

Chapter 3, Episode 3: Assistive barriers

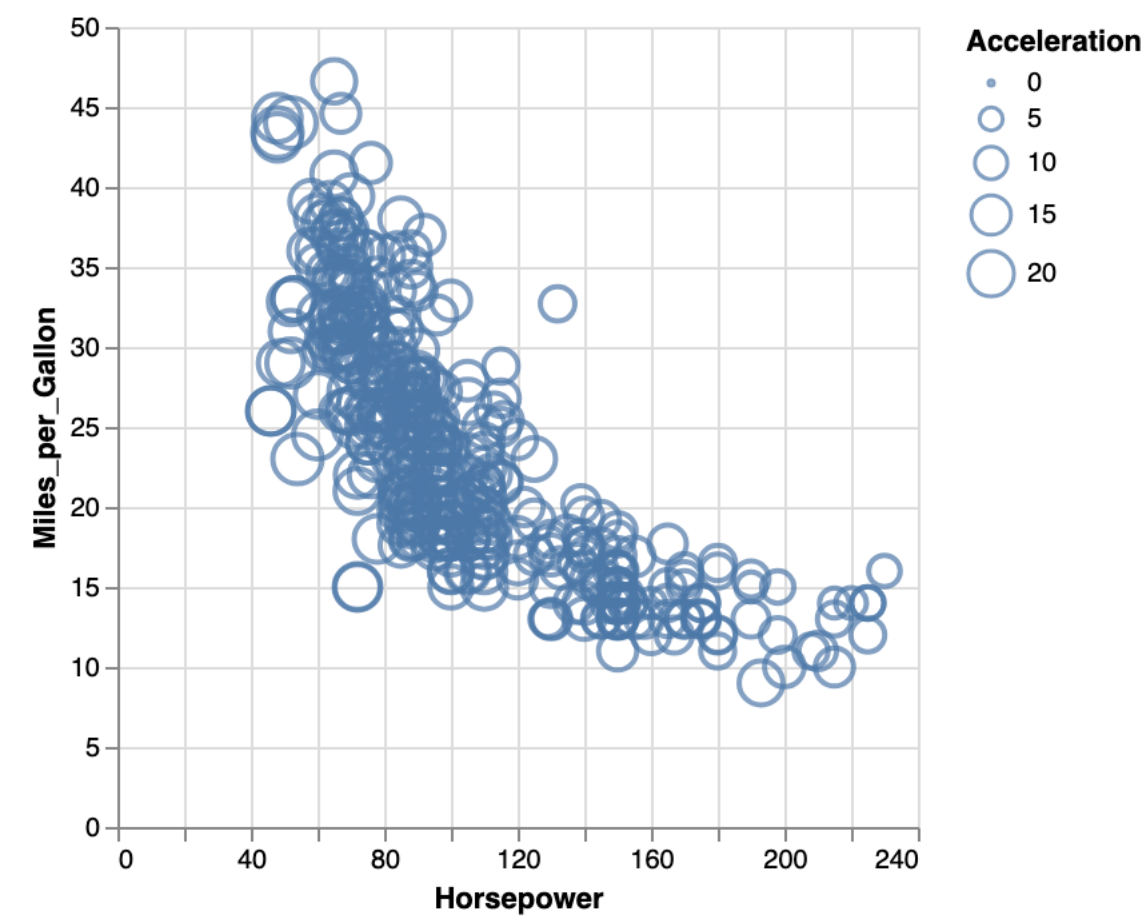
Assistive

Does the user have ways to reduce tedium as-needed, without losing informational fidelity, data signal, and ground truth?

Reducing tedium (for your users, not just you)

Bubble Plot

A bubbleplot showing horsepower on x, miles per gallons on y, and binned acceleration on size.



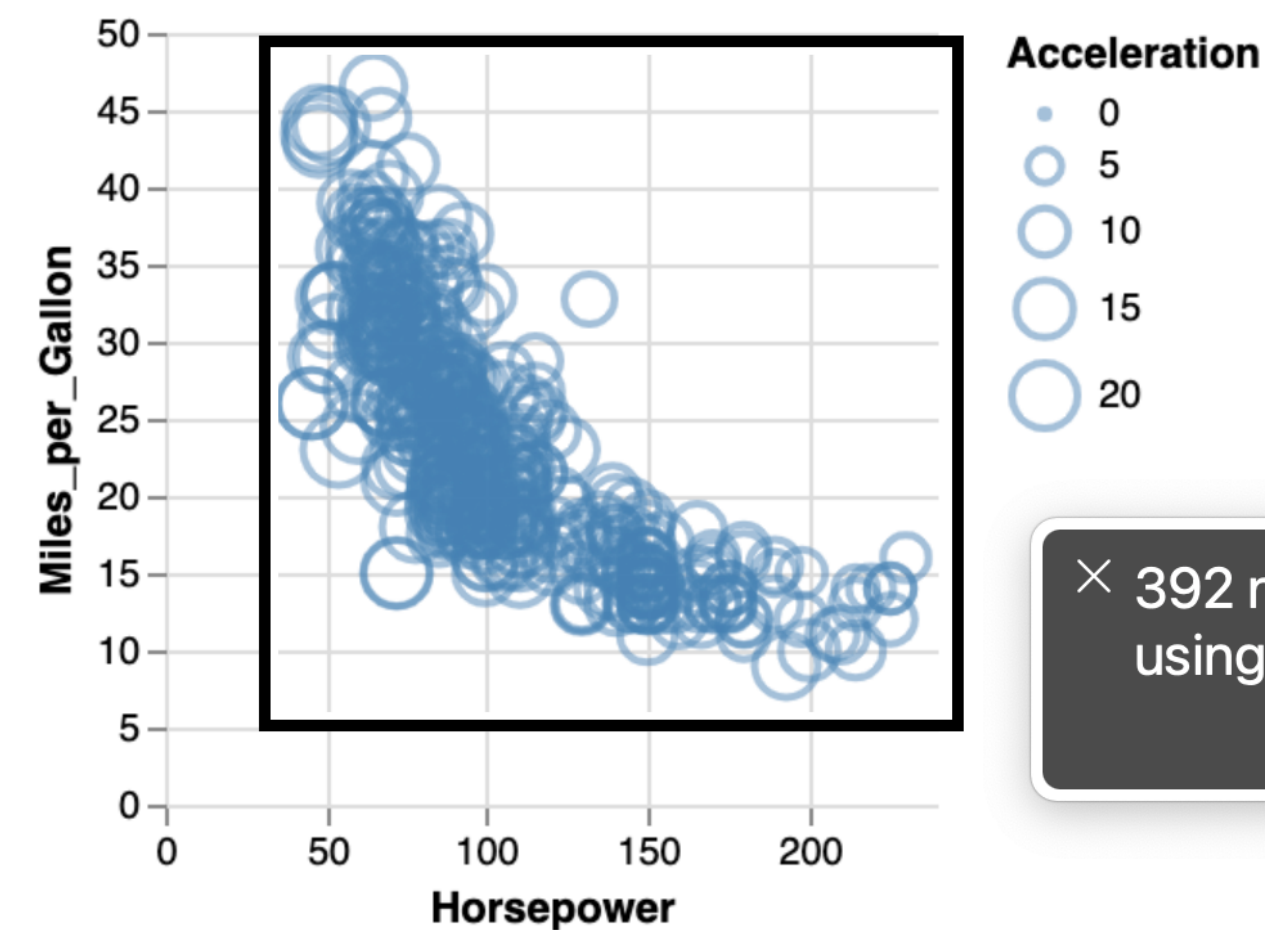
Source: [Vega-lite, bubble plot](#)

Smarter navigation: *skip-ability*

Data Navigator Vega-Lite Examples

Hi! Welcome to our testing area :)

Enter navigation area

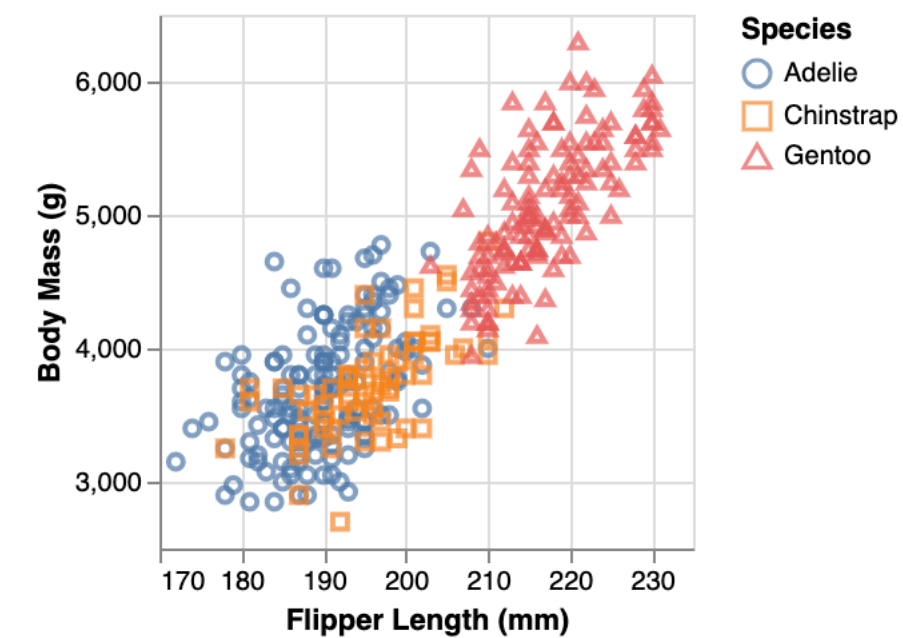


× 392 navigable data elements. Group. Enter using Enter Key., figure

Source: [Data Navigator](#), by Elavsky et al

Adding statistical summaries

Vega-Lite Visualization:



Olli tree view:

A scatterplot. With axes Flipper Length (mm) and Body Mass (g).

X-axis titled Flipper Length (mm). For a quantitative scale. With values from 172 to 231. The average value for the Flipper Length (mm) field is 201, the maximum is 231, and the minimum is 172.

Y-axis titled Body Mass (g). For a quantitative scale. With values from 2700 to 6300. The average value for the Body Mass (g) field is 4202, the maximum is 6300, and the minimum is 2700.

Legend titled Species. For a nominal scale. With 3 values from Adelie to Gentoo. The average value for the Flipper Length (mm) field is 201, the maximum is 231, and the minimum is 172.

1 of 3. Species equals Adelie. 151 values. The average value for the Flipper Length (mm) field is 190, the maximum is 210, and the minimum is 172. Press t to open table.

2 of 3. Species equals Chinstrap. 68 values. The average value for the Flipper Length (mm) field is 196, the maximum is 212, and the minimum is 178. Press t to open table.

3 of 3. Species equals Gentoo. 123 values. The average value for the Flipper Length (mm) field is 217, the maximum is 231, and the minimum is 203. Press t to open table.

Source: [Olli](#), by Blanco et al

Adding *rich* sonification

```
1 {
2   "description": "A histogram of Miles_per_Gallon",
3   "data": {
4     "url": "../data/cars.json"
5   },
6   "tone": {
7     "continued": false
8   },
9   "encoding": {
10    "time": {
11      "field": "Miles_per_Gallon",
12      "type": "quantitative",
13      "bin": true,
14      "scale": {
15        "length": 4.5
16      },
17      "tick": {
18        "interval": 0.5,
19        "playAtTime0": true
20      }
21    },
22    "pitch": {
23      "aggregate": "count",
```

Audio Graph Player

Play Stop Play scales Stop playing scales

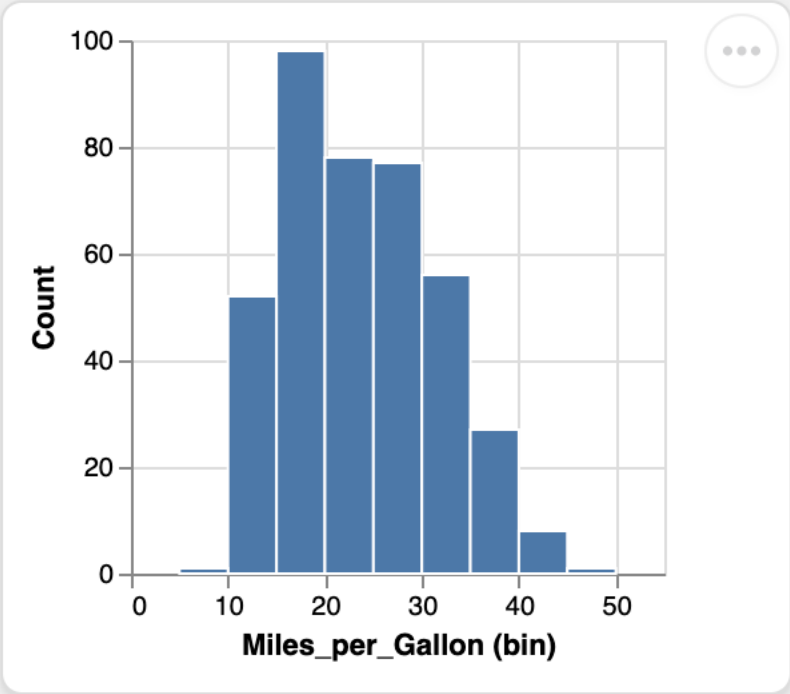
Audio queue list (at 10)

9. tone series Play this only Play from this

#	time	duration	timbre	pitch	detune	loudness	pan	postReverb	sp
0	0	0.5	default	207.65	-	-	-	0	-
1	0.5	0.5	default	939.71	-	-	-	0	-
2	1	0.5	default	1600	-	-	-	0	-
3	1.5	0.5	default	1312.92	-	-	-	0	-
4	2	0.5	default	1298.56	-	-	-	0	-
5	2.5	0.5	default	997.13	-	-	-	0	-
6	3	0.5	default	580.86	-	-	-	0	-
7	3.5	0.5	default	308.13	-	-	-	0	-
8	4	0.5	default	207.65	-	-	-	0	-

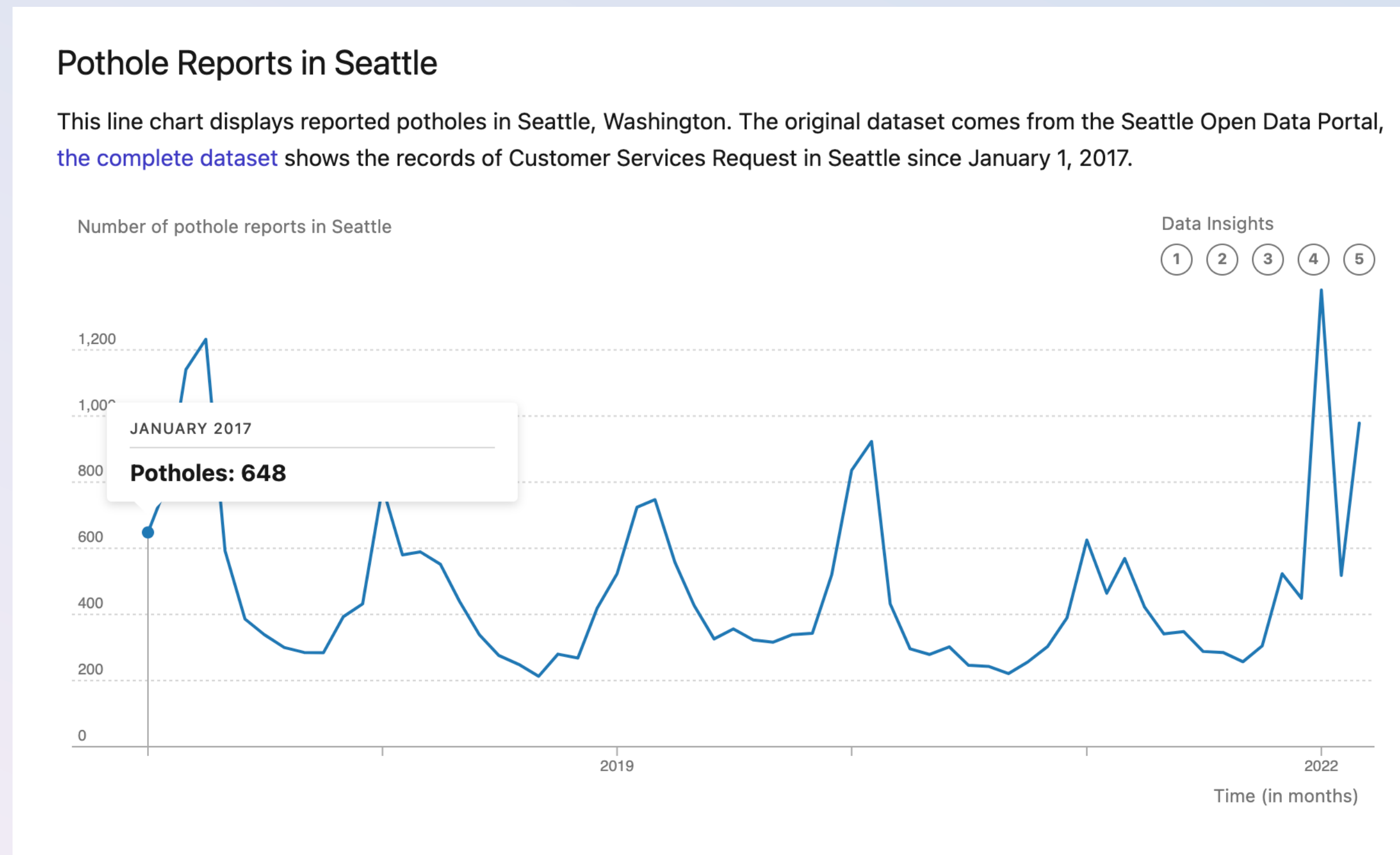
10. text Play this only Play from this

Visualization



Miles_per_Gallon (bin)	Count
10	50
15	95
20	75
25	75
30	55
35	25
40	10

Skip-ability, summarization, *and* sonification



Source: [Chart Reader](#), by John Thompson

Assistive Evaluation Toolkit:

1. Are you reducing *tedium*?

1. Are you reducing tedium *for your user* or just for yourself?
2. Add helpful navigation (eg [Data Navigator](#))
3. Add descriptive statistics (eg [Olli](#))
4. Add sonification (eg [Erie](#))

2. Is your *assistive access* also *compromising*? (Have you provided multiple ways to gain assistance? (eg [Chart Reader](#))