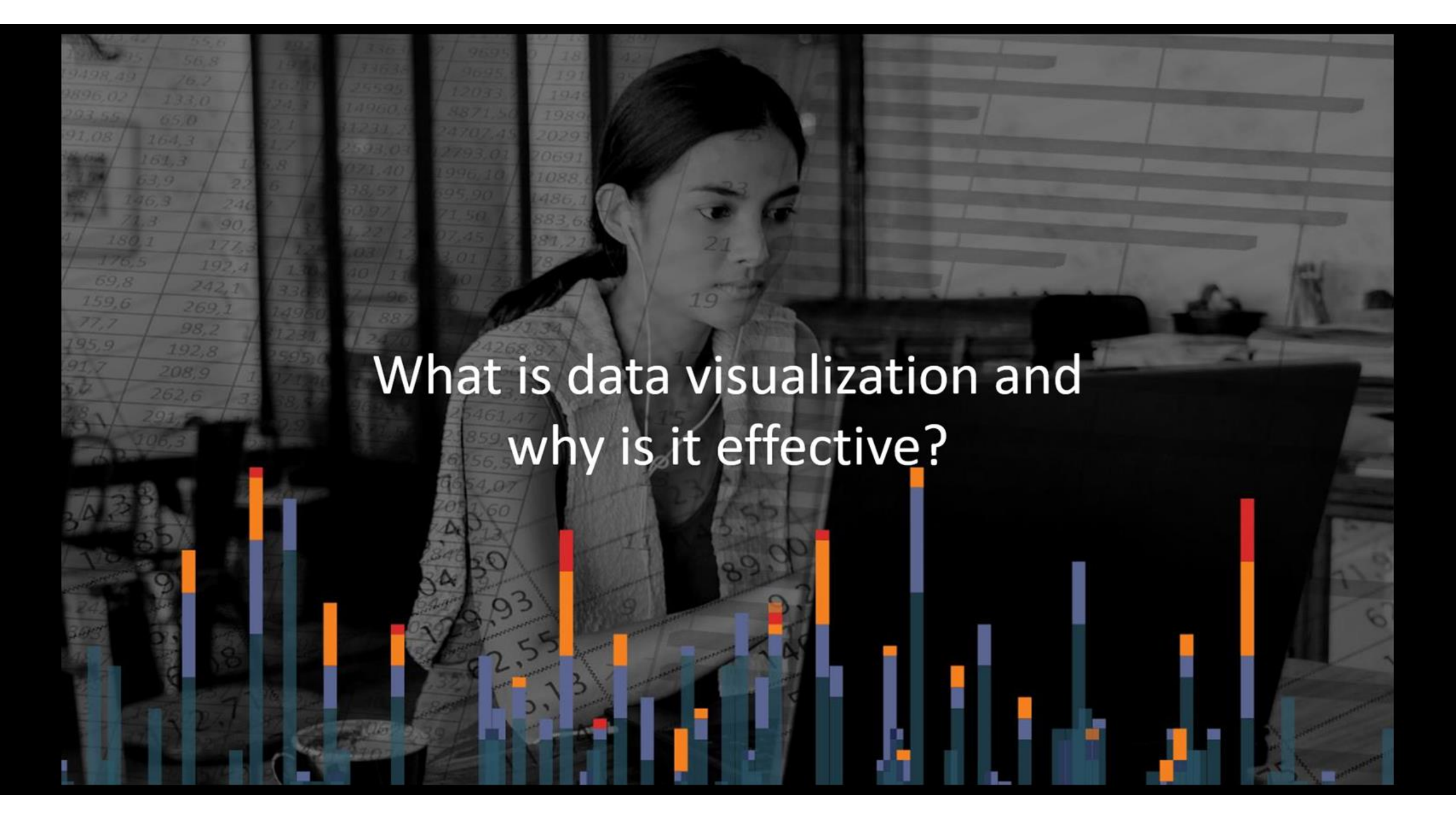# Data Visualization ≠ Visual Data Analysis

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+ableau

We help **people** see and understand data

What is data visualization and why is it effective?

SHALL WE PLAY A GAME?

Anscombe I
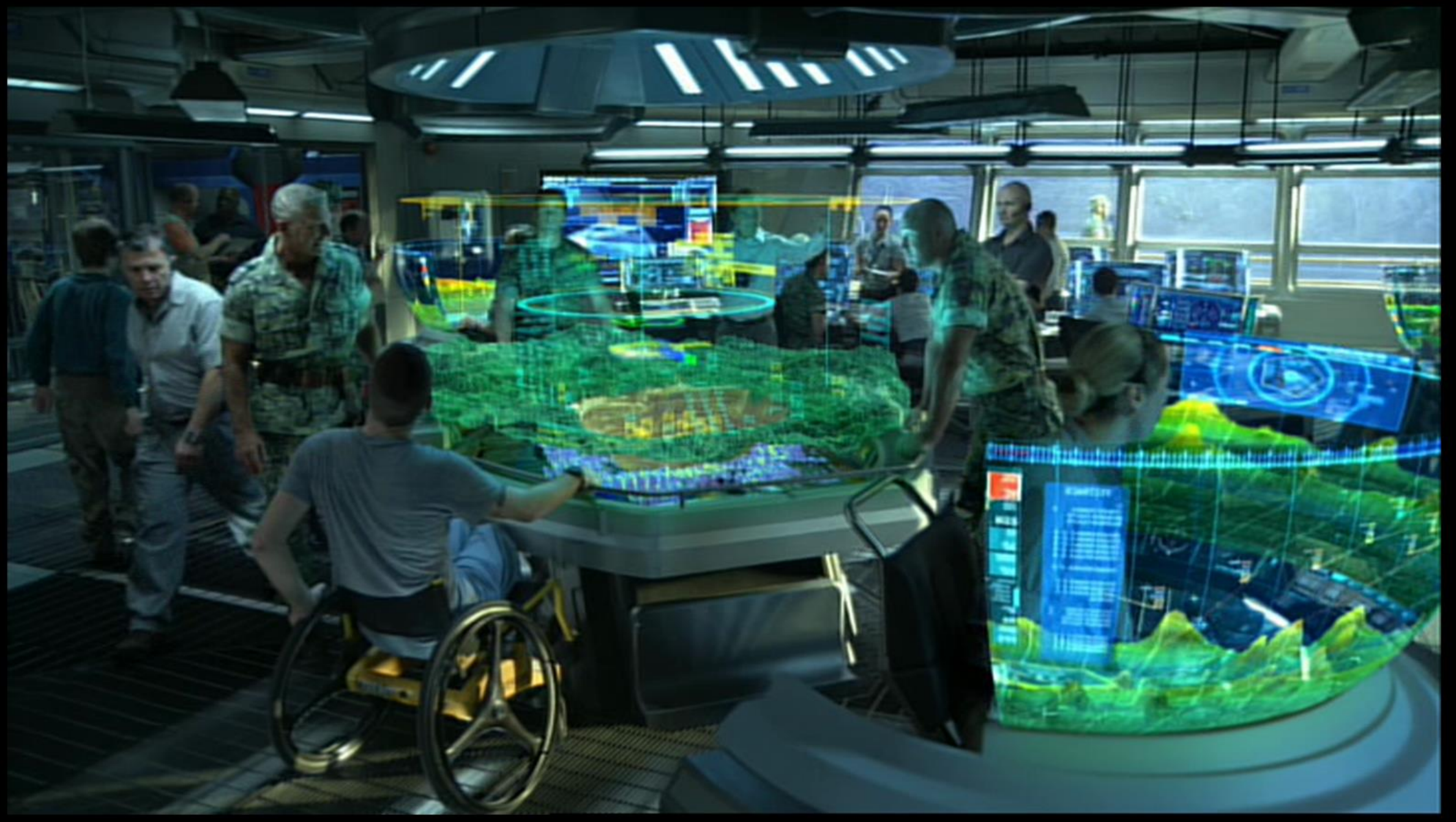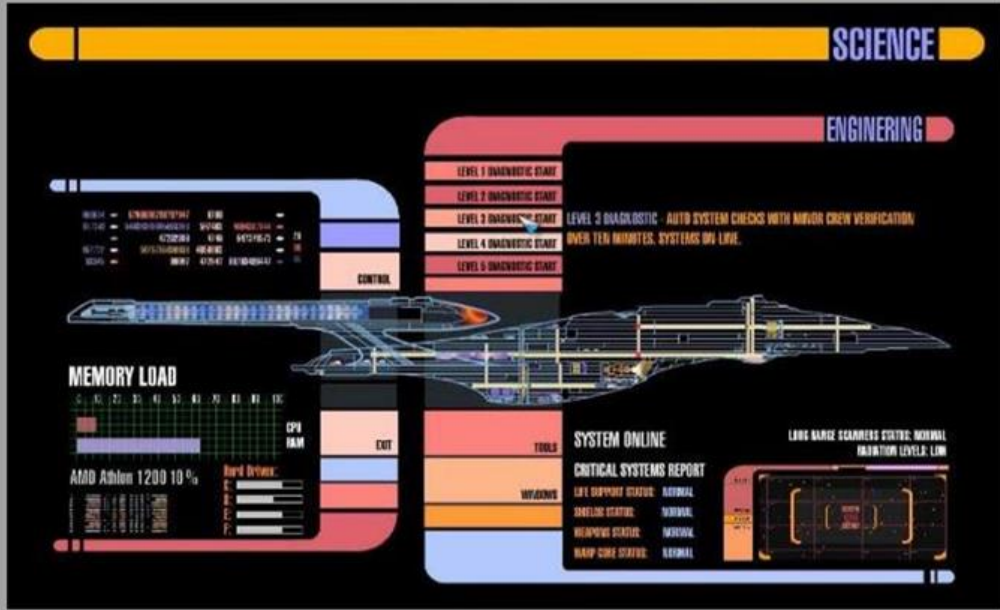
I		II		III		IV	
X	Y	X	Y	X	Y	X	Y
10.00	8.04	10.00	9.14	10.00	7.46	8.00	6.58
8.00	6.95	8.00	8.14	8.00	6.77	8.00	5.76
13.00	7.58	13.00	8.74	13.00	12.74	8.00	7.71
9.00	8.81	9.00	8.77	9.00	7.11	8.00	8.84
11.00	8.33	11.00	9.26	11.00	7.81	8.00	8.47
14.00	9.96	14.00	8.10	14.00	8.84	8.00	7.04
6.00	7.24	6.00	6.13	6.00	6.08	8.00	5.25
4.00	4.26	4.00	3.10	4.00	5.39	19.00	12.50
12.00	10.84	12.00	9.13	12.00	8.15	8.00	5.56
7.00	4.82	7.00	7.26	7.00	6.42	8.00	7.91
5.00	5.68	5.00	4.74	5.00	5.73	8.00	6.89

Dataset
- I
- II
- III
- IV

X and Y broken down by Dataset vs. Id. Color shows details about Dataset.

Anscombe II

	I	II	III	IV
X	99.00	99.00	99.00	99.00
Y	82.51	82.51	82.50	82.51
Avg. X	9.00	9.00	9.00	9.00
Avg. Y	7.50	7.50	7.50	7.50
Std. dev. of X	3.32	3.32	3.32	3.32
Std. dev. of Y	2.03	2.03	2.03	2.03

Dataset
- I
- II
- III
- IV

X, Y, Avg. X, Avg. Y, Std. dev. of X and Std. dev. of Y broken down by Dataset. Color shows details about Dataset.

Anscombe III
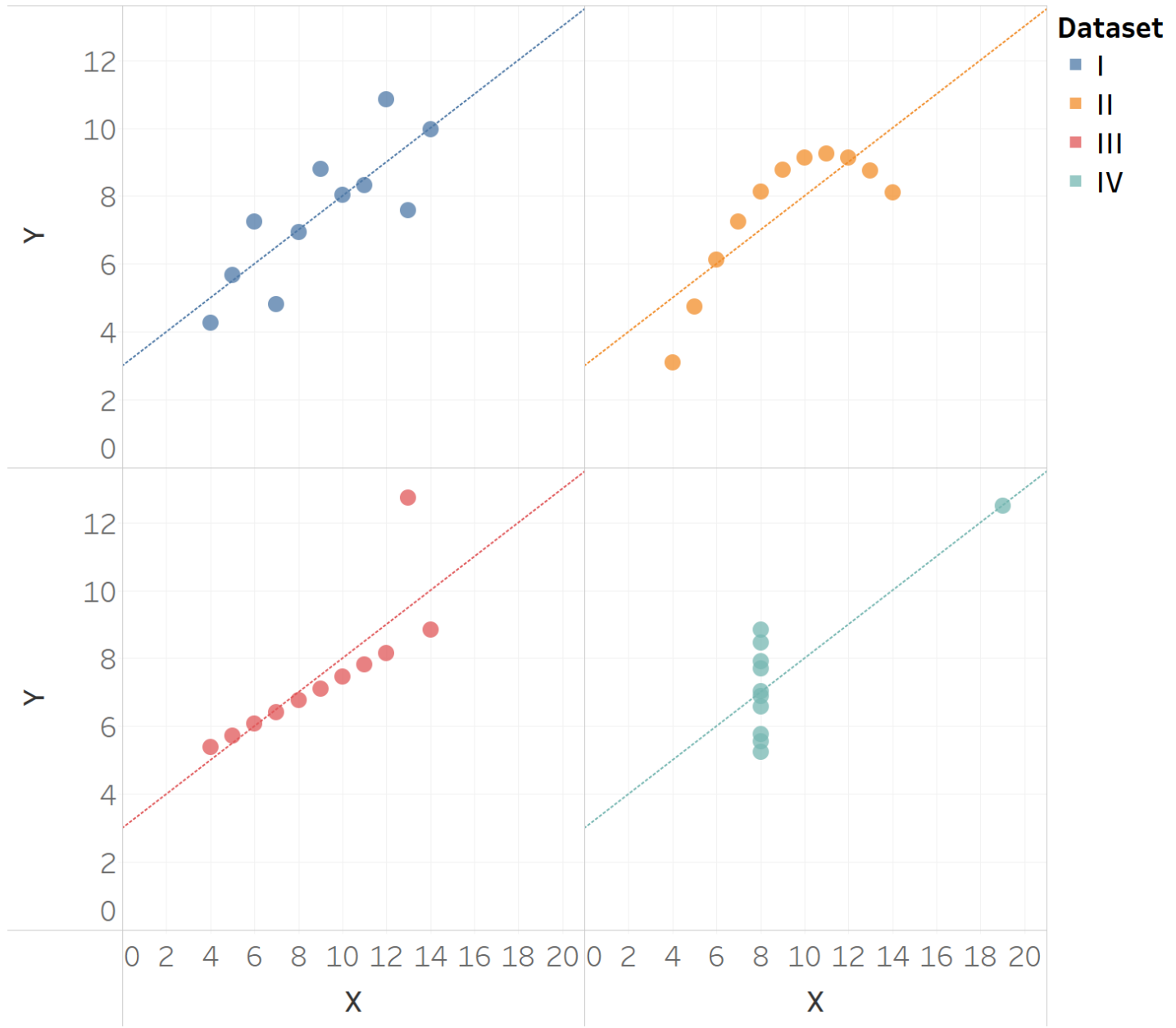
Sum of X vs. sum of Y broken down by IF [Dataset] == "I" OR [Dataset] == "III" THEN "1" ELSE "2" END vs. IF [Dataset] == "I" OR [Dataset] == "II" THEN "1" ELSE "2" END. Color shows details about Dataset. Details are shown for Id.

Datasaurus I
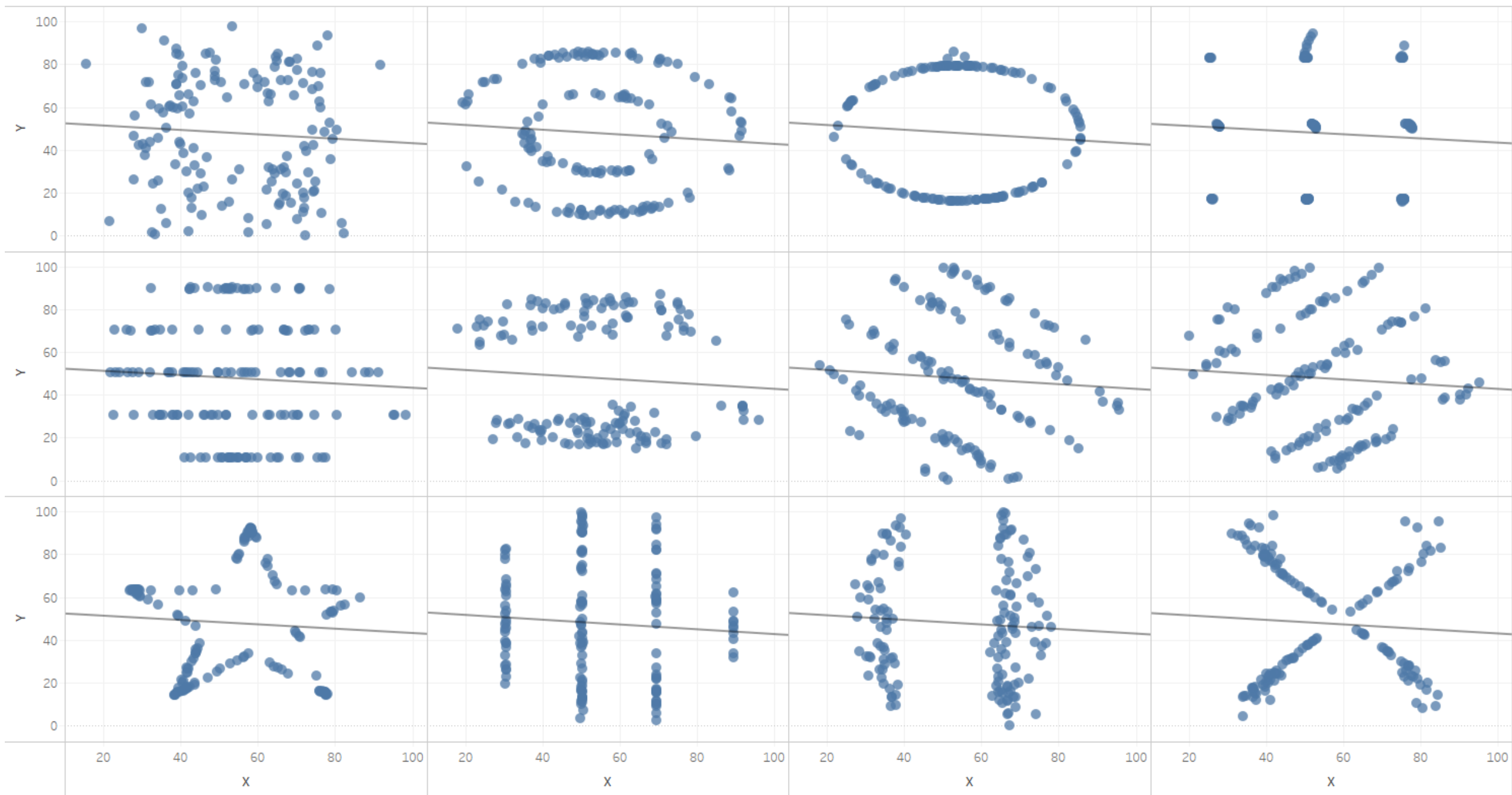
X vs. Y broken down by IF [Dataset] == "away" OR [Dataset] == "h_lines" OR [Dataset]... vs. IF [Dataset] == "away" OR [Dataset] == "bullseye" OR [Dataset].... The data is filtered on Dataset, which excludes dino.

Datasaurus II
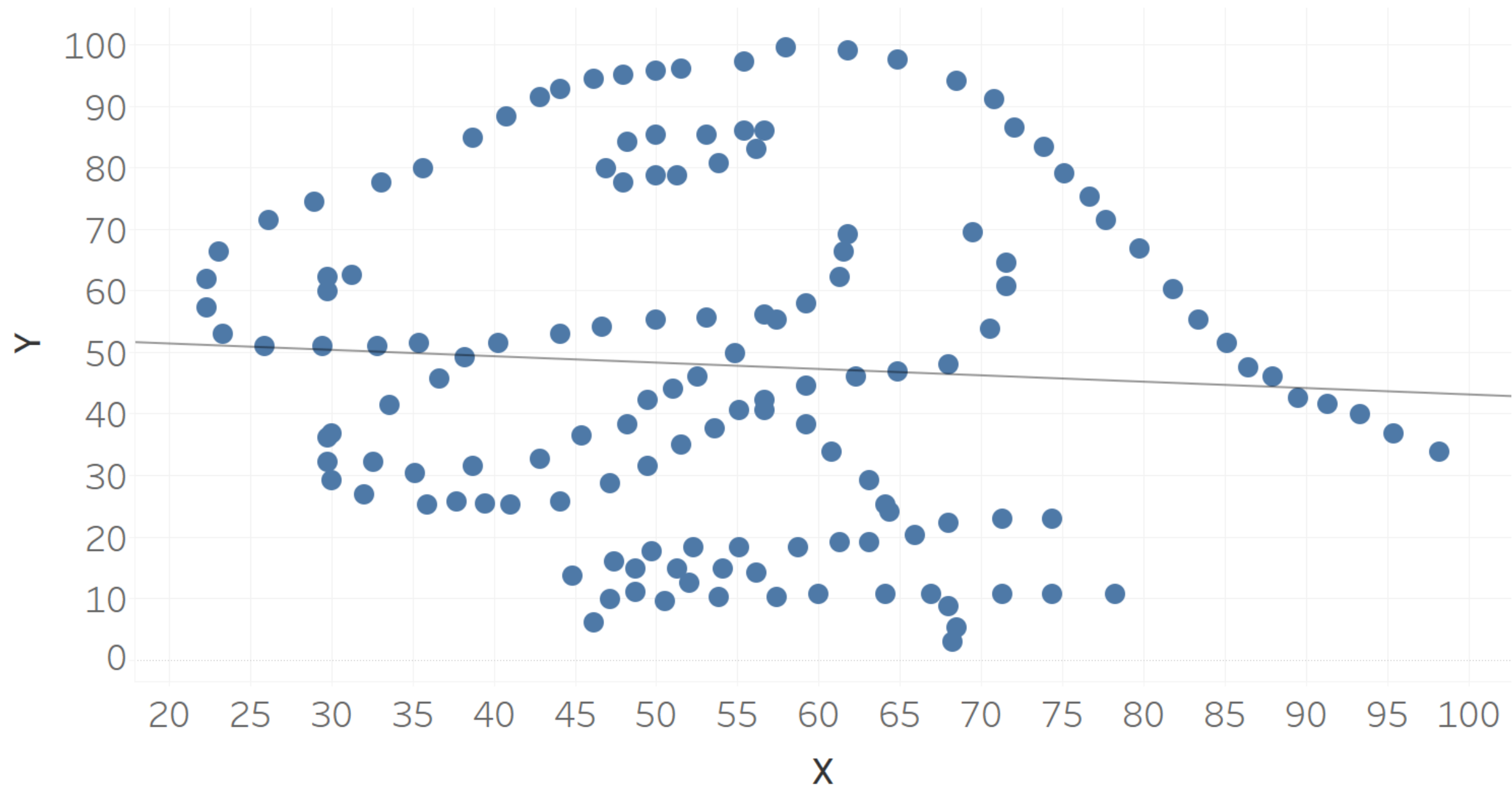
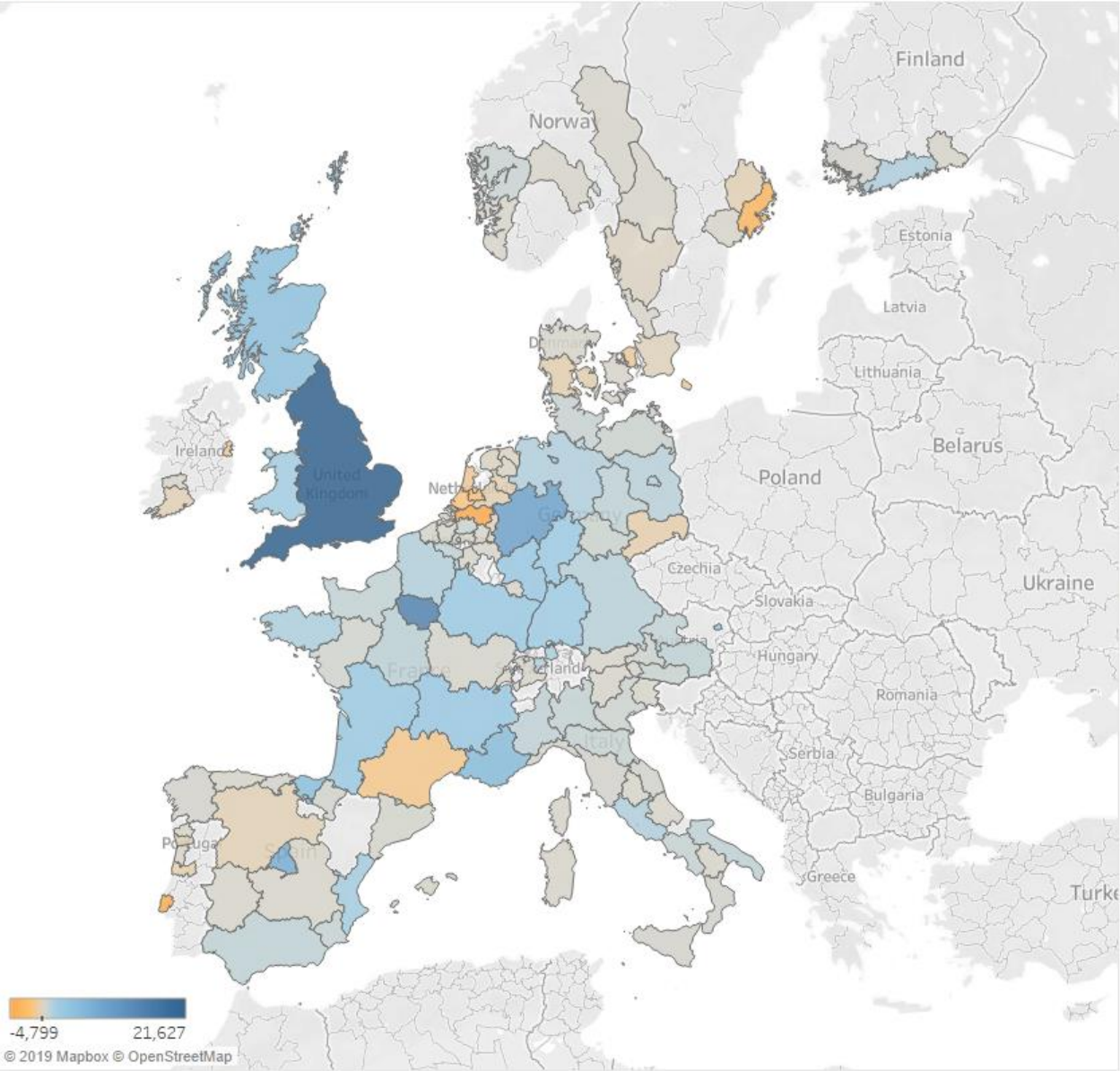X vs. Y. The data is filtered on Dataset, which keeps dino.

Sales & Profit Overview

Sales

Year of Order Date	Sub-Category	Central						North					
		Austria	Belgium	France	Germany	Netherlands	Switzerland	Denmark	Finland	Ireland	Norway	Sweden	United Kingdom
2017	Accessories	€1,292	€668	€13,132	€9,562	€683		€299	€224	€54	€461	€637	€4,460
	Appliances	€4,910	€1,870	€25,228	€4,515	€637		€217		€356		€1,342	€14,924
	Art	€1,583	€1,048	€13,142	€10,509	€1,156	€467	€84	€171	€254	€258	€224	€5,151
	Binders	€1,441	€431	€8,923	€4,717	€879		€80	€82	€171	€362	€248	€3,334
	Bookcases	€3,786	€615	€19,985	€17,508	€2,113			€2,861	€304	€508	€1,134	€12,807
	Chairs	€230	€946	€28,589	€10,087	€3,062	€3,524	€920		€267		€96	€6,911
	Copiers	€1,582	€382	€26,424	€18,940	€2,387	€3,422	€264		€482	€636		€16,917
	Envelopes		€329	€3,465	€3,728	€56	€384	€105		€35	€110	€294	€2,708
	Fasteners	€41	€58	€1,610	€1,125	€37		€61	€33	€52		€84	€837
	Furnishings	€762	€370	€5,743	€6,505	€652	€251	€36		€40		€239	€1,598
	Labels	€77	€134	€1,165	€733	€164	€67			€55	€28	€20	€378
	Machines	€1,330		€22,365	€6,945	€2,070	€605	€431	€769		€1,533		€10,782
	Paper	€357	€511	€4,005	€2,726	€300	€149	€50	€64	€27		€59	€1,377
	Phones	€1,350		€24,619	€23,750	€3,388	€304	€353	€1,172	€1,217		€108	€13,173
	Storage	€2,909	€1,494	€22,860	€16,500	€2,236	€652	€608	€712	€267		€294	€15,265
	Supplies	€292	€88	€2,889	€3,363	€419		€103				€89	€1,874
	Tables		€541	€7,470	€6,758	€827						€954	€11,551
2018	Accessories	€606	€446	€6,734	€4,638	€145					€335	€237	€7,295
	Appliances	€352		€10,617	€8,862			€81					€8,794
	Art	€186	€414	€7,284	€4,133	€399				€263	€449	€361	€4,392
	Binders	€440	€257	€4,760	€2,633	€451	€32	€3		€13	€467	€61	€2,533
	Bookcases	€1,101	€1,169	€18,804	€9,718	€1,109			€594	€292		€3,361	€11,709
	Chairs	€436	€1,098	€9,400	€12,345	€799		€32		€487	€1,032		€3,697
	Copiers	€1,796		€20,847	€8,765	€1,758				€450		€454	€15,324
	Envelopes	€198	€22	€1,221	€1,708	€135						€133	€1,300
	Fasteners	€114	€92	€591	€532	€89		€17				€62	€773
	Furnishings	€708	€575	€3,591	€785	€1,273		€231	€100			€296	€950
	Labels	€112	€10	€935	€507	€42						€29	€408
	Machines	€393		€12,066	€8,783	€93	€1,101				€2,021		€9,537
	Paper	€175	€121	€2,061	€1,192	€223		€50		€34		€59	€747
	Phones	€265	€1,335	€9,522	€14,919	€397		€657				€522	€9,677
	Storage	€1,467	€2,187	€25,448	€9,458	€1,264	€115	€316		€745		€1,130	€11,138
	Supplies	€113		€2,159	€1,635	€77		€87	€156			€45	€1,626
	Tables			€3,660	€6,585							€1,364	€7,508

Profit

Year of Order Date	Sub-Category	Central						North					
		Austria	Belgium	France	Germany	Netherlands	Switzerland	Denmark	Finland	Ireland	Norway	Sweden	United Kingdom
2017	Accessories	€463	€120	€3,774	€1,398	-€375		-€197	€105	-€44	€87	-€323	€1,052
	Appliances	€1,166	€229	€3,118	€1,122	-€149		-€133		-€334		-€755	€4,049
	Art	€379	€266	€2,584	€2,269	-€558	€58	-€35	€26	-€120	€43	-€145	€965
	Binders	€333	€132	€1,837	€1,289	-€506		-€18	€16	-€99	€101	-€181	€547
	Bookcases	€1,074	€154	€4,067	€2,899	-€1,266			€974	-€18	€208	-€580	€2,777
	Chairs	€11	€182	€6,098	€2,024	-€2,519	€1,325	-€276		-€105		-€8	€1,252
	Copiers	€180	€92	€2,032	€4,610	-€694	€1,061	-€132		-€145	€146		€3,877
	Envelopes		€148	€771	€997	-€10	€80	-€18		-€33	€27	-€68	€659
	Fasteners	€20	€17	€270	€344	-€2		-€36	€11	-€17		-€49	€188
	Furnishings	€211	€52	€1,420	€1,712	€87	€40	-€49		-€47		-€199	-€243
	Labels	€11	€14	€305	€237	-€73	€7			-€26	€0	-€1	€61
	Machines	€223		€1,437	€847	-€1,660	€266	-€103	€169		€506		€2,646
	Paper	€128	€109	€795	€656	-€133	€4	-€38	€6	-€17		-€31	€249
	Phones	€274		€1,326	€5,385	-€1,517	€64	-€249	€229	-€480		-€13	€3,417
	Storage	€820	€535	€3,269	€2,721	-€1,163	€130	-€395	€142	-€59		-€136	€2,343
	Supplies	€56	€29	€357	€892	-€274		-€2				-€67	€444
	Tables		€49	-€1,143	-€2,344	-€1,039						-€1,558	€3,414
2018	Accessories	€151	€53	€1,608	€1,544	-€53					€110	-€55	€1,914
	Appliances	€18		€1,327	-€38			-€44					€679
	Art	€21	€80	€1,858	€1,037	-€191				-€197	€108	-€162	€815
	Binders	€57	€64	€1,113	€750	-€140	€8	-€2		-€1	€138	-€50	€596
	Bookcases	€352	€402	€2,222	€1,484	-€480			€89	-€204		-€2,459	€2,092
	Chairs	€129	€204	€996	€1,803	-€410		-€12		-€232	€124		€816
	Copiers	€706		€1,542	€1,599	-€892				-€90		-€235	€4,458
	Envelopes	€56	€11	€220	€380	-€76						-€91	€343
	Fasteners	€33	€26	€140	€93	-€20		-€3				-€15	€173
	Furnishings	€181	€252	€888	€218	-€145		-€272	€16			-€334	-€158
	Labels	€49	€2	€231	€78	-€9						-€18	€97
	Machines	€114		€405	€1,781	-€21	€319				€45		€1,590
	Paper	€46	€15	€398	€231	-€108		-€4		-€22		-€46	€195
	Phones	€13	€374	-€1,398	€3,679	-€210		-€66				-€217	€1,620
	Storage	€389	€396	€3,648	€1,168	-€403	€14	-€274		-€411		-€629	€993
	Supplies	€54		€647	€487	-€69		-€78	-€156			-€2	€121
	Tables			-€375	-€1,423							-€1,864	€536

Profit Analysis

Map

-4,799   21,627

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Profit KPI Comparison: 2017 and Previous Year

Category	Sub-Catego..	
Furniture	Bookcases	153.4%
	Chairs	99.2%
	Furnishings	138.6%
	Tables	2.7%
Office Supplies	Appliances	128.4%
	Art	110.1%
	Binders	0.2%
	Envelopes	165.6%
	Fasteners	79.3%
	Labels	84.0%
	Paper	142.1%
	Storage	115.1%
	Supplies	31.1%
Technology	Accessories	127.3%
	Copiers	153.6%
	Machines	51.5%
	Phones	43.4%

-5K   0K   5K   10K   15K

Profit Timeline

15K

10K

5K

0K

KPI

April 2017   August 2017   December 2017   April 2018   August 2018

Month of Order Date
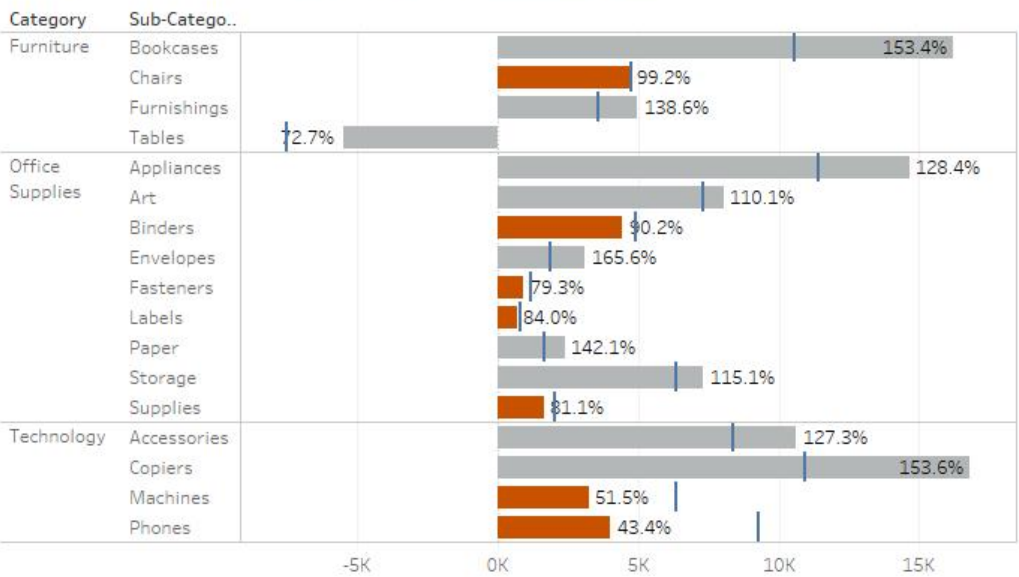
Order Date
2017-01-01 to 2018-08-02

The Beautiful Science of
Data Visualization

4	7	7	5	5	2	7	4	7	1
4	9	2	5	7	7	2	6	1	7
1	7	6	9	3	4	7	5	1	2
5	1	6	3	3	8	4	8	6	6
6	5	6	4	9	3	8	9	1	9
3	8	1	5	2	2	3	6	3	9
4	6	4	5	6	3	7	7	9	1
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8	1	1	8	7	5	8	1	7	4
3	6	9	2	8	9	3	7	5	7
4	4	4	2	8	2	2	9	2	8

4	7	7	**5**	**5**	2	7	4	7	1
4	9	2	**5**	7	7	2	6	1	7
1	7	6	9	3	4	7	**5**	1	2
5	1	6	3	3	8	4	8	6	6
6	**5**	6	4	9	3	8	9	1	9
3	8	1	**5**	2	2	3	6	3	9
4	6	4	**5**	6	3	7	7	9	1
9	1	3	3	6	1	3	3	1	8
8	1	1	8	7	**5**	8	1	7	4
3	6	9	2	8	9	3	7	**5**	7
4	4	4	2	8	2	2	9	2	8

4	7	7	5	5	2	7	4	7	1
4	9	2	5	7	7	2	6	1	7
1	7	6	9	3	4	7	5	1	2
5	1	6	3	3	8	4	8	6	6
6	5	6	4	9	3	8	9	1	9
3	8	1	5	2	2	3	6	3	9
4	6	4	5	6	3	7	7	9	1
9	1	3	3	6	1	3	3	1	8
8	1	1	8	7	5	8	1	7	4
3	6	9	2	8	9	3	7	5	7
4	4	4	2	8	2	2	9	2	8

Distribution

Value	Occurrences
7	15
3	14
1	14
6	12
4	12
9	11
8	11
2	11
5	10

Occurrences

Sum of Occurrences for each Value.
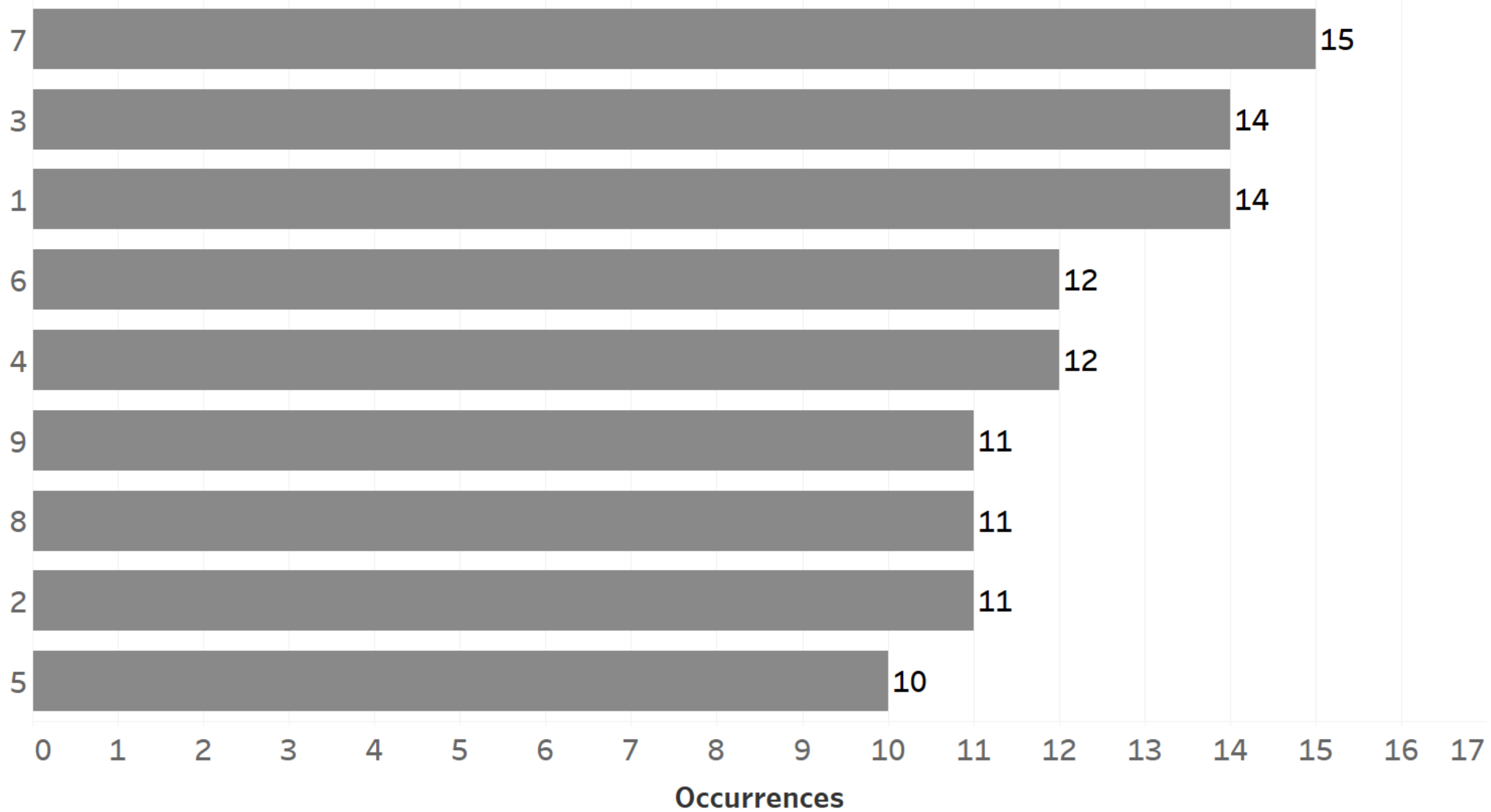
Form
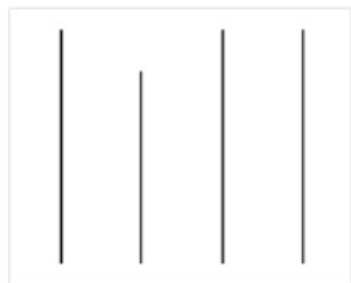
Length
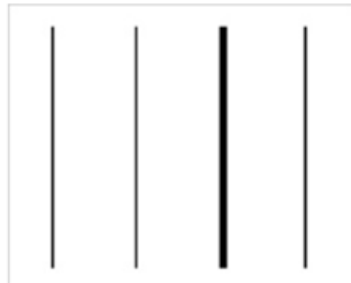
Width
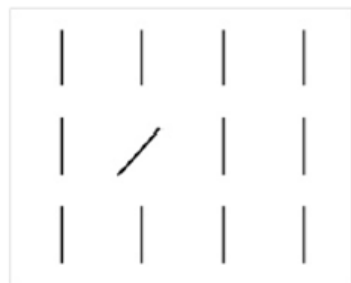
Orientation
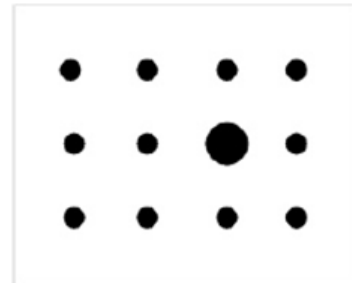
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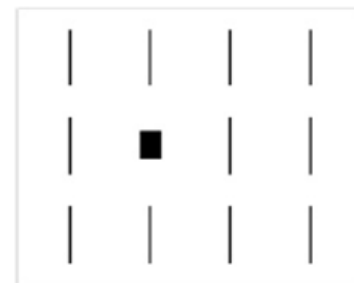
Shape
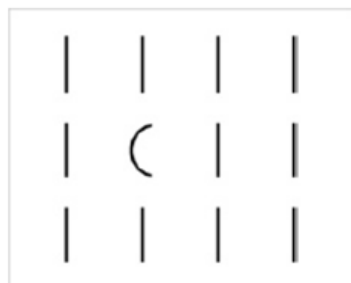
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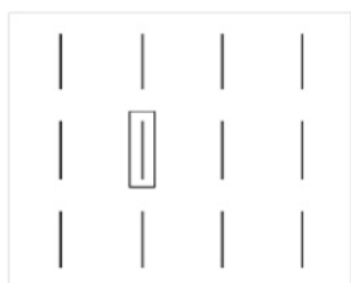
Enclosure
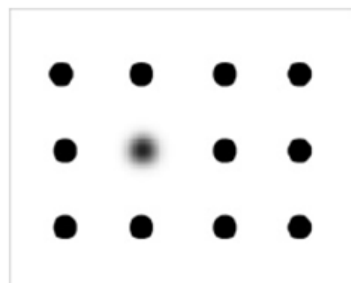
Blur

Color

Hue
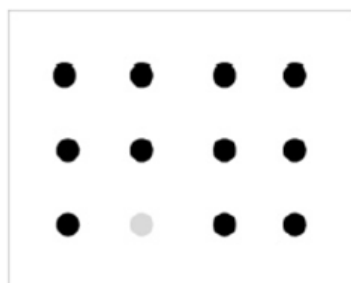
Intensity

Position

2-D position

Spatial Grouping

Motion

Direction of Motion

Gapminder Dataviz (originally by Hans Rosling) - 1950
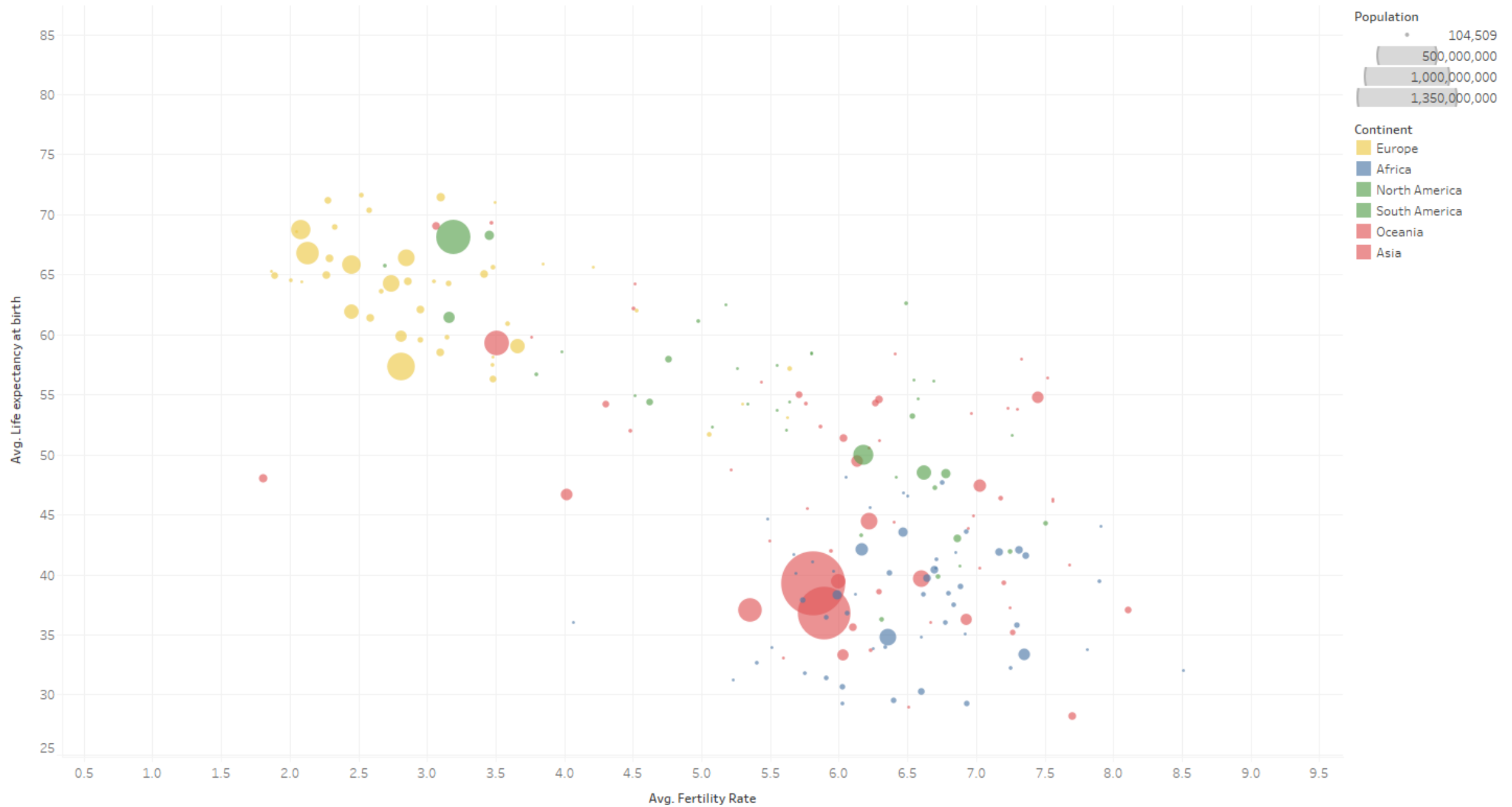
Average of Fertility Rate vs. average of Life expectancy at birth. Color shows details about Continent. Size shows sum of Population. Details are shown for Country and Year Year. The view is filtered on Country, which keeps 199 of 199 members.
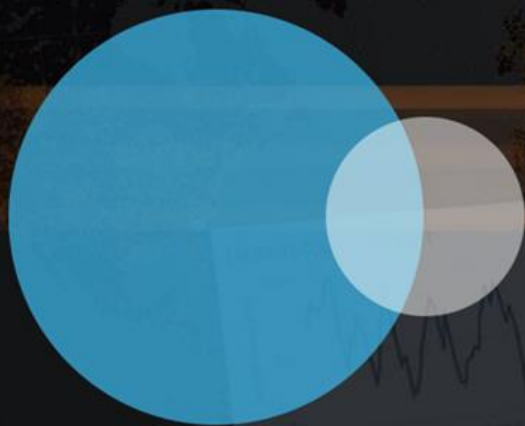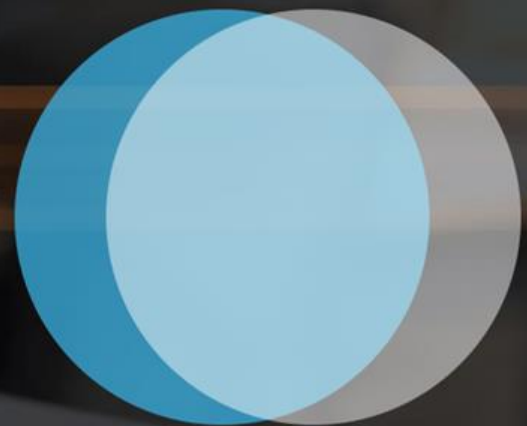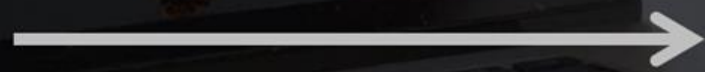
The people asking the questions should be the ones answering them

Map

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Weekday

Date and Time

Timeline

Day of Date and Time

Hour

Date and Time