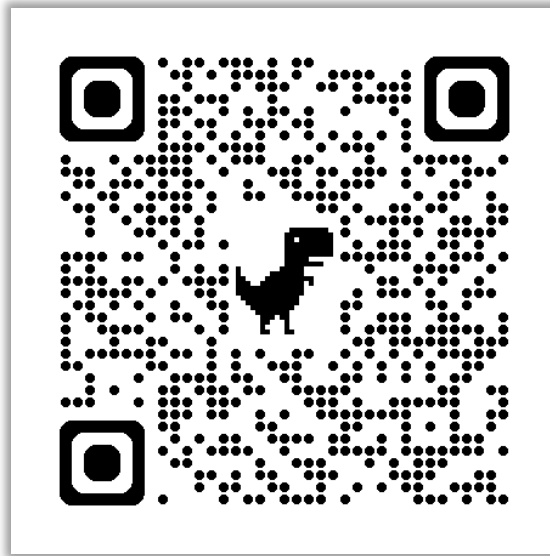
- Animate updates
- Chain & ease



➤ Scales & Axes Deep Dive

- Map data to pixels
- Built-in axis generators

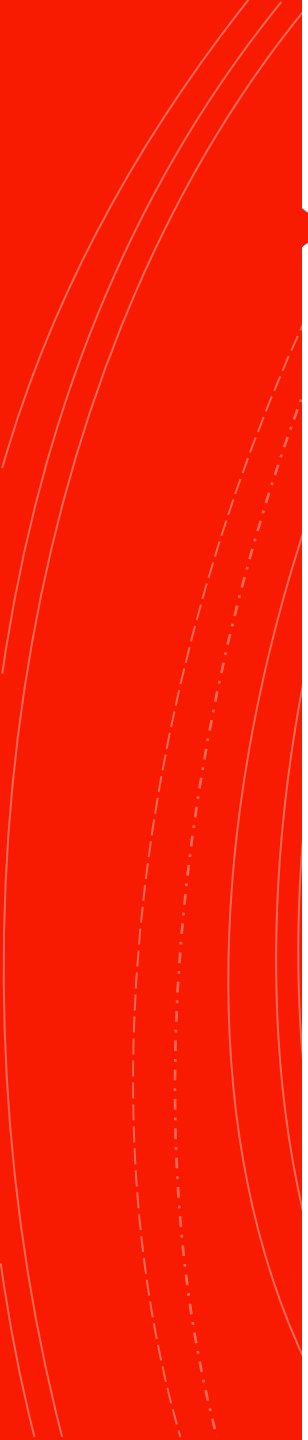
D3 Axis Relay Challenge



d3-axis-relay.netlify.app






Module 2e-2f – Transitions & Animations & Scales & Axes



Extend your learning D3.js mathematical demos

codepen.io/collection/dGkZOV

What You Just Learned + Where to Go

-  You mastered the D3 building blocks:
- Selections, data joins, scales, transitions
-  Use ``steps/index.html`` to review simple concepts anytime
-  Try using your own numbers or styles



D3.js Game Gimkit

A large red speech bubble graphic with a white outline, pointing downwards. It contains the text 'Final Project Planning' in white. Above it is a smaller red rectangular bar.

Final Project Planning

- Form teams (2–3)
- Sketch storyboard
- Select datasets & roles

STUCK? Here's some ideas...

on the next slide...

STUCK? Here's some ideas...

■ **Interactive Climate Dashboard**

- Use Chart.js for time-series (temp, precipitation) + D3 small multiples or event network.
- **Data (free):** NOAA Climate Data Online, NASA GISS Surface Temperature Analysis.

■ **Sports Performance Analyzer**

- Chart.js trend charts (batting avg, ERA) + D3 radar/spider plots or shot-map style visuals.
- **Data (free):** Lahman Baseball Database (public domain).

■ **Earthquake Visualizer**

- Chart.js for magnitude/time plots + D3 geo-map or bubble chart showing quakes by location.
- **Data (free):** USGS Earthquake Catalog API (no key required).

■ **Financial Portfolio Simulator**

- Chart.js growth curves + D3 sunburst or treemap for asset breakdown.
- **Data (free):** Yahoo Finance CSV downloads of historical stock prices.

■ **Personal Fitness Tracker**

- Chart.js daily/weekly activity trends + D3 calendar heatmap or gauge.
- **Data (free):** UCI Human Activity Recognition Using Smartphones dataset.

The background features a series of concentric circles in light gray, some solid and some dashed, creating a sense of depth and movement. A large, solid red circle is positioned in the upper right quadrant, serving as a focal point. A dark gray, curved, teardrop-shaped element is located to the left of the red circle, pointing towards it.

Final Project Building
Time



Key Takeaways

- Chart.js → quick wins
- D3.js → full control

Resources

D3.js

- Official docs: <https://d3js.org/> d3js.org
- Observable Gallery (live examples):
<https://observablehq.com/@d3/gallery>
[Observable](https://observablehq.com/@d3/gallery)
- Scott Murray's Interactive Data Visualization for the Web:
<https://scottmurray.org/work/d3-book>
scottmurray.org

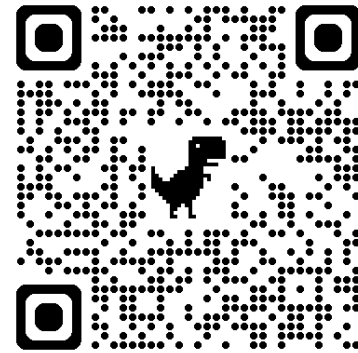
Chart.js

- Official docs:
<https://www.chartjs.org/docs/latest/>
[chartjs.org](https://www.chartjs.org)
- Samples gallery:
<https://www.chartjs.org/samples/>
[chartjs.org](https://www.chartjs.org)
- Awesome Chart.js (plugins & community resources):
<https://github.com/chartjs/awesome>
github.com

Thank You to Our Sponsors



Thank you,
Beer City
Code!



[github.com/cyatteau/
charts-workshop-
bcc2025](https://github.com/cyatteau/charts-workshop-bcc2025)

Courtney Yatteau

  @c_yatteau

 [courtneyyatteau](https://www.linkedin.com/in/courtneyyatteau)

 @cyatteau.bsky.social