Introduction to Scales, D3, and Everything Else

Now that we've seen the basics of D3, let's see if we can put them to use. To complete each question, open up the appropriate `.js` file and edit it.

Your finished homework should look like homework-completed.pdf.

There are **multiple hints** for each question inside of the `hints/` directory. Each problem has an associated text file.

When you run into trouble:

- **FORCE REFRESH** with shift+refresh
- Make sure you've run the linter in your text editor
- Check the console for error messages
- If all else fails, teaching assistants and `#storytelling` can help!

Make sure you're **running a server**, and looking at your page on localhost! You only need it for question 9 and on, but your console will be cluttered with errors otherwise.

Baby-sized scale reference

There are a lot of scales in D3, and of course the documentation sucks so this might be enough for now.

Scale	Inputs	Typical outputs	Example
`scaleLinear()`	Numbers	Numbers or color range	Age of a pandas bear becomes length of a bar Higher pollution levels become a greener dot
`scaleBand()`	Categories	Bar position/size	Spacing out bars based on names of senators

Scale	Inputs	Typical outputs	Example
`scaleOrdinal()`	Categories	Colors (list of specific ones)	Republicans are red Democrats are blue
`scaleSqrt()`	Numbers	Radius of circle	Age of a tree becomes size of a circle
`scalePoint()`	Categories	Evenly spaced out	It's like a `scaleBand`, but for spacing out points/circles instead of bars

Remember, all scales want a `domain` and a `range`!

...except `scaleOrdinal`, but you aren't supposed to know that yet.

1. A couple scales

You need to fix some scales for me. I will eventually have several people of various heights, and will use a rectangle to represent each of them.

- `widthScale`: people are between 0 and 200cm tall, and I would like my longest bar to be 400 pixels
- `colorScale`: I would like the gender of `man` to be `#BDB76B`, `woman` to be `#ADFF2F`.

Update the `domain` and `range` of the `widthScale` and `colorScale`.

2. Working on some bars

I have a few bars that stand for different countries in the world, but it needs some improvement.

- **Using d3**, change the SVG itself to be 400 pixels wide and 200 pixels tall
- Every bar should be 50 pixels tall
- Every bar's `width` should be related to the gdp of the country. If the gdp is 100, it should be as wide as the SVG.
- Every bar's color should be related to the continent. Get your colors from Colorbrewer.

3. A circle chart

I have a few circles that I need to space out and resize. I would like...

- Every circle's `cy` to be the **vertical center of the graph**
- Each circle to be evenly spaced out on the x axis. This uses a `d3.scalePoint`, which we didn't talk about in class. Check the `hints/` folder.
- Each circle's size to reflect the weight of the animal. If an animal were 1000 lb, it should have a radius of 50.

4. A fake, ugly scatterplot

Build me a graph! I didn't give you any circles to start with, though, so how are you going to add new ones? Check out `hints/`

And be sure that **yours match mine**, y position is going to be tricky

- **Mark:** circle
- **Data:** hamburgers consumed, **Visual representation:** x axis
- **Data:** hot dogs consumed, **Visual representation:** y axis
- With light pink circles

5. A fake, ugly bubble chart

Build me a chart...

- That is 400 pixels wide and 200 pixels tall
- Every circle is halfway down the SVG
- **Data:** hamburgers consumed, **Visual rep:** x axis
- **Data:** kind of animal, **Visual rep:** color @ölǐöřš aře ỳöùř cẗöice#
- **Data:** hot dogs consumed, **Visual rep:** radius @ḿaẋ šiźe iš ỳöùř cẗöice#
- With an opacity of `0.5`

6. A couple scales

You need to fix some scales for me. I will eventually have several people of various heights, and will use a rectangle to represent each of them.

- `widthScale`: people are between 0 and 200cm tall, and I would like my longest bar to be 400 pixels
- `colorScale`: I would like the gender of `man` to be `#BDB76B`, `woman` to be `#ADFF2F`.

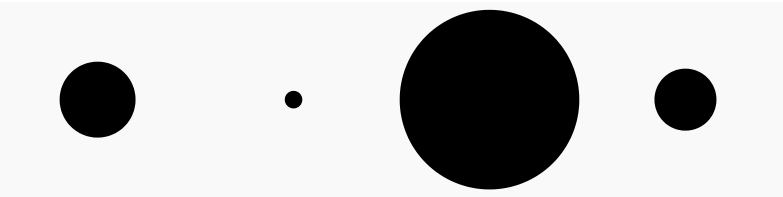
Update the `domain` and `range` of the `widthScale` and `colorScale`.

```
[redacted]
```

7. Appending a fancy SVG with a margin

Right now I add an SVG inside of this chart in a very simple way, but it doesn't give me the fancy margins we had at some point in life.

Adapt the code from class, changing this SVG to be 400 pixels wide, 200 pixels tall, with a 50 pixel margin the rectangle inside. Dön̰̰̰



9. Reading external data

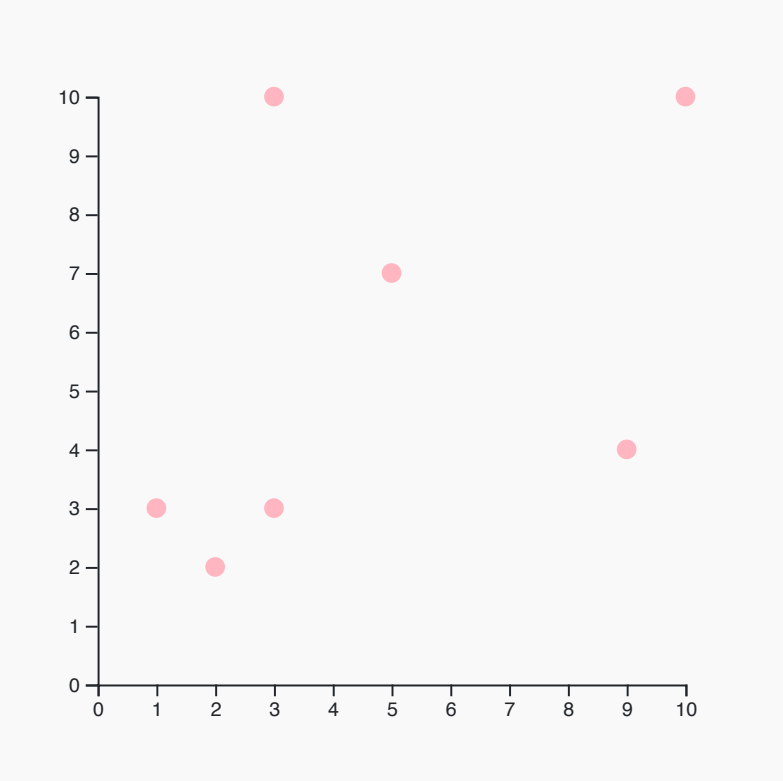
Run a server and open this file. If you do it correctly, the box below will turn green.

10. Scatterplots

Build me a graph...

- That is 400 pixels wide and 400 pixels tall, margin is up to you
- **Mark:** circle
- **Data:** hamburgers consumed, **Visual rep:** x axis
- **Data:** hot dogs consumed, **Visual rep:** y axis
- With light pink circles
- Has axis labels

The data being read is eating-data.csv

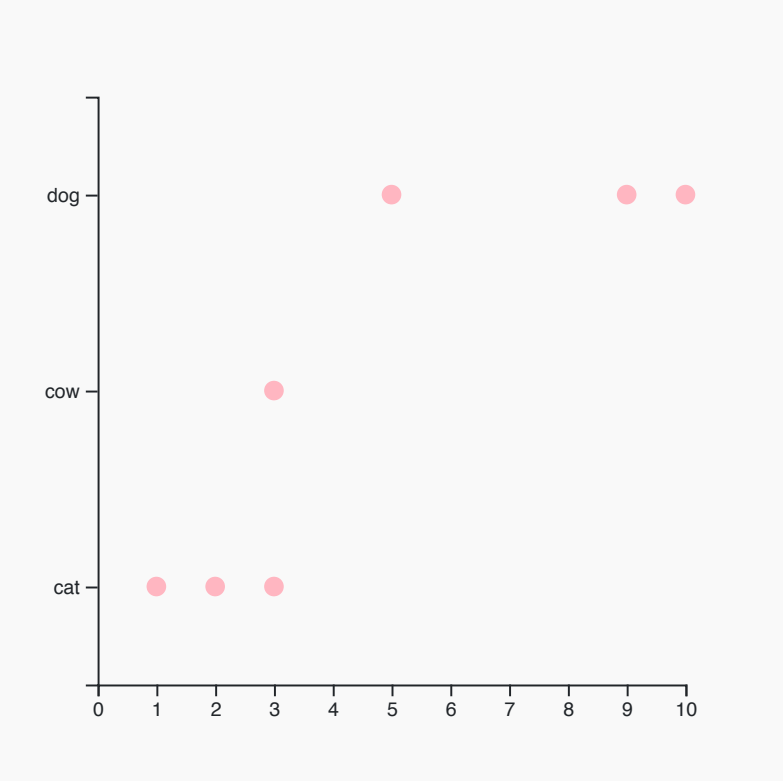


11. Categorical scatterplot

Build me a graph...

- That is 400 pixels wide and 400 pixels tall, margin is up to you
- **Mark:** circle
- **Data:** hamburgers consumed, **Visual rep:** x axis
- **Data:** kind of animal, **Visual rep:** y axis
- With light pink circles
- Has axis labels
- Has a little padding between the categories and the x axis label. Maybe 25% padding or so.

The data being read is eating-data.csv

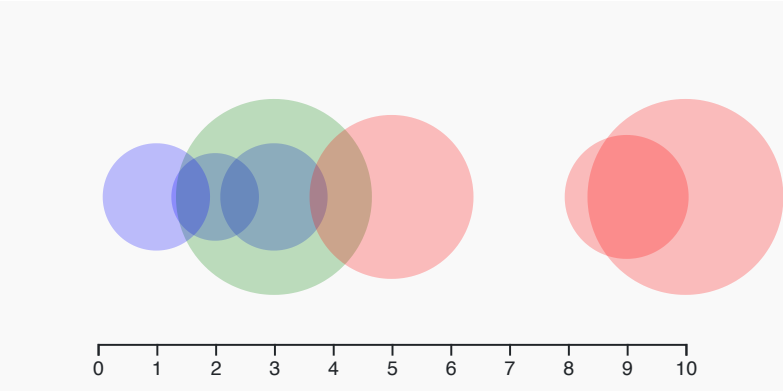


12. Weird colored bubble chart

Build me a graph...

- That is 400 pixels wide and 200 pixels tall, margin is up to you
- **Mark:** circle
- **Data:** hamburgers consumed, **Visual rep:** x axis
- **Data:** kind of animal, **Visual rep:** color @öĺöřš aře ỳöùř cẗöice#
- **Data:** hot dogs consumed, **Visual rep:** radius @ḿaẋ šiźe iš ỳöùř cẗöice#
- With an opacity of `0.25`
- Has the x axis labeled

The data being read is eating-data.csv

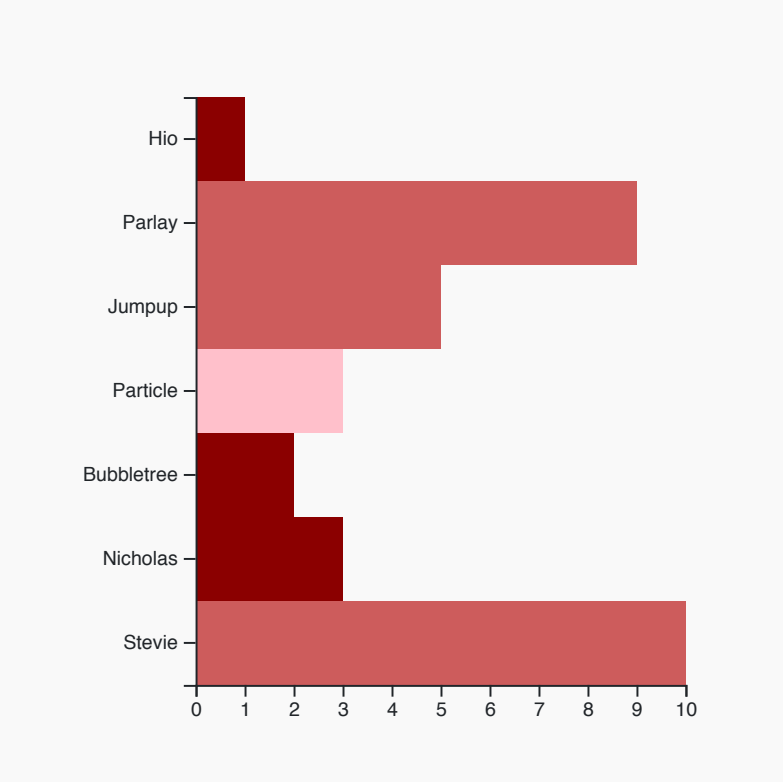


13. Horizontal bar graph

Build me a graph...

- That is taller than it is wide. Margin is up to you
- **Mark:** rectangles
- **Data:** hamburgers consumed, **Visual rep:** height
- **Data:** kind of animal, **Visual rep:** color
- Has a axis labels on the y axis
- Adjust your margins so I can see the full names on the left

!!! Read the hints for how to do the y axis !!! The data being read is eating-data.csv

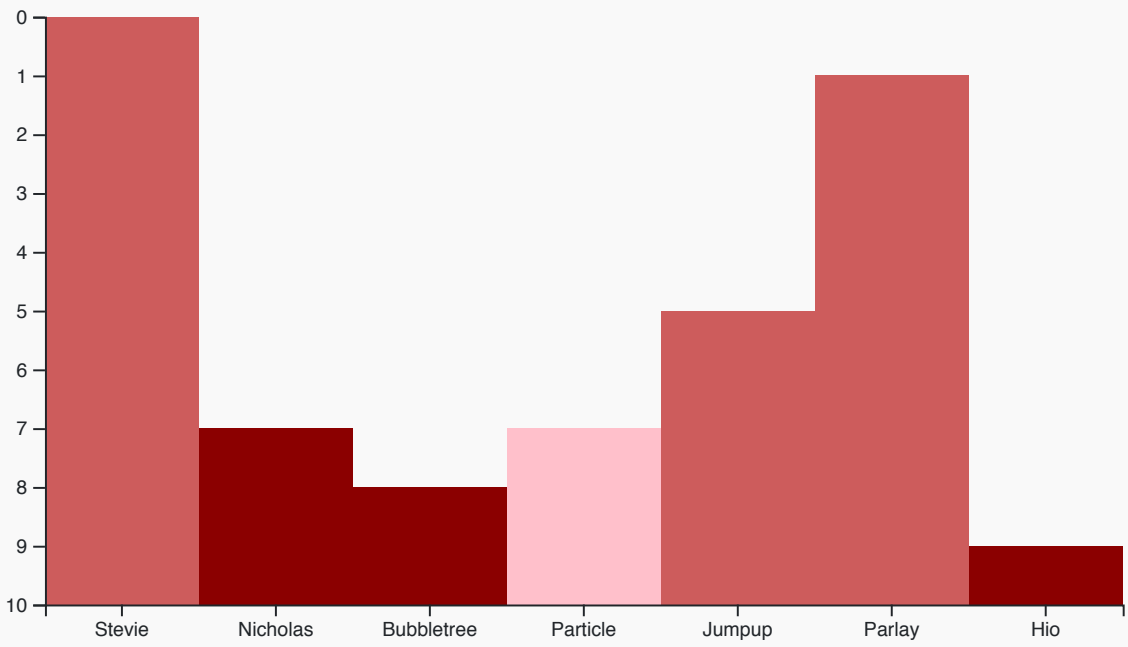


14. Vertical bar graph

Build me a graph...

- That is wider than it is tall. Margin is up to you
- **Mark:** rectangles
- **Data:** hamburgers consumed, **Visual rep:** height
- **Data:** kind of animal, **Visual rep:** color
- Has the bars lined up at the bottom
- Has a axis labels on the y axis

The data being read is eating-data.csv


0
1
2
3
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5
6
7
8
9
10
Stevie
Nicholas
Bubbletree
Particle
Jumpup
Parlay
Hio