

lecture 06: filtering data and 2-D charts

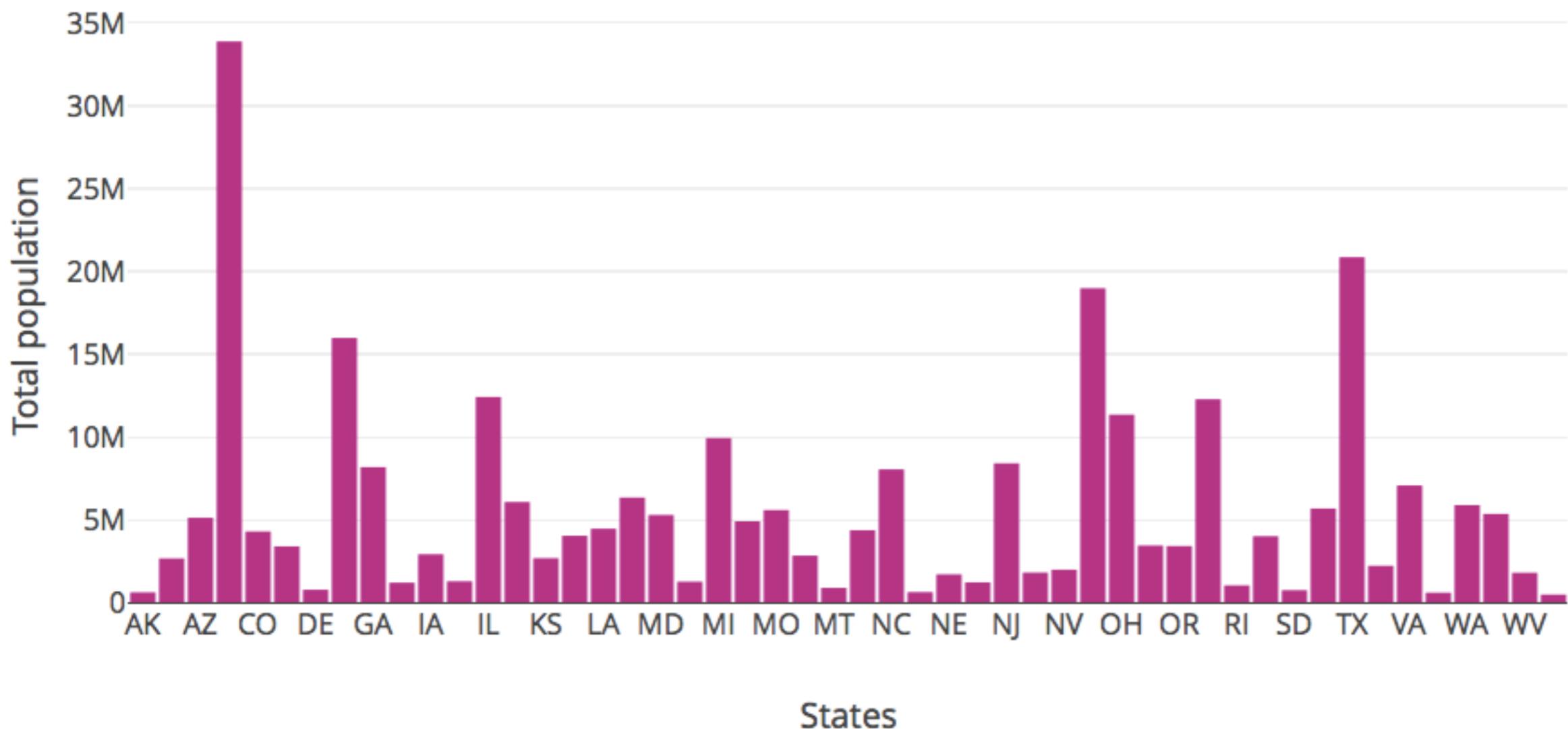
October 2, 2017

Let's start by looking at
some of your #lab2 work!

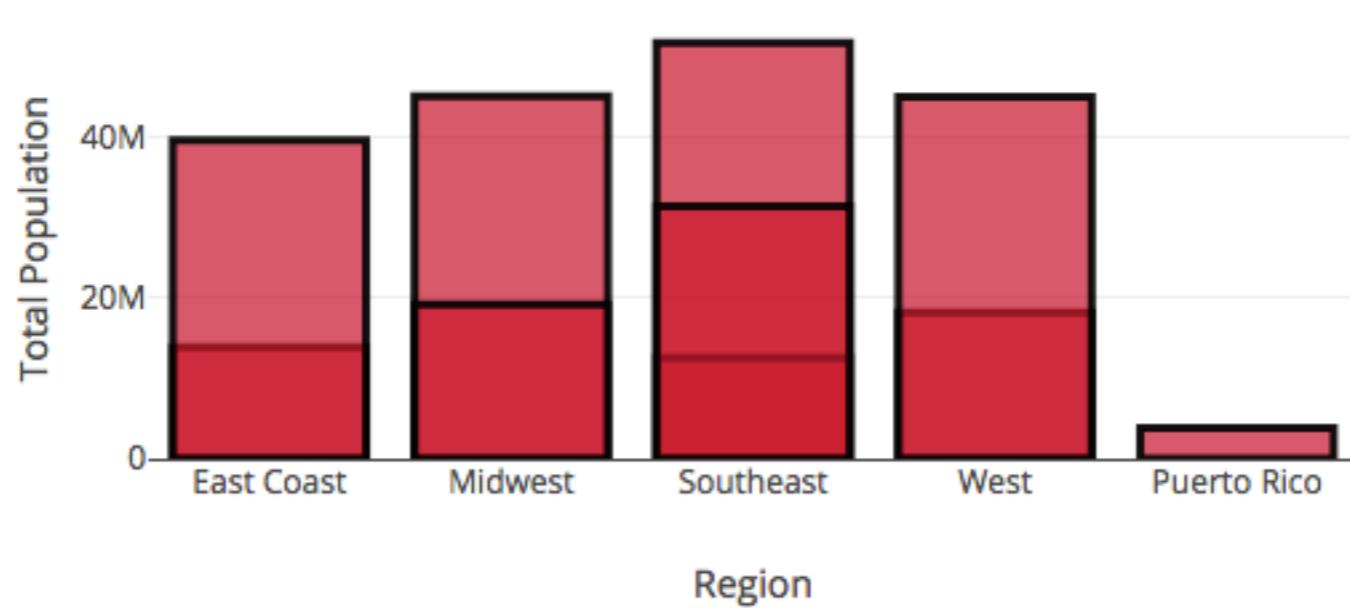
Total Population in Each Region



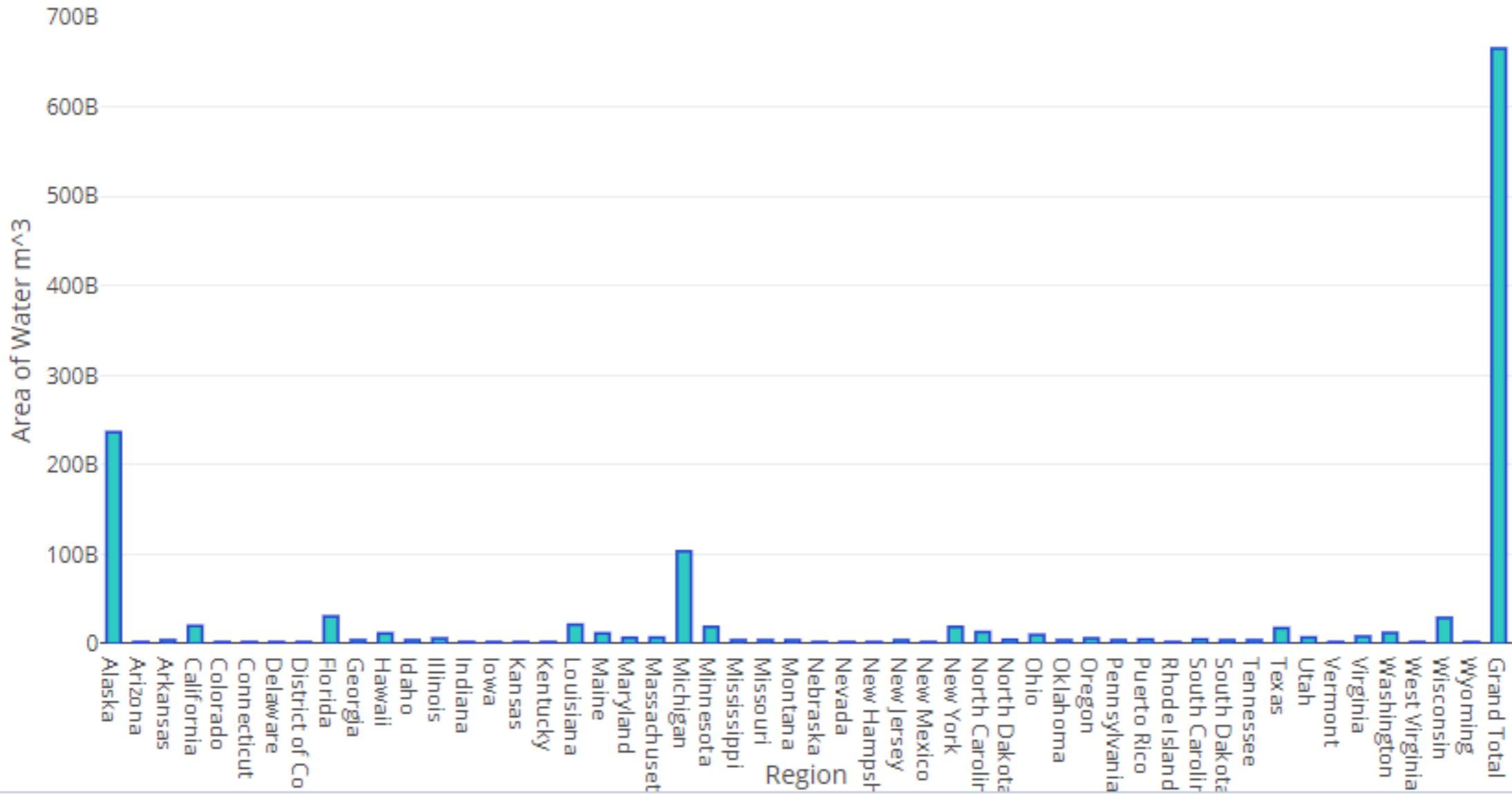
Click to enter Plot title

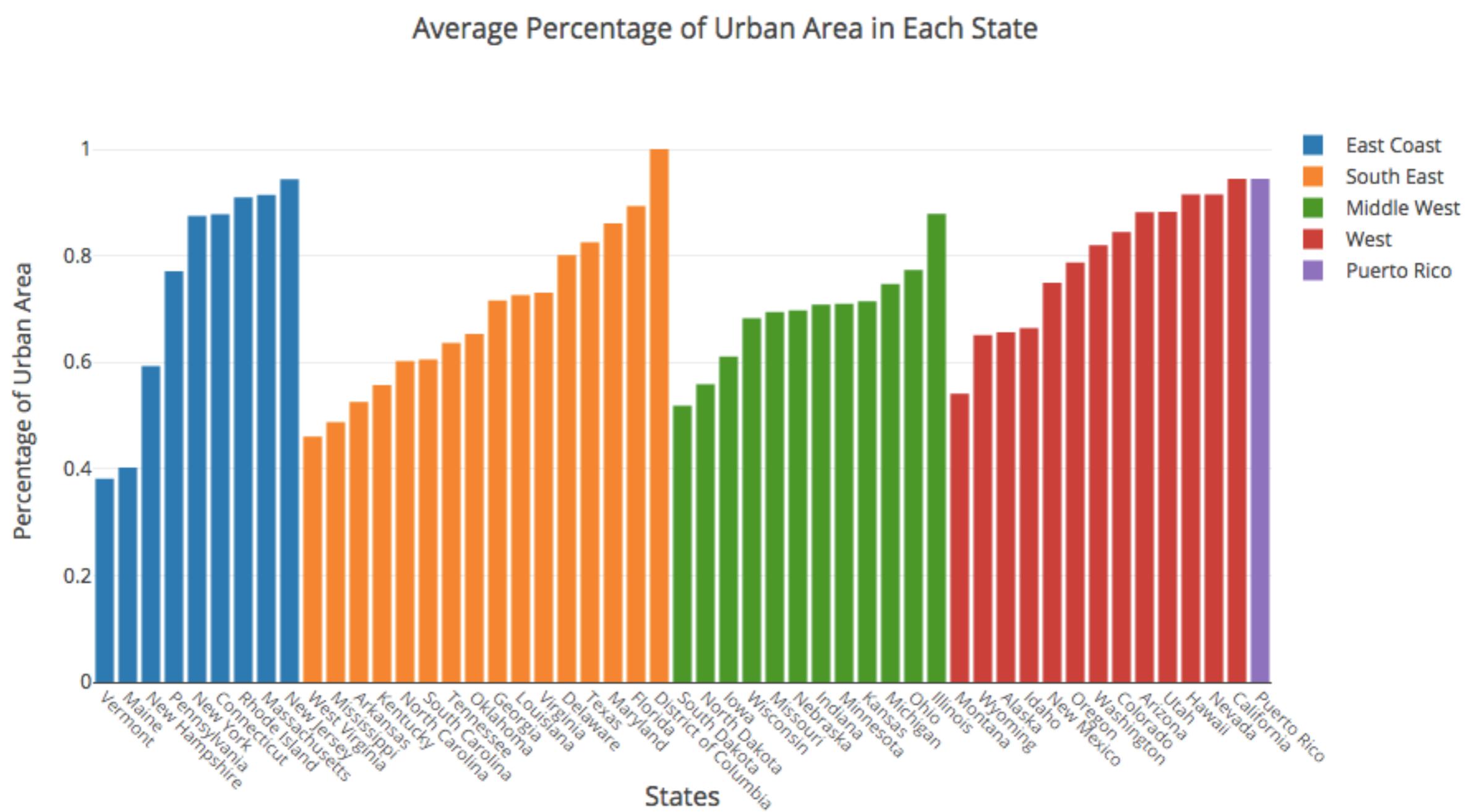


Population Dispersion

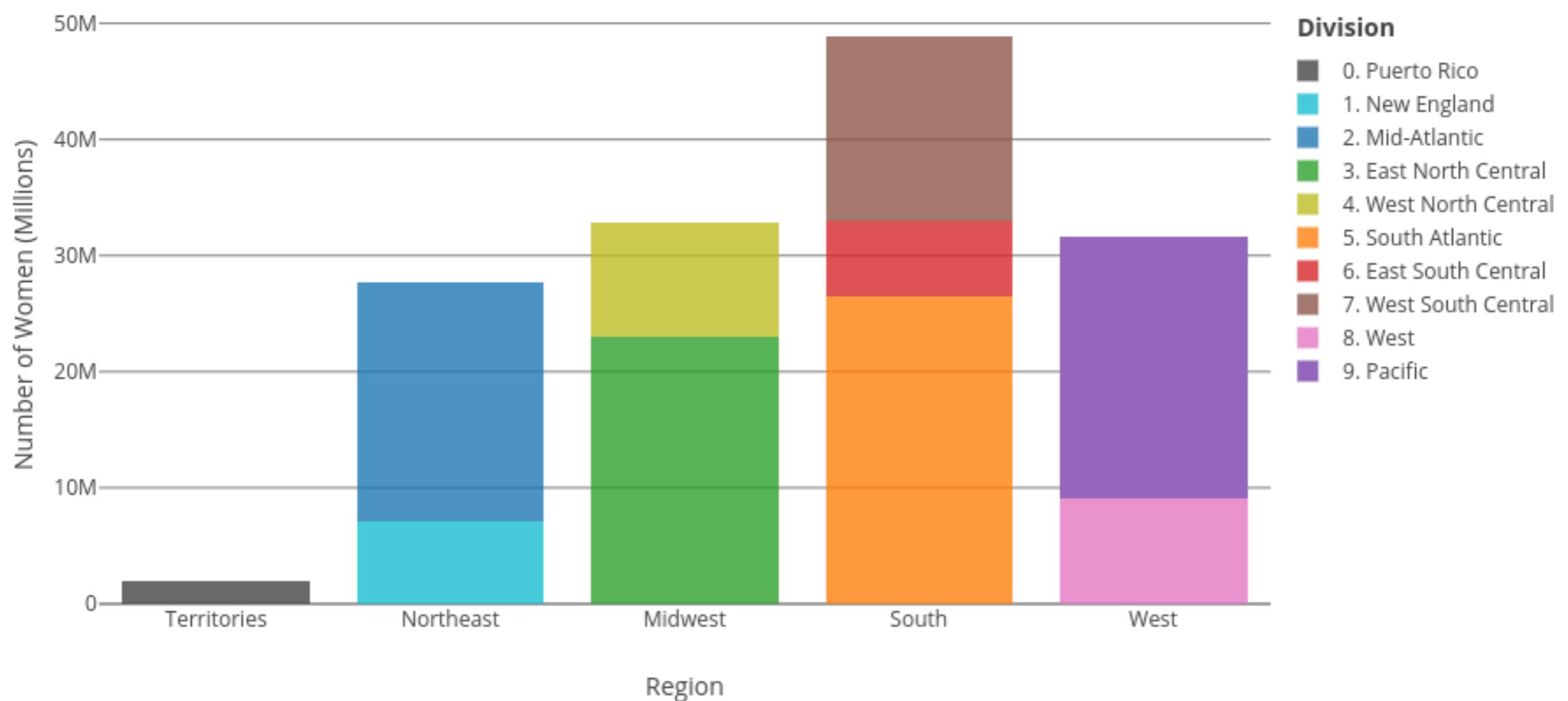


Area of water in each state

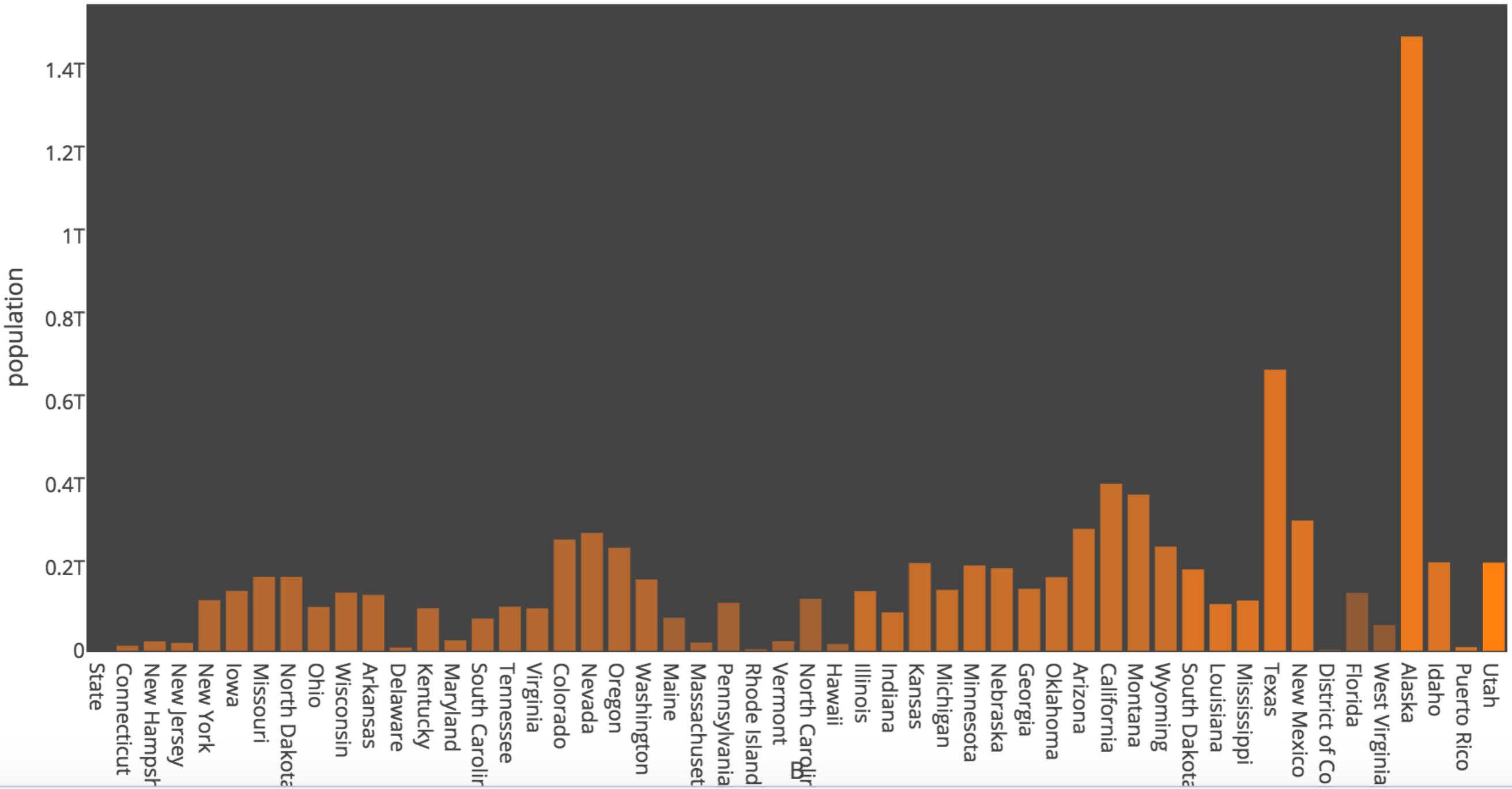




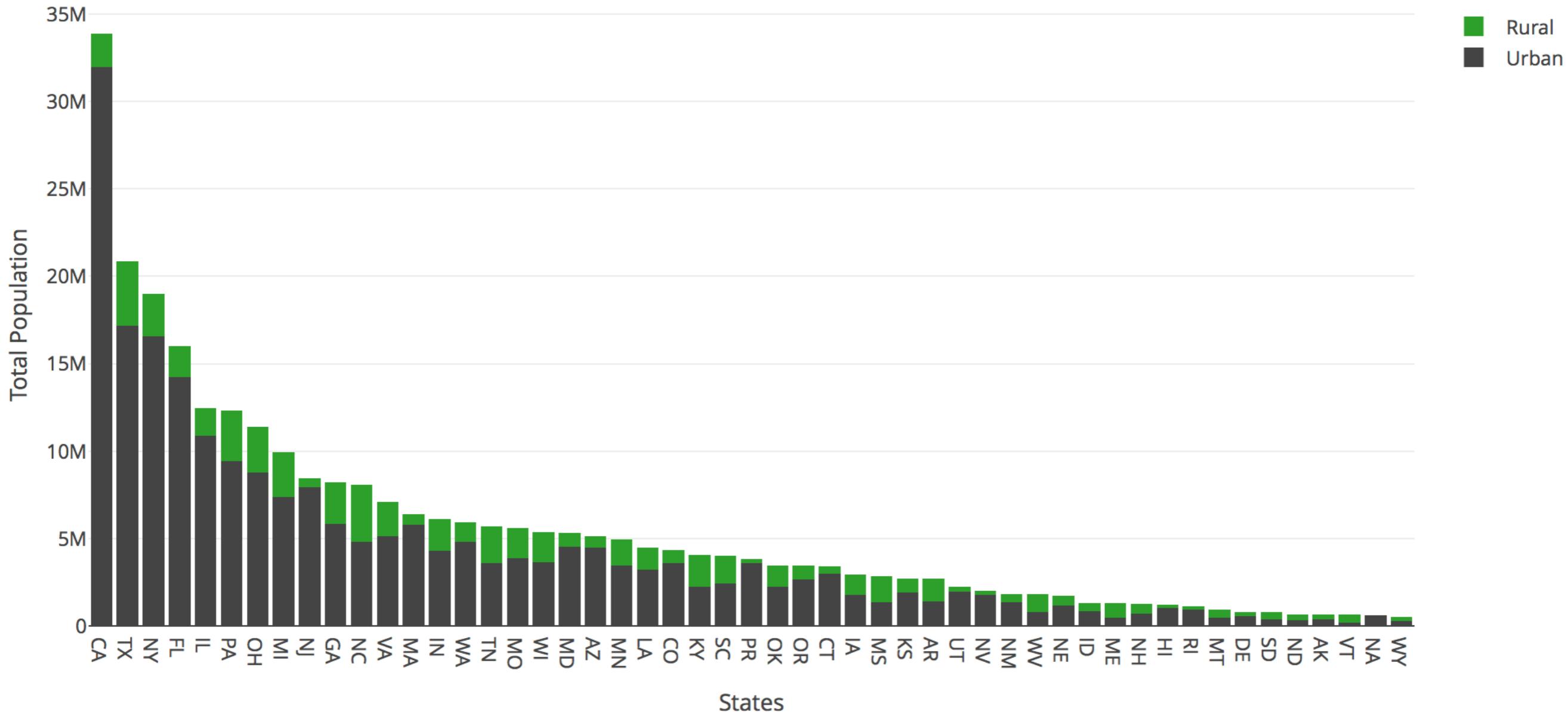
Women in the Regions of the United States



Population VS. State

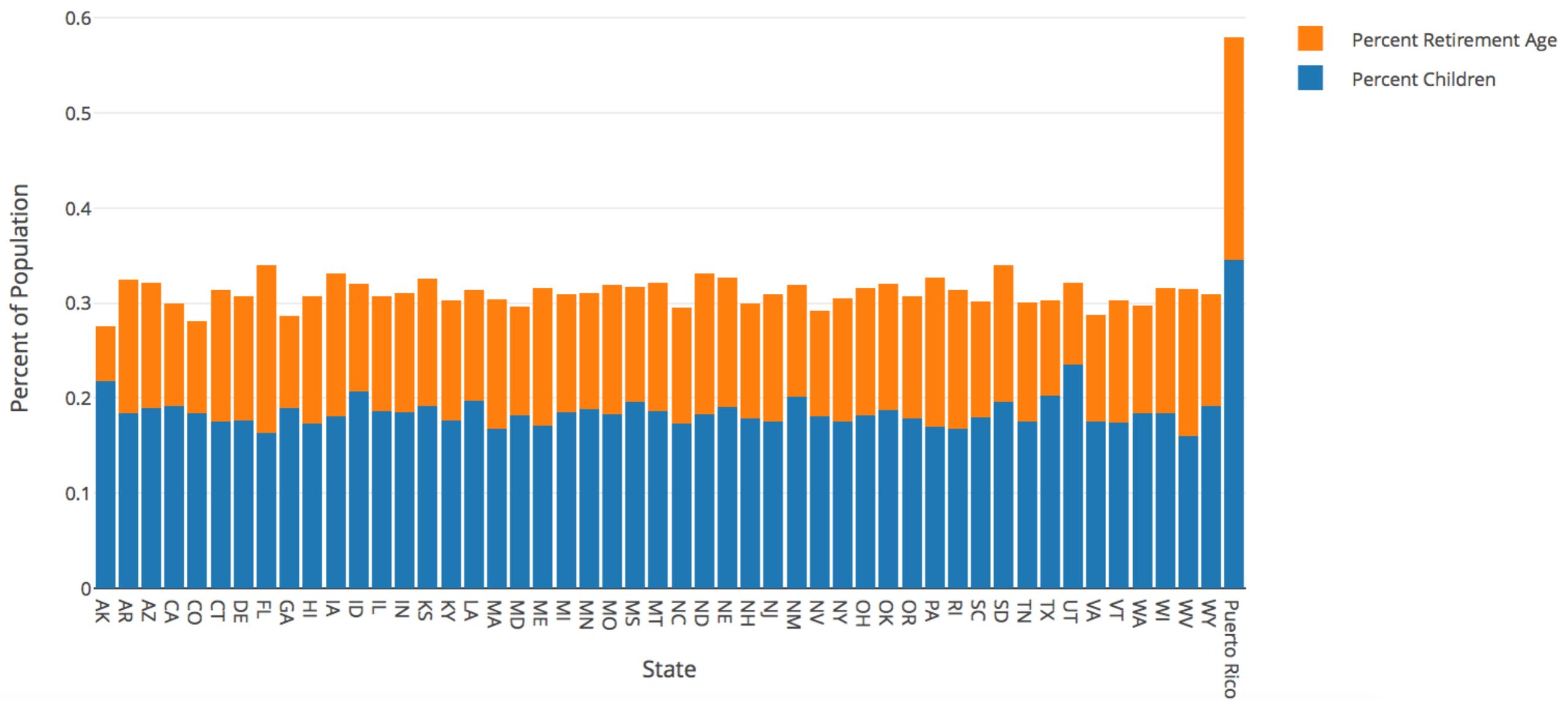


Urban and Rural Population by State





Comparison of Percent Children and Percent Retirement Age per State



Today's data is from [Open Food Facts](#). The dataset is **HUGE** so I have already filtered it a little for you—I'm giving you data just for the US, with data from the USDA, carbohydrates per 100 grams less than 100, and energy per 100 grams less than 900.

Food data star document

File Edit View Insert Format Data Tools Add-ons Help All changes saved in Drive

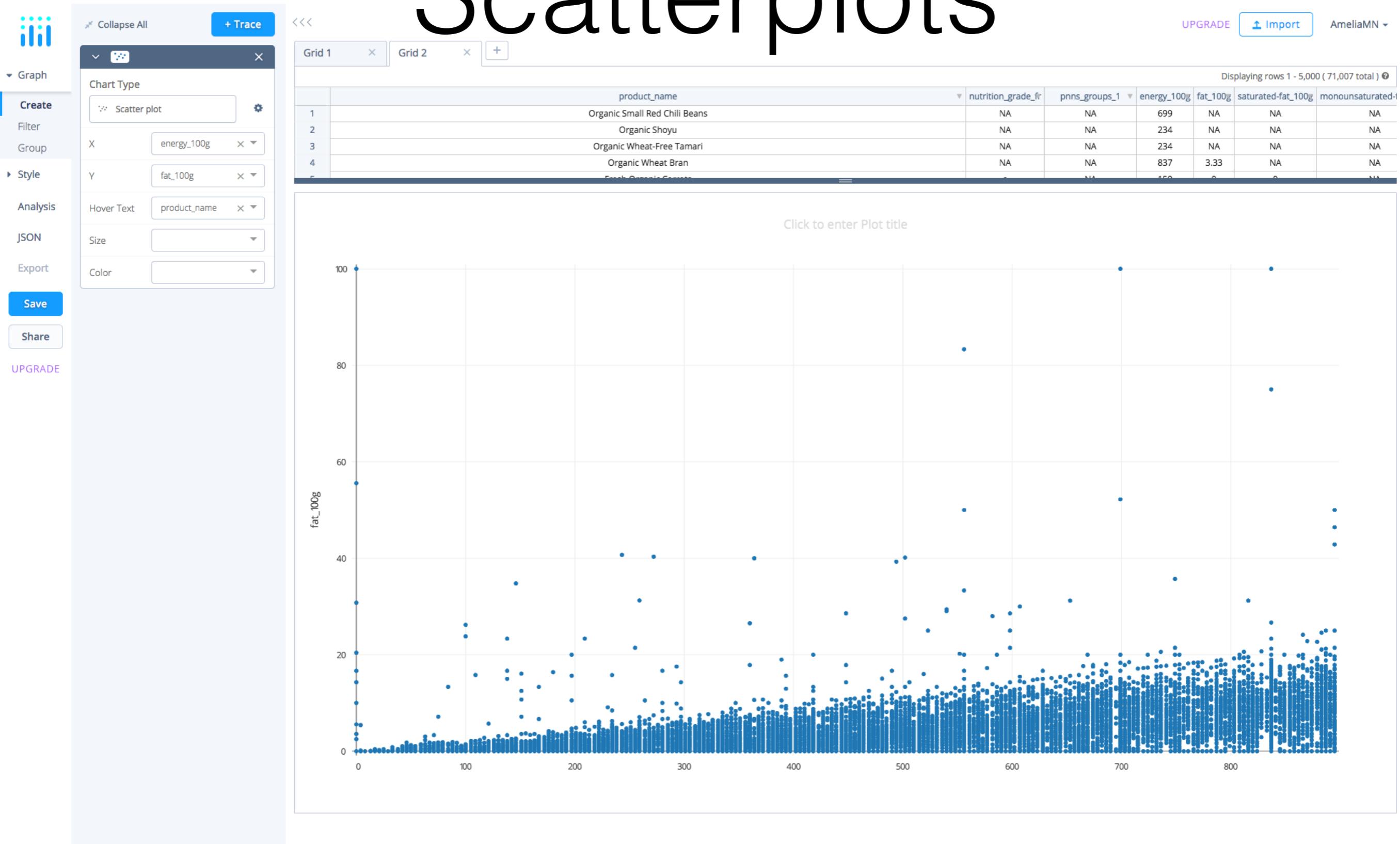
Comments Share

product_name

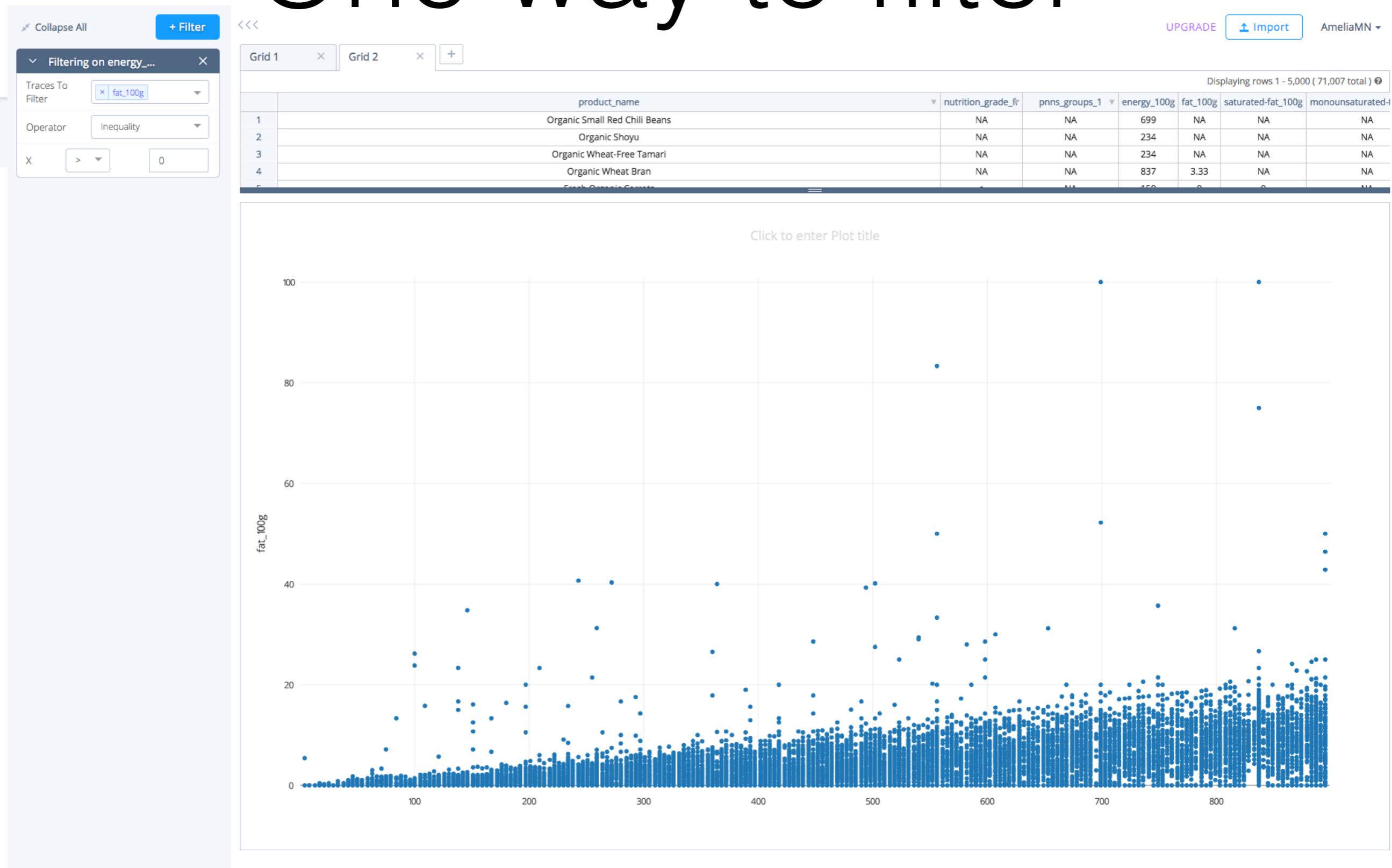
1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	cat
1	product_name	nutrition_grade_f	pnns_groups_1	energy_100g	fat_100g	saturated-fat_10g	monounsaturated	polyunsaturated-	trans-fat_100g	carbohydrates_1	sugars_100g	fiber_100g	proteins_100g	sodium_100g	vitamin-c_100g	calcium_100g	iron_100g	cat
2	Organic Small Red Chili Beans	NA	NA	699	NA	NA	NA	NA	NA	63.89	2.78	44.4	22.22	0.069	0.01	NA	0.0075	NA
3	Organic Shoyu	NA	NA	234	NA	NA	NA	NA	NA	5.56	NA	NA	11.11	5.333	NA	NA	0.003	NA
4	Organic Wheat-Free Tamari	NA	NA	234	NA	NA	NA	NA	NA	5.56	NA	NA	11.11	5.222	NA	NA	0.004	NA
5	Organic Wheat Bran	NA	NA	837	3.33	NA	NA	NA	NA	66.67	NA	40	13.33	NA	NA	0.133	0.0096	NA
6	Fresh Organic Carrots	a	NA	159	0	0	NA	NA	0	8.97	6.41	2.6	1.28	0.077	0.0077	0.026	0.00046	NA
7	Naturally Flavored Beverage Enhancer With Other Natural Flavors	NA	NA	0	0	NA	NA	NA	NA	0	0	NA	0	0.938	NA	NA	NA	NA
8	Chamomile Herbal Tea	NA	NA	0	0	NA	NA	NA	NA	70	NA	NA	0	0.3	NA	NA	NA	NA
9	Herbal Tea, Peppermint	NA	NA	0	0	NA	NA	NA	NA	1.47	NA	NA	0	0.004	NA	NA	NA	NA
10	Linden Flowers Tea	NA	NA	0	0	NA	NA	NA	NA	53.33	NA	NA	0	0	NA	NA	NA	NA
11	Apple & Cinnamon Tea	NA	NA	0	0	NA	NA	NA	NA	60	NA	NA	66.67	0.133	NA	NA	NA	NA
12	Green Tea	NA	NA	0	0	NA	NA	NA	NA	2.67	NA	NA	0	0	NA	NA	NA	NA
13	Shave Grass Herbal Tea	NA	NA	0	0	NA	NA	NA	NA	3.33	NA	NA	0	0	NA	NA	NA	NA
14	Herbal Tea, Chamomile * Mint	NA	NA	0	0	NA	NA	NA	NA	3.33	NA	NA	0	0	NA	NA	NA	NA
15	Artichoke Herbal Tea	NA	NA	0	0	NA	NA	NA	NA	3.33	NA	NA	0	0	NA	NA	NA	NA
16	Dieter's Herbal Tea	NA	NA	0	0	NA	NA	NA	NA	0	NA	NA	0	0	NA	NA	NA	NA
17	Kidneytea, Herbal Tea	NA	NA	0	0	NA	NA	NA	NA	3.33	NA	NA	0	0	NA	NA	NA	NA
18	Black Tea	NA	NA	4	0	NA	NA	NA	NA	0.3	NA	NA	0	NA	NA	NA	NA	NA
19	Sweet 'N' Hot Salad Peppers	NA	NA	598	0	NA	NA	NA	NA	32.14	25	NA	0	0.643	0.0129	NA	NA	NA
20	Between!, Dental Gum, Natural Cool Mint	NA	NA	837	0	NA	NA	NA	NA	80	NA	NA	0	0.6	0.6	NA	NA	NA
21	Eco-Dent, Between!, Sugar Free Dental Gum, Natural	NA	NA	837	0	NA	NA	NA	NA	80	NA	NA	0	0.6	0.6	NA	NA	NA
22	Ice Cream, Vanilla	d	NA	883	11.27	7.04	NA	NA	0	22.54	16.9	0	2.82	0.056	0	0.113	0	NA
23	Cornichons	NA	NA	75	0	NA	NA	NA	NA	3.57	NA	NA	0	1.214	NA	NA	NA	NA
24	Too Tarts, Smartchoice, Sugar Free Spray Can	NA	NA	205	0	NA	NA	NA	NA	22.22	0	NA	0	0	1.3333	0	0	NA
25	Sour & Fruity Candy	NA	NA	745	0	NA	NA	NA	NA	44.44	0	NA	0	0	0.6667	0	0	NA
26	Romaine Hearts	a	NA	75	0	0	NA	NA	0	3.53	1.18	2.4	1.18	0.006	0.0247	0.024	0.00085	NA
27	Romaine	a	NA	75	0	0	NA	NA	0	3.53	1.18	2.4	1.18	0.006	0.0247	0.024	0.00085	NA
28	Green Leaf Lettuce	a	NA	75	0	0	NA	NA	0	2.35	1.18	1.2	1.18	0.041	0.0042	0.024	0.00085	NA
29	Fresh Spinach	a	NA	100	0	0	NA	NA	NA	3.53	0	2.4	2.35	0.076	0.0282	0.094	0.00318	NA
30	Cooking Spinach	a	NA	100	0	0	NA	NA	0	3.53	0	2.4	2.35	0.076	0.0056	0.471	0.00318	NA

I'd like you to explore this
data using scatterplots
and heat maps in Plotly

Scatterplots



One way to filter



Another way

Food data

File Edit View Insert Format Data Tools Add-ons Help All changes saved in Drive amcnamara@smith.edu ▾ Comments Share

Sort sheet by column D, A → Z Sort sheet by column D, Z → A

Sort range... Randomize range Named ranges... Protected sheets and ranges... Split text to columns... Filter Filter views... Pivot table... Data validation...

A

	D	E	F	G	H	I	J	K	L	M	N	O	P	Q				
1	product_name	energy_100g	fat_100g	saturated-fat_10g	monounsaturated_10g	polyunsaturated_10g	trans-fat_100g	carbohydrates_100g	sugars_100g	fiber_100g	proteins_100g	sodium_100g	vitamin-c_100g	calcium_100g	iron_100g	caffeine_100g		
2	Organic Small Red Chili Beans	699	NA	NA	NA	NA	NA	63.89	2.78	44.4	22.22	0.069	0.01	NA	0.0075	NA		
3	Organic Shoyu	234	NA	NA	NA	NA	NA	5.56	NA	NA	11.11	5.333	NA	NA	0.003	NA		
4	Organic Wheat-Free Tamari	234	NA	NA	NA	NA	NA	5.56	NA	NA	11.11	5.222	NA	NA	0.004	NA		
5	Organic Wheat Bran	837	3.33	NA	NA	NA	NA	66.67	NA	40	13.33	NA	NA	0.133	0.0096	NA		
6	Fresh Organic Carrots	159	0	0	NA	NA	0	8.97	6.41	2.6	1.28	0.077	0.0077	0.026	0.00046	NA		
7	Naturally Flavored Beverage Enhancer	0	0	NA	NA	NA	NA	0	0	NA	0	0.938	NA	NA	NA	NA		
8	Chamomile Herbal Tea	0	0	NA	NA	NA	NA	70	NA	NA	0	0.3	NA	NA	NA	NA		
9	Herbal Tea, Peppermint	0	0	NA	NA	NA	NA	1.47	NA	NA	0	0.004	NA	NA	NA	NA		
10	Linden Flowers Tea	0	0	NA	NA	NA	NA	53.33	NA	NA	0	0	NA	NA	NA	NA		
11	Apple & Cinnamon Tea	0	0	NA	NA	NA	NA	60	NA	NA	66.67	0.133	NA	NA	NA	NA		
12	Green Tea	0	0	NA	NA	NA	NA	2.67	NA	NA	0	0	NA	NA	NA	NA		
13	Shave Grass Herbal Tea	NA	NA	0	0	NA	NA	3.33	NA	NA	0	0	NA	NA	NA	NA		
14	Herbal Tea, Chamomile * Mint	NA	NA	0	0	NA	NA	3.33	NA	NA	0	0	NA	NA	NA	NA		
15	Artichoke Herbal Tea	NA	NA	0	0	NA	NA	3.33	NA	NA	0	0	NA	NA	NA	NA		
16	Dieter's Herbal Tea	NA	NA	0	0	NA	NA	0	NA	NA	0	0	NA	NA	NA	NA		
17	Kidneytea, Herbal Tea	NA	NA	0	0	NA	NA	3.33	NA	NA	0	0	NA	NA	NA	NA		
18	Black Tea	NA	NA	4	0	NA	NA	0.3	NA	NA	0	NA	NA	NA	NA	NA		
19	Sweet 'N' Hot Salad Peppers	NA	NA	598	0	NA	NA	NA	32.14	25	NA	0	0.643	0.0129	NA	NA		
20	Between!, Dental Gum, Natural Cool Mint	NA	NA	837	0	NA	NA	NA	80	NA	NA	0	0.6	0.6	NA	NA		
21	Eco-Dent, Between!, Sugar Free Dental Gum, C	NA	NA	837	0	NA	NA	NA	80	NA	NA	0	0.6	0.6	NA	NA		
22	Ice Cream, Vanilla	d	NA	883	11.27	7.04	NA	NA	0	22.54	16.9	0	2.82	0.056	0	0.113	0	
23	Cornichons	NA	NA	75	0	NA	NA	NA	3.57	NA	NA	0	1.214	NA	NA	NA	NA	
24	Too Tarts, Smartchoice, Sugar Free Spray Can	NA	NA	205	0	NA	NA	NA	22.22	0	NA	0	0	1.3333	0	0	0	
25	Sour & Fruity Candy	NA	NA	745	0	NA	NA	NA	44.44	0	NA	0	0	0.6667	0	0	0	
26	Romaine Hearts	a	NA	75	0	0	NA	NA	0	3.53	1.18	2.4	1.18	0.006	0.0247	0.024	0.00085	NA
27	Romaine	a	NA	75	0	0	NA	NA	0	3.53	1.18	2.4	1.18	0.006	0.0247	0.024	0.00085	NA
28	Green Leaf Lettuce	a	NA	75	0	0	NA	NA	0	2.35	1.18	1.2	1.18	0.041	0.0042	0.024	0.00085	NA
29	Fresh Spinach	a	NA	100	0	0	NA	NA	3.53	0	2.4	2.35	0.076	0.0282	0.094	0.00318	NA	
30	Cooking Spinach	a	NA	100	0	0	NA	NA	0	3.53	0	2.4	2.35	0.076	0.0056	0.471	0.00318	NA
31	Quick Cook Sprout Halves	a	NA	176	0	0	NA	NA	9.52	2.38	3.6	3.57	0.024	0.0857	0.048	0.00129	NA	
32	Celery	a	NA	59	0	0	NA	NA	0	3.64	1.82	1.8	0	0.105	0.0082	0.036	0.00033	NA
33	Season & Steam Kalettes (Kale Sprouts)	a	NA	222	0	0	NA	NA	7.06	1.18	2.4	4.71	0.082	0.0247	0.094	0.00127	NA	
34	Ryan's, Juice Melange, Fuji Pom Blend	b	NA	192	0	0	NA	NA	0	11.67	10.42	0	0	0.015	0	0	0.00015	NA
35	Ryan's, Lemonade	b	NA	226	0	0	NA	NA	0	13.33	13.33	0	0	0.004	5.00E-04	0	0	0
36	Ryan's, Spiced Apple Cider	b	NA	192	0	0	NA	NA	0	11.25	10	0.4	0	0.01	0	0.008	0.00015	NA
37	Ryan's, Pink Lady, Apple Cider	b	NA	192	0	0	NA	NA	0	11.67	8.33	0	0.42	0.006	0.001	0	0	0
38	Ryan's, Organic Juice, Apple	b	NA	192	0	0	NA	NA	0	11.67	10.42	0	0	0.017	0.0038	0	0	0
39	Ryan's, Opal Blend Melange, Apple Cider	b	NA	192	0	0	NA	NA	0	11.67	8.33	0	0.42	0.006	0.001	0	0	0
40	Raw Shrimp	b	NA	247	0	0	NA	NA	0	0	0	0	0	14.12	0.553	0.0014	0	0
41	Guiltless Gourmet, Organic Unsweetened Cocco	a	NA	71	0	0	NA	NA	0	4	3	1	0.4	0.011	0.001	0.008	0.00014	NA
42	Caperberries In Vinegar	NA	NA	75	0	NA	NA	NA	3.57	NA	NA	0	1.464	NA	NA	NA	NA	NA
43	Diced In Tomato Juice	b	NA	79	0	0	NA	NA	0	4.62	3.08	0.8	0.77	0.223	0.0162	0.015	0.00055	NA
44	Vindaloo Sauce	c	NA	427	6.78	0.42	NA	NA	0	9.32	4.24	1.7	1.69	0.593	0.0051	0.017	0.00092	NA
45	Tofu Firm	a	NA	372	3.8	0	1.27	2.53	0	2.53	0	1.3	8.86	0	0	0.127	0.00137	NA
46	Traders Joe's, Baking Powder	NA	NA	0	0	NA	NA	NA	0	NA	NA	0	9.167	NA	6.667	NA	NA	NA
47	Salsa Autentica	NA	NA	138	0	NA	NA	NA	6.67	3.33	NA	0	0.867	NA	NA	NA	NA	NA
48	First Crush, Unsweetened Gravenstein Apple Sa	a	NA	172	0	0	NA	NA	0	10.66	8.2	1.6	0	0.004	0.001	0	3.00E-04	NA
49	Whole Kernel Corn	b	NA	201	1.2	0	NA	NA	0	7.2	5.6	1.6	0.16	0.0029	0	0.00029	NA	NA

Another way

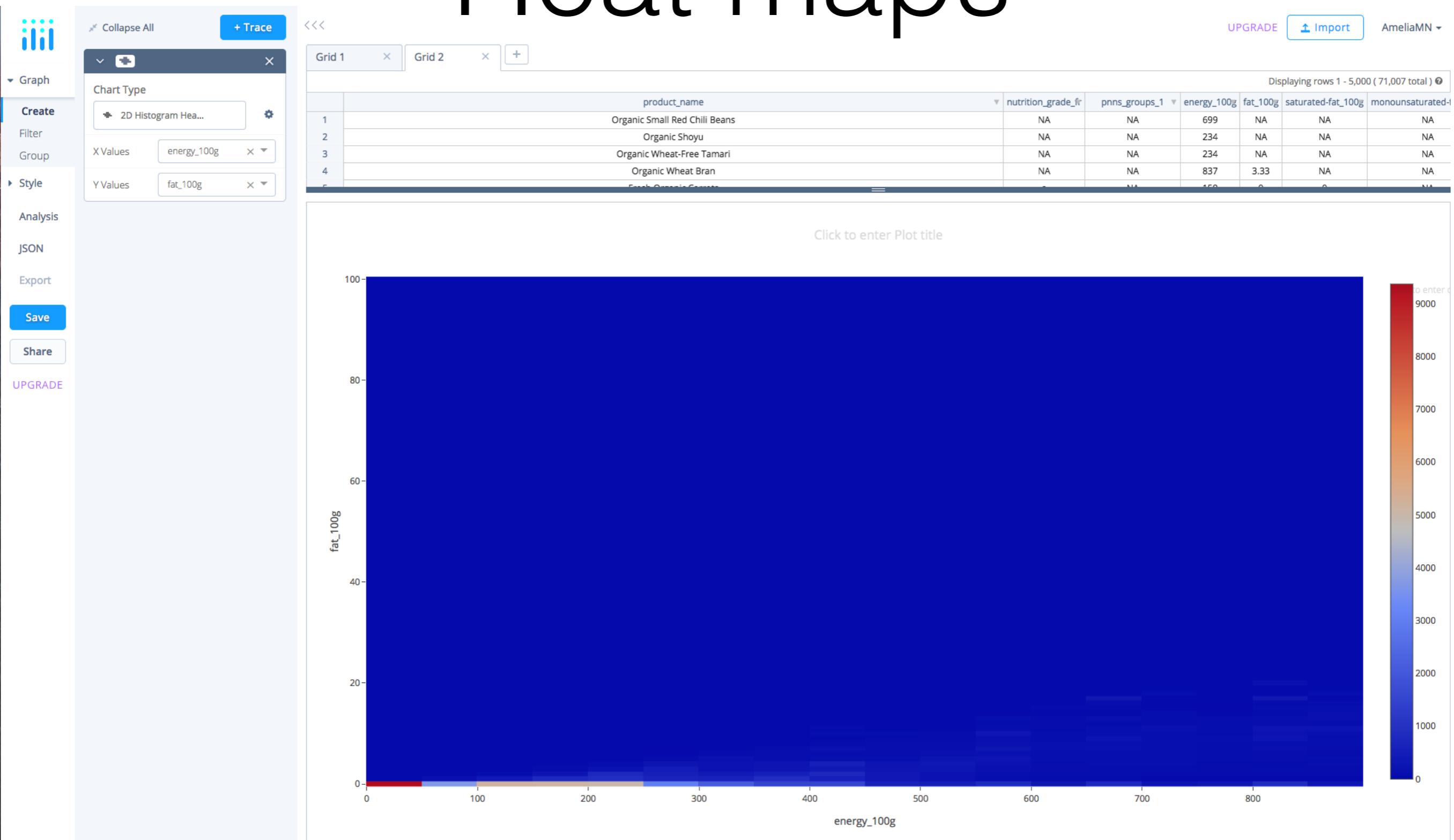
Food data

File Edit View Insert Format Data Tools Add-ons Help All changes saved in Drive amcnamara@smith.edu ▾ Comments Share

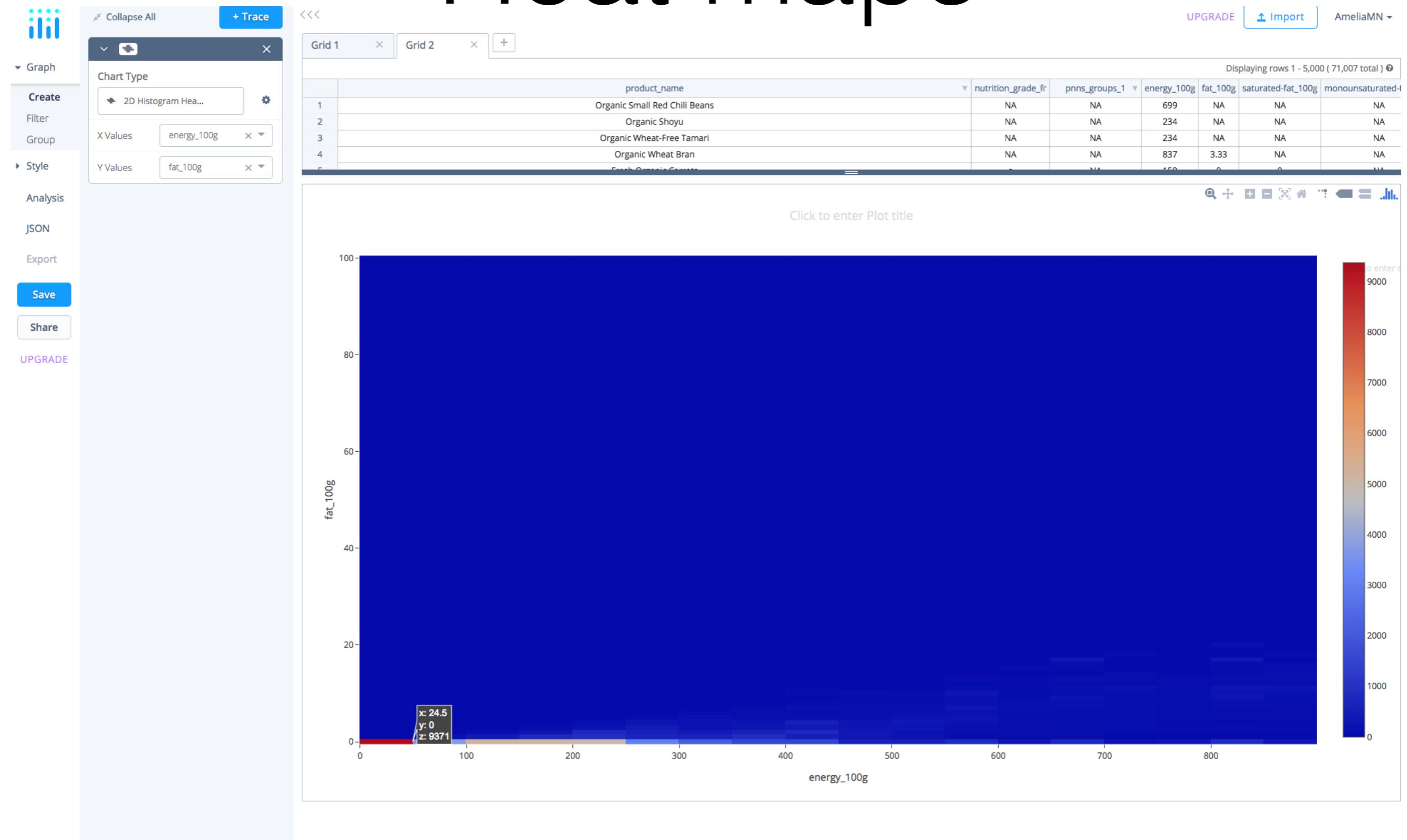
fx energy_100g

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	
1	product_name	nutrition_gr	pnns_group	energy_100g	fat_100g	saturated-fat	monounsatu	polyunsatur	trans-fat_100g	carbohydrat	sugars_100g	fiber_100g	proteins_100g	sodium_100g	vitamin-c_100g	calcium_100g	iron_100g	caff
2	Organic Small Red Chili Beans	NA	Sort A → Z	NA	NA	NA	NA	NA	NA	63.89	2.78	44.4	22.22	0.069	0.01	NA	0.0075	NA
3	Organic Shoyu	NA	Sort Z → A	NA	NA	NA	NA	NA	NA	5.56	NA	NA	11.11	5.333	NA	NA	0.003	NA
4	Organic Wheat-Free Tamari	NA		NA	NA	NA	NA	NA	NA	5.56	NA	NA	11.11	5.222	NA	NA	0.004	NA
5	Organic Wheat Bran	NA		3.33	NA	NA	NA	NA	NA	66.67	NA	40	13.33	NA	NA	0.133	0.0096	NA
6	Fresh Organic Carrots	a		0	0	NA	NA	NA	0	8.97	6.41	2.6	1.28	0.077	0.0077	0.026	0.00046	NA
7	Naturally Flavored Beverage Enhancer With Ot	NA	Filter by condition...	None	0	NA	NA	NA	NA	0	0	NA	0	0.938	NA	NA	NA	NA
8	Chamomile Herbal Tea	NA		Cell is empty	0	NA	NA	NA	NA	70	NA	NA	0	0.3	NA	NA	NA	NA
9	Herbal Tea, Peppermint	NA		Cell is not empty	0	NA	NA	NA	NA	1.47	NA	NA	0	0.004	NA	NA	NA	NA
10	Linden Flowers Tea	NA		Text contains	0	NA	NA	NA	NA	53.33	NA	NA	0	0	NA	NA	NA	NA
11	Apple & Cinnamon Tea	NA		Text does not contain	0	NA	NA	NA	NA	2.67	NA	NA	0	0	NA	NA	NA	NA
12	Green Tea	NA		Text starts with	0	NA	NA	NA	NA	3.33	NA	NA	0	0	NA	NA	NA	NA
13	Shave Grass Herbal Tea	NA		Text ends with	0	NA	NA	NA	NA	3.33	NA	NA	0	0	NA	NA	NA	NA
14	Herbal Tea, Chamomile * Mint	NA		Text is exactly	0	NA	NA	NA	NA	3.33	NA	NA	0	0	NA	NA	NA	NA
15	Artichoke Herbal Tea	NA		Date is	0	NA	NA	NA	NA	32.14	25	NA	0	0.643	0.0129	NA	NA	NA
16	Dieter's Herbal Tea	NA		Date is before	0	NA	NA	NA	NA	80	NA	NA	0	0.6	0.6	NA	NA	NA
17	Kidneytea, Herbal Tea	NA		Date is after	0	NA	NA	NA	NA	80	NA	NA	0	0.6	0.6	NA	NA	NA
18	Black Tea	NA		Greater than	11.27	7.04	NA	NA	0	22.54	16.9	0	2.82	0.056	0	0.113	0	NA
19	Sweet 'N' Hot Salad Peppers	NA		Greater than or equal to	0	NA	NA	NA	NA	3.57	NA	NA	0	1.214	NA	NA	NA	NA
20	Between!, Dental Gum, Natural Cool Mint	NA		Less than	0	NA	NA	NA	NA	22.22	0	NA	0	0	1.3333	0	0	NA
21	Eco-Dent, Between!, Sugar Free Dental Gum, (NA		Less than or equal to	0	NA	NA	NA	NA	44.44	0	NA	0	0	0.6667	0	0	NA
22	Ice Cream, Vanilla	d		Is equal to	0	0	NA	NA	0	3.53	1.18	2.4	1.18	0.006	0.0247	0.024	0.00085	NA
23	Cornichons	NA		Is not equal to	0	0	NA	NA	0	3.53	1.18	2.4	1.18	0.006	0.0247	0.024	0.00085	NA
24	Too Tarts, Smartchoice, Sugar Free Spray Can	NA		Is between	0	0	NA	NA	0	2.35	1.18	1.2	1.18	0.041	0.0042	0.024	0.00085	NA
25	Sour & Fruity Candy	NA		Is not between	0	0	NA	NA	0	3.53	0	2.4	2.35	0.076	0.0282	0.094	0.00318	NA
26	Romaine Hearts	a		Custom formula is	0	0	NA	NA	0	9.52	2.38	3.6	3.57	0.024	0.0857	0.048	0.00129	NA
27	Romaine	a			0	0	NA	NA	0	3.64	1.82	1.8	0	0.105	0.0082	0.036	0.00033	NA
28	Green Leaf Lettuce	a			0	0	NA	NA	0	7.06	1.18	2.4	4.71	0.082	0.0247	0.094	0.00127	NA
29	Fresh Spinach	a			0	0	NA	NA	0	11.67	10.42	0	0	0.015	0	0	0.00015	NA
30	Cooking Spinach	a			NA	220	0	0	0	13.33	13.33	0	0	0.004	5.00E-04	0	0	NA
31	Quick Cook Sprout Halves	a			NA	192	0	0	0	11.25	10	0.4	0	0.01	0	0.008	0.00015	NA
32	Celery	a			NA	192	0	0	0	11.67	8.33	0	0.42	0.006	0.001	0	0	NA
33	Season & Steam Klettes (Kale Sprouts)	a			NA	192	0	0	0	11.67	10.42	0	0	0	0	0	0	NA
34	Ryan's, Juice Melange, Fuji Pom Blend	b			NA	247	0	0	0	11.67	10.42	0	0	0	0	0	0	NA
35	Ryan's, Lemonade	b			NA	71	0	0	0	4	3	1	0.4	0.011	0.001	0.008	0.00014	NA
36	Ryan's, Spiced Apple Cider	b			NA	75	0	0	0	3.57	NA	NA	0	1.464	NA	NA	NA	NA
37	Ryan's, Pink Lady, Apple Cider	b			NA	79	0	0	0	4.62	3.08	0.8	0.77	0.223	0.0162	0.015	0.00055	NA
38	Ryan's, Organic Juice, Apple	b			NA	427	6.78	0.42	NA	9.32	4.24	1.7	1.69	0.593	0.0051	0.017	0.00092	NA
39	Ryan's, Opal Blend Melange, Apple Cider	b			NA	192	0	0	0	11.67	8.33	0	0.42	0.006	0.001	0	0	NA
40	Raw Shrimp	b			NA	247	0	0	0	0	0	0	0	14.12	0.553	0.0014	0	0
41	Guiltless Gourmet, Organic Unsweetened Cocco a	a			NA	71	0	0	0	0	4	3	1	0.4	0.011	0.001	0.008	0.00014
42	Caperberries In Vinegar	NA			NA	75	0	0	0	3.57	NA	NA	0	1.464	NA	NA	NA	NA
43	Diced In Tomato Juice	b			NA	192	0	0	0	4.62	3.08	0.8	0.77	0.223	0.0162	0.015	0.00055	NA
44	Vindaloo Sauce	c			NA	427	6.78	0.42	NA	0	0	0	0	9.167	NA	6.667	NA	NA
45	Tofu Firm	a			NA	372	3.8	0	1.27	2.53	0	0	0	0	0	0	0.127	0.00137
46	Traders Joe's, Baking Powder	NA			NA	0	0	0	NA	NA	0	NA	0	0	0	0	0	
47	Salsa Autentica	NA			NA	138	0	0	NA	NA	0	0	0	0.867	NA	NA	NA	NA
48	First Crush, Unsweetened Gravenstein Apple Sa	a			NA	172	0	0	0	NA	0	0	0	0.004	0.001	0	3.00E-04	NA
49	Whole Kernel Corn	b			NA	201	1.2	0	0	NA	0	0	0	0.16	0.0029	0	0.00029	NA

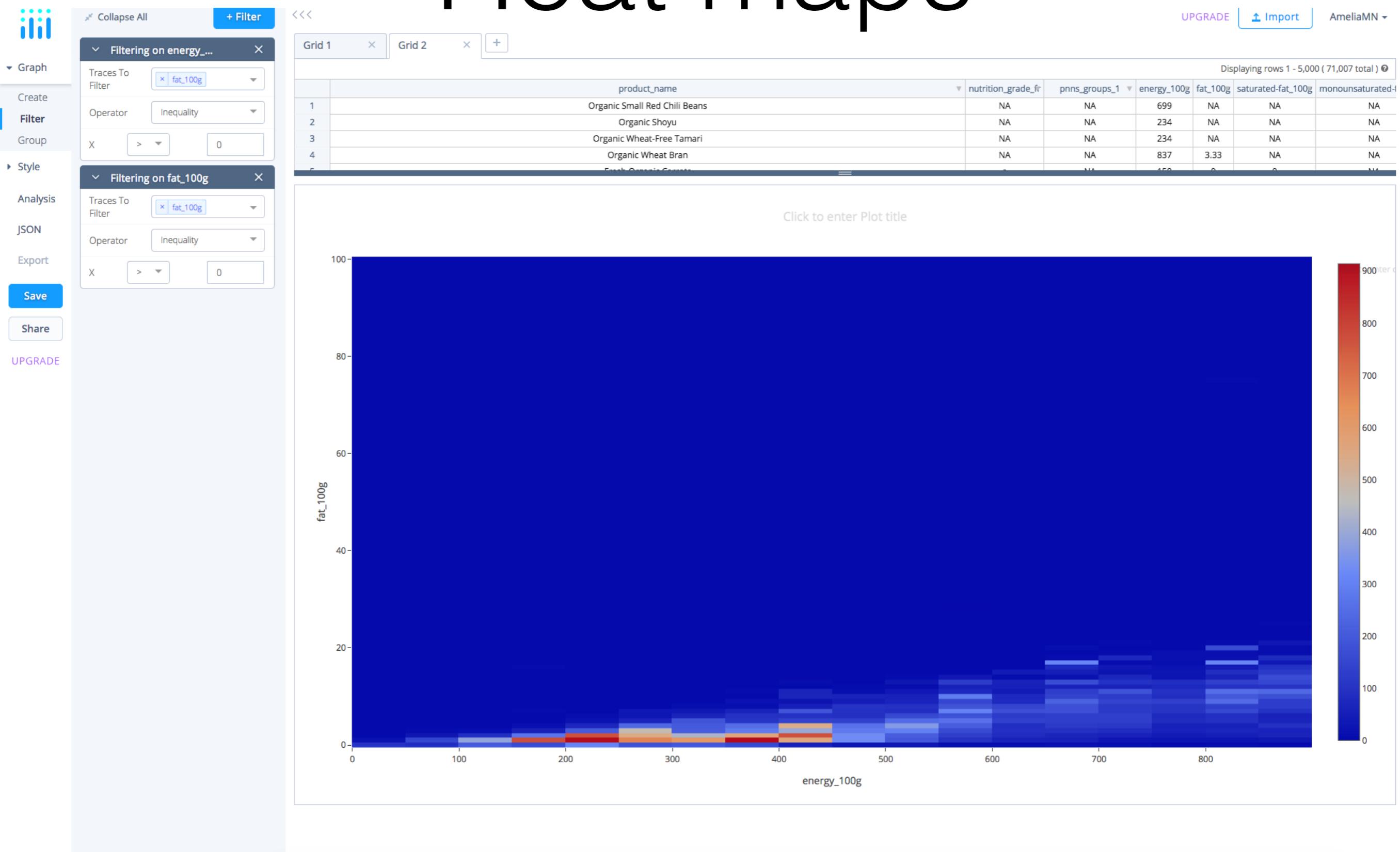
Heat maps



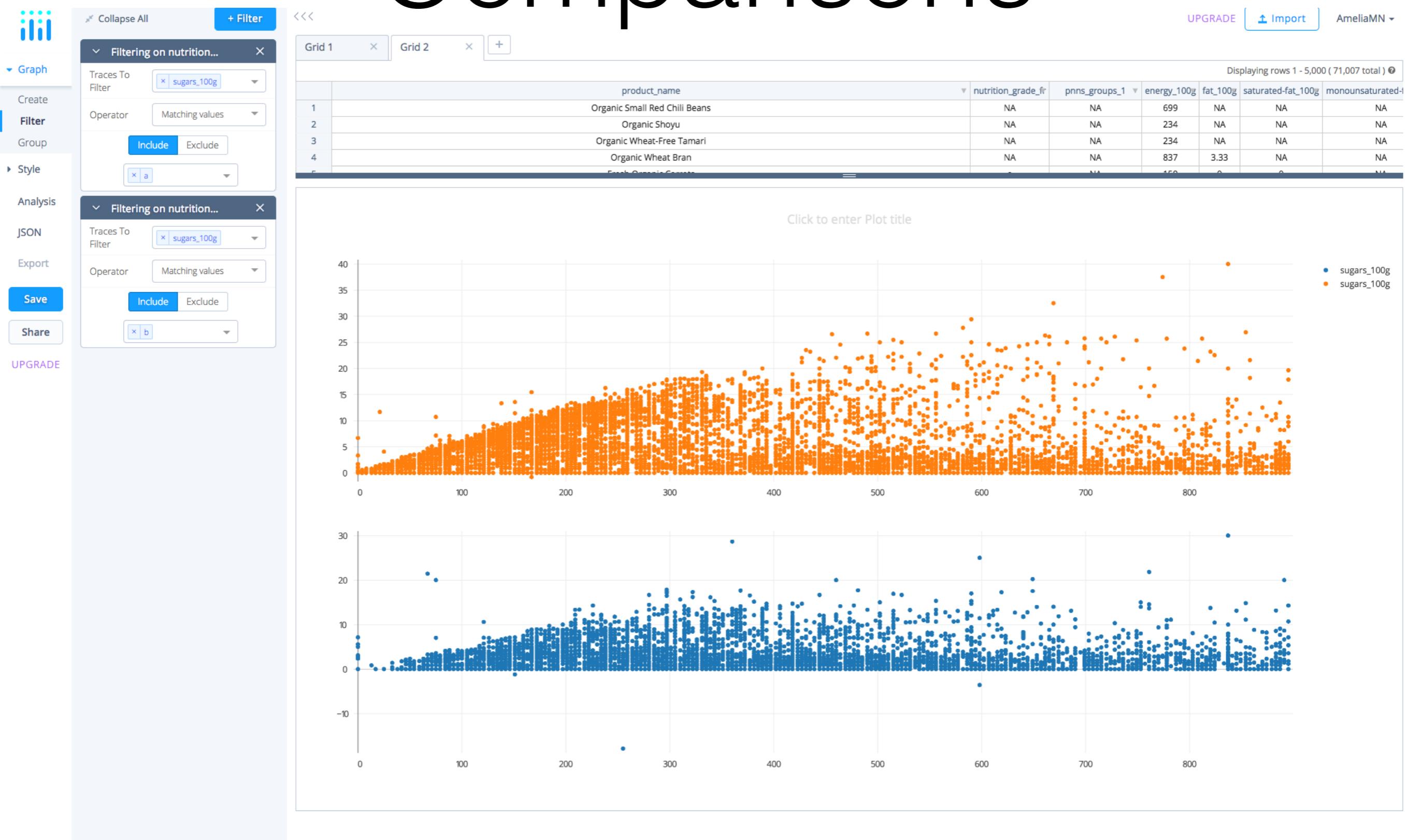
Heat maps



Heat maps



Comparisons



Lab assignment

- Create a scatterplot or a heatmap displaying some relationship in the nutrition data
- Post a screenshot in #lab3
- Comment on what your plot shows and your design decisions