

Are Graphical User Interfaces the answer to AI?

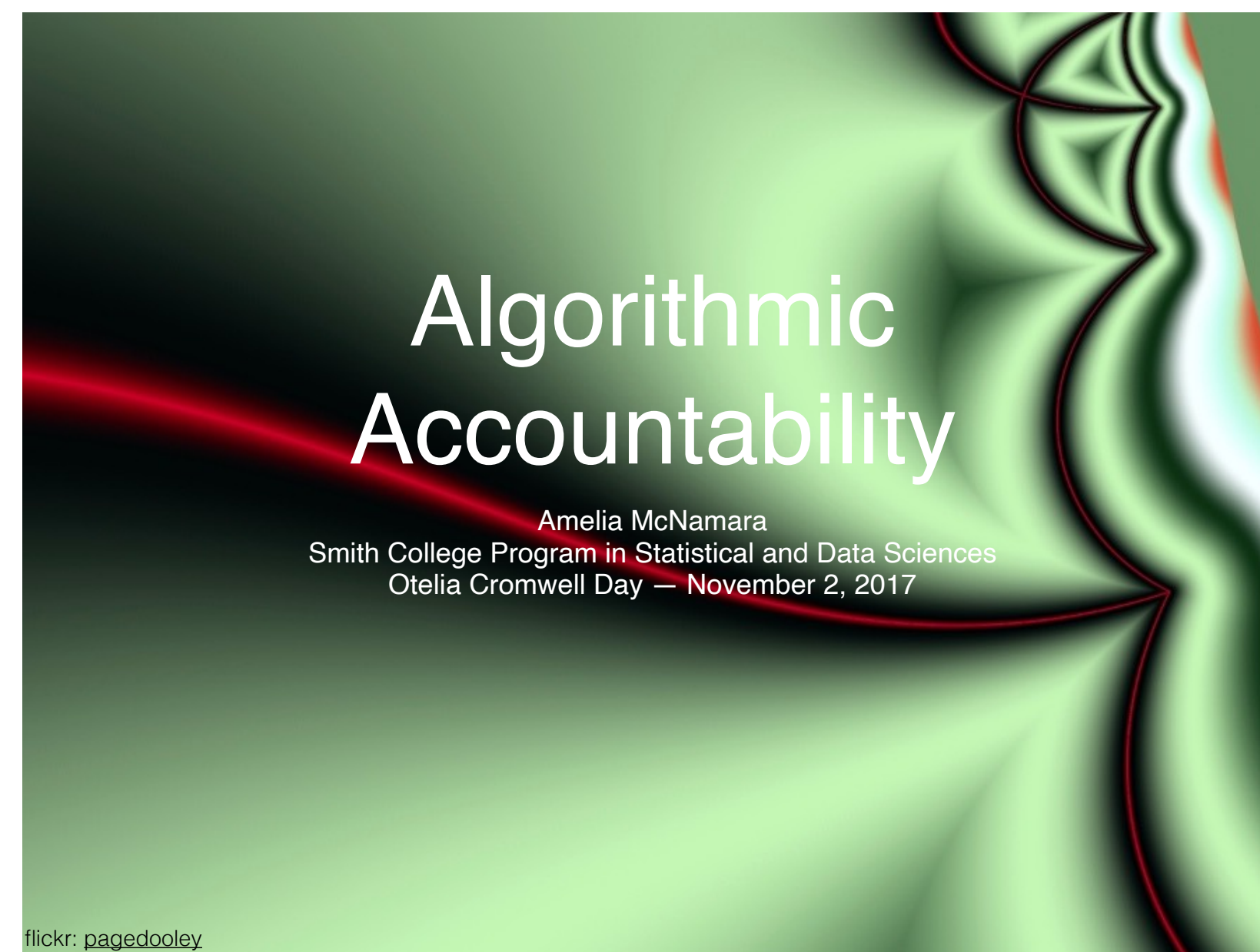
Amelia McNamara

University of St. Thomas department of Computer & Data Sciences

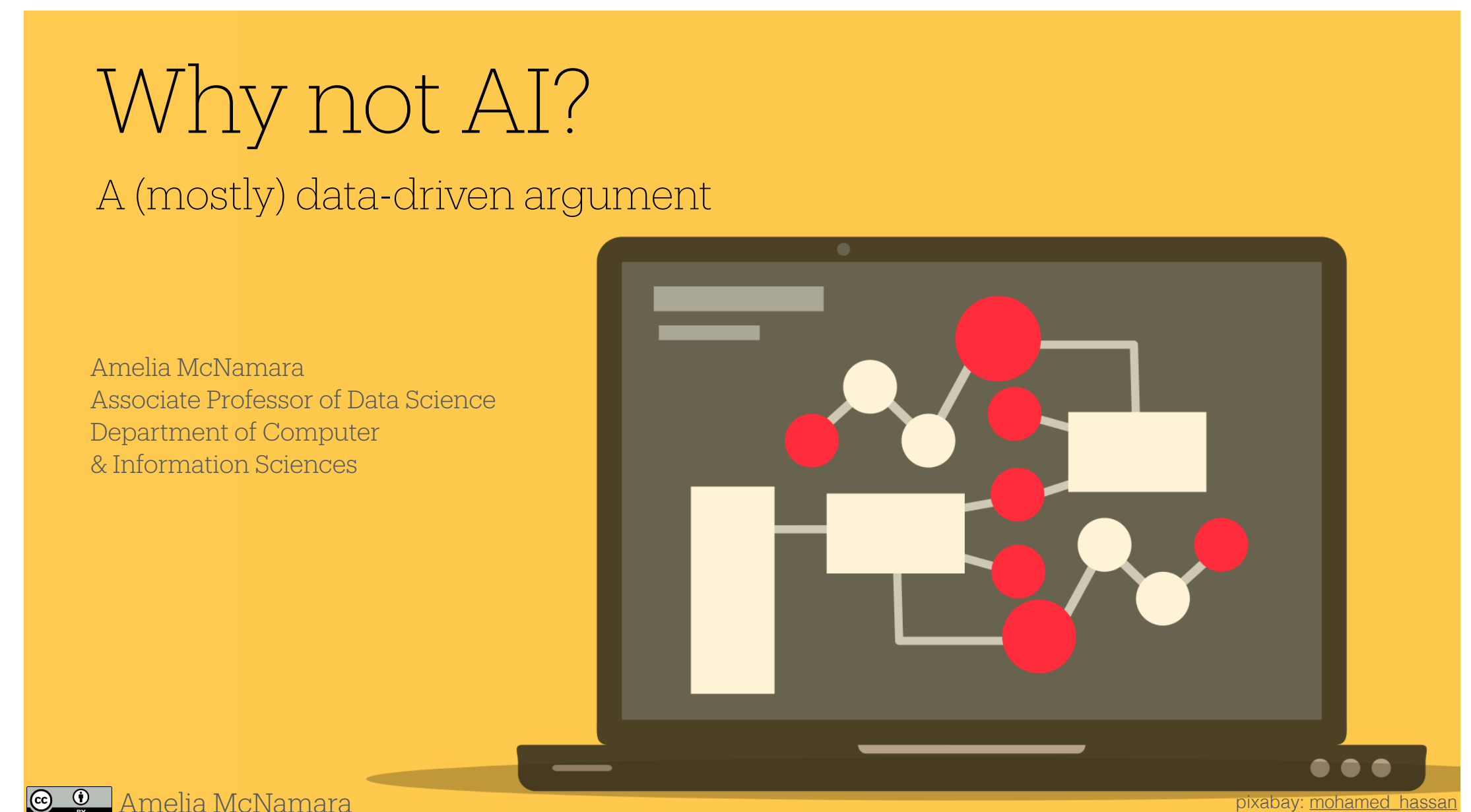
<https://amelia.mn>

“Any headline that ends in a question mark can be answered by the word no.”

- Betteridge's law of headlines



I've been on record
as anti-
generative AI for a
long time



AI Ethics & Policy News

File Edit View Insert Format Data Tools Extensions Help

150%

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A1:B1

These articles are tagged as MILITARIZATION.

	A	B	C	D	E	F	G
1	These articles are tagged as MILITARIZATION.						
2	Primary Categorization	Article (Title, Link)	Publication	Date			
3	Sustainability	Electricity costs rise amid data center boom	Axios	8/4/2025			
4	Sustainability	The AI explosion means millions are paying more for electricity	The Washington Post	7/27/2025			
5	Sustainability	Why more residents are saying 'No' to AI data centers in their backyard	Georgia Public Broadcastin	7/18/2025			
6	Sustainability	Electricity prices may spike due to AI demand if US doesn't boost energy outp	Fox Business	7/17/2025			
7	Sustainability	Their Water Taps Ran Dry When Meta Built Next Door	The New York Times	7/14/2025			
8	Sustainability	A Black Hole of Energy Use': Meta's Massive AI Data Center Is Stressing Out	404 Media	6/23/2025			
9	Sustainability	Your AI use could have a hidden environmental cost	CNN	6/22/2025			
10	Sustainability	ChatGPT isn't great for the planet. Here's how to use AI responsibly.	The Washington Post	6/19/2025			
11	Sustainability	How Much Energy Does AI Use? The People Who Know Aren't Saying	WIRED	6/19/2025			
12	Sustainability	Can You Choose an A.I. Model That Harms the Planet Less?	The New York Times	6/18/2025			
13	Sustainability	Sam Altman claims an average ChatGPT query uses 'roughly one fifteenth of	The Verge	6/10/2025			
14	Sustainability	AI Is Eating Data Center Power Demand—and It's Only Getting Worse	WIRED	5/22/2025			
15	Sustainability	AI power demand is generating hallucinations	Reuters	5/20/2025			
16	Sustainability	We did the math on AI's energy footprint. Here's the story you haven't heard.	MIT Technology Review	5/20/2025			
17	Sustainability	ChatGPT Is Everywhere — Why Aren't We Talking About Its Environmental C	Teen Vogue	5/7/2025			
18	Sustainability	Data centers say Trump's crackdown on renewables bad for business, AI	Ars Technica	5/6/2025			
19	Sustainability	AI industry to Congress: 'We need energy'	The Washington Post	4/10/2025			
20	Sustainability	Can we make AI less power-hungry? These researchers are working on it.	Ars Technica	3/24/2025			
21	Sustainability	The AI Economy's Massive Vulnerability	Foreign Policy	2/20/2025			
22	Sustainability	ChatGPT may not be as power-hungry as once assumed	TechCrunch	2/11/2025			
23	Sustainability	AI may produce millions of tonnes of electronic waste by 2030, study finds	South China Morning Post	11/4/2024			
24	Sustainability	AI boom thrusts Europe between power-hungry data centers and environmen	CNBC	10/29/2024			
25	Sustainability	The A.I. Power Grab	The New York Times	10/22/2024			
26	Sustainability	Is AI More Sustainable if You Generate It Underwater?	WIRED	9/26/2024			
27	Sustainability	Demand for AI is driving data center water consumption sky high	TechCrunch	8/19/2024			
28	Sustainability	US utilities signal booming demand from data centers as AI takes root	Reuters	8/12/2024			
29	Sustainability	Energy Secretary Addresses Concerns Over AI's Growing Electricity Deman	Newswatch	8/12/2024			

IP Militarization Misinformation Privacy Risk Regulation Security Sustainability W < >

AI Ethics and Policy News spreadsheet, organized by Casey Fiesler



Karl Broman
@kwbroman

Following

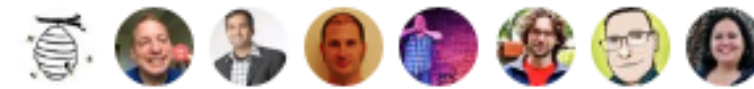


.@xieyihui's homework to reinforce repro research:

- week 1: analyze these data
- week 2: [made some changes to those data] go back & redo

9:19 AM - 3 Aug 2016

3 Retweets 5 Likes



2 3 5



Tweet your reply



Karl Broman @kwbroman · 3 Aug 2016



Replying to @kwbroman

Audience member uses this approach but in wks 2 and 3 w/ week 1 being about how to do things reproducibly. #JSM2016

Karl Broman @kwbroman

.@xieyihui's homework to reinforce repro research:

- week 1: analyze these data
- week 2: [made some changes to those data] go back & redo

1



Noam Ross @noamross · 3 Aug 2016



Replying to @kwbroman @xieyihui

Doesn't @JennyBryan do this, but the students' *classmate* has to redo their analysis?

DASC 336: Data Communication and Visualization

← → ↻ 🏠

🔒 ameliamn.github.io/DASC336/

📄 150% ☆

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DASC 336: Data Communication and Visualization

About the Course

Instructor

Dr. Amelia McNamara (she/her), amelia.mcnamara@stthomas.edu

Office hours: Mondays 11 am - noon and Fridays 1-2 pm, and by appointment. All office hours on Zoom. Links to attend are available in the first Module of the course.

Class meetings

- Tuesday/Thursday 9:55-11:35 am, OSS 428

Course description

This course will prepare students to effectively communicate the insights from data analysis. The course will cover the three main methods of communicating information about data—visually, orally, and in writing. Students will learn to tailor their communication to their audience and create publication-ready and boardroom-ready presentations of their results.

Prerequisites: CISC 130 or 131; and DASC 112, DASC 120, STAT 303, or STAT 314.

Course Goals

- Learn appropriate methods for visualizing and communicating data, both numerical and categorical.
- Develop technical skills using spreadsheets, Tableau, and R, to visualize and communicate data.
- Apply course material to communications you find in the wild, and datasets that interest you.

Textbooks

There is no required textbook. Every week there will be readings provided from a variety of texts, including:

- Communicating with Data: The Art of Writing for Data Science (Deborah Nolan and Sara Stoudt)
- Data Feminism (Catherine D'Ignazio and Lauren Klein)
- Numbers in the Newsroom (Sarah Cohen)
- The Functional Art (Alberto Cairo)
- Visualize This (Nathan Yau)
- How to Lie with Statistics (Darrell Huff)
- Living in Data (Jer Thorp)
- The Visual Display of Quantitative Information (Edward Tufte)

This is a closed book, closed note quiz. There are no authorized resources for use on this quiz. Violations of the Academic Integrity Policy will be reported to the dean. Please sign below, to indicate you have read the instructions and agree to abide by the Academic Integrity Policy in taking this quiz.

Print name

Sign name

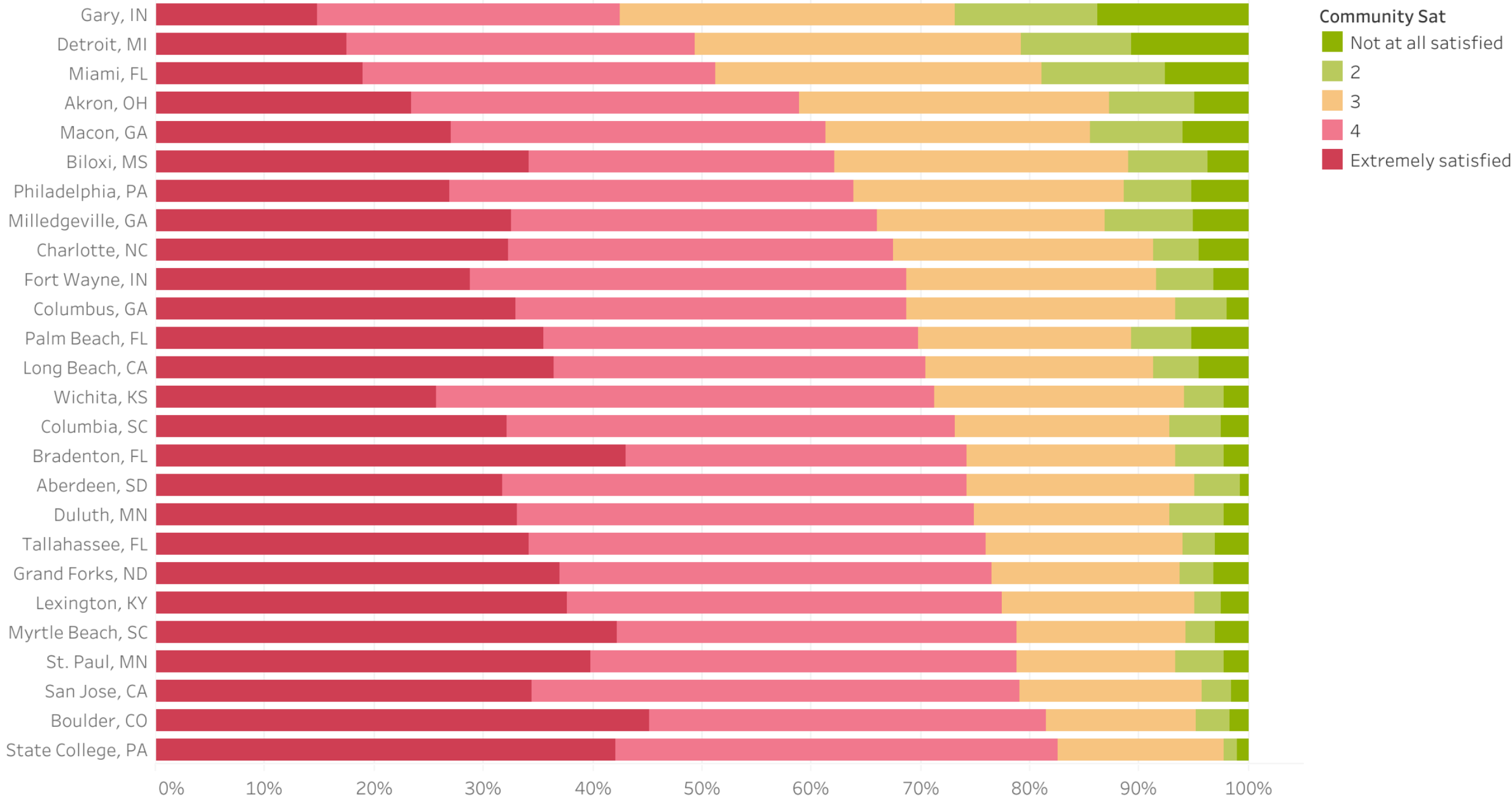
Questions 1 and 2 reference the Soul of the Community data and visualizations. The data is from the Knight Foundation, collected across 26 communities (cities or metro areas of the United States) in 2008, 2009, and 2010.

1. How would the data shown in Figure 1 need to be wrangled, summarized, reshaped, or changed in order to make it possible to create the visualization(s) shown in Figure 2? Describe the process using words or pseudocode. If your wrangling will produce variables with new names, include the variable names.

2. Using either ggplot2 syntax or describing where you would drop things in the Tableau interface, provide instructions on how to create a simple version of the visualization(s) shown in Figure 2. You can reference Figure 3 for an empty version of the Tableau interface. [There are at least two valid ways to do this in both ggplot2 and Tableau.]

	year	CASE	citystate	area_descrip	community_sat	affordable_housing	employment
1	2010	19114	Philadelphia, PA	Or something else	2	Very good	Unemployed but looking for work
2	2010	18505	Miami, FL	A city or urban area	3	2	Employed full-time
3	2010	16268	St. Paul, MN	A suburb	Extremely satisfied	4	Employed full-time
4	2010	16055	Biloxi, MS	A city or urban area	2	3	Retired
5	2010	15649	Biloxi, MS	A rural area	NA	2	Employed part-time
6	2010	13938	Detroit, MI	A city or urban area	2	Very bad	Retired
7	2008	13662	Miami, FL	A city or urban area	Not at all satisfied	Very bad	(Other) (do not list)
8	2009	13658	Detroit, MI	A suburb	Not at all satisfied	3	Employed part-time
9	2009	13600	Biloxi, MS	Or something else	Not at all satisfied	Very bad	Employed part-time
10	2009	13586	Biloxi, MS	A suburb	Extremely satisfied	4	Retired
11	2008	13368	Biloxi, MS	A rural area	(DK)	3	Retired
12	2008	13004	Long Beach, CA	A suburb	4	2	Employed full-time
13	2010	12967	Tallahassee, FL	A rural area	Not at all satisfied	Very bad	Unemployed but looking for work
14	2009	12696	Detroit, MI	A city or urban area	3	4	Retired
15	2008	12601	Miami, FL	A city or urban area	3	2	Employed full-time
16	2010	12379	St. Paul, MN	NA	NA	NA	NA
17	2008	12322	Charlotte, NC	A city or urban area	(DK)	3	Retired
18	2010	12015	Philadelphia, PA	NA	NA	NA	NA

Community satisfaction, 2008



This is a closed book, closed note quiz. There are no authorized resources for use on this quiz. Violations of the Academic Integrity Policy will be reported to the dean. Please sign below, to indicate you have read the instructions and agree to abide by the Academic Integrity Policy in taking this quiz.

Print name

Sign name

Questions 1 and 2 reference the map created by the Bureau of Labor Statistics shown in Figure 2.

- How would the data shown in Figure 1 need to be wrangled, summarized, reshaped, or changed in order to make it possible to create the visualization(s) shown in Figure 2? Describe the process using words or pseudocode. If your wrangling will produce variables with new names, include the variable names.
- Using either ggplot2 syntax or describing where you would drop things in the Tableau interface, provide instructions on how to create a simple version of the visualization shown in Figure 2. You can reference Figure 3 for an empty version of the Tableau interface.

State	March 2024 employment (thousands)	March 2025 employment (thousands)
Alabama	2,187.00	2,207.70
Alaska	333.5	338.2
Arizona	3,266.20	3,256.40
Arkansas	1,364.50	1,381.50
California	17,931.10	17,977.60
Colorado	2,970.50	2,972.80
Connecticut	1,705.40	1,711.40
Delaware	489.1	493.2
District of C	769.4	769.7
Florida	9,915.00	10,050.00

Figure 1: Data from the Bureau of Labor Statistics. Change in nonfarm employment by state, March 2024 to March 2025, seasonally adjusted

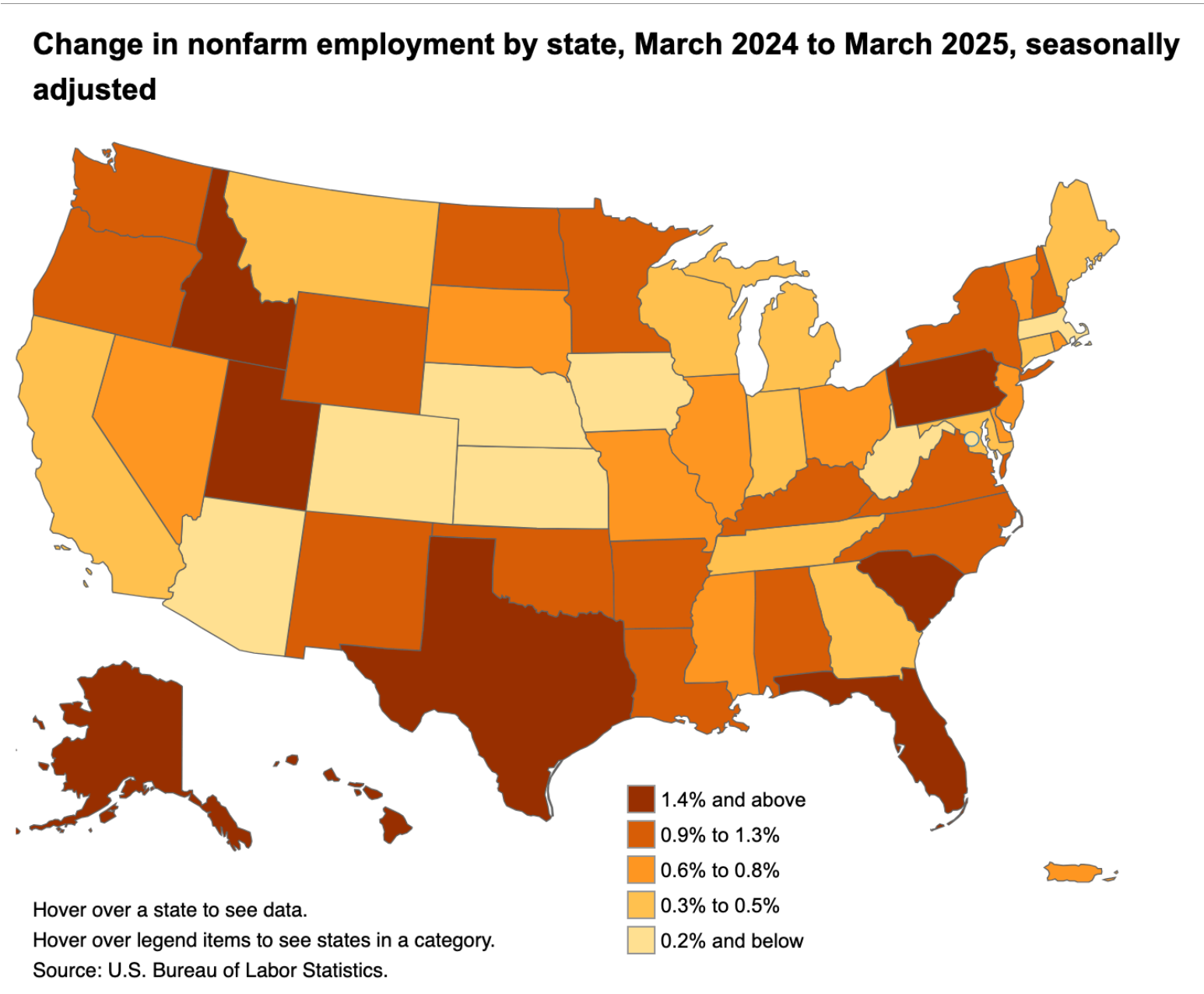
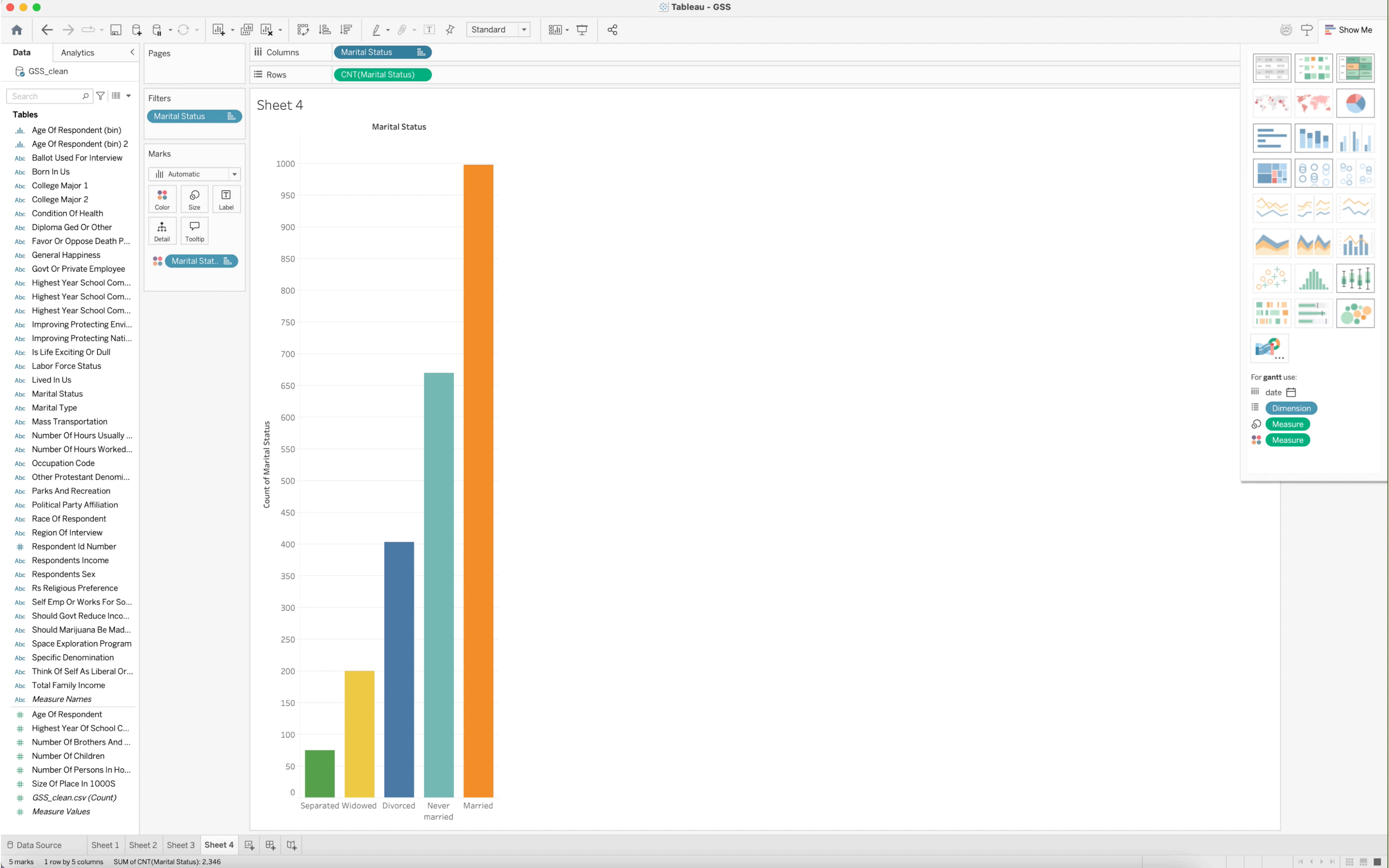
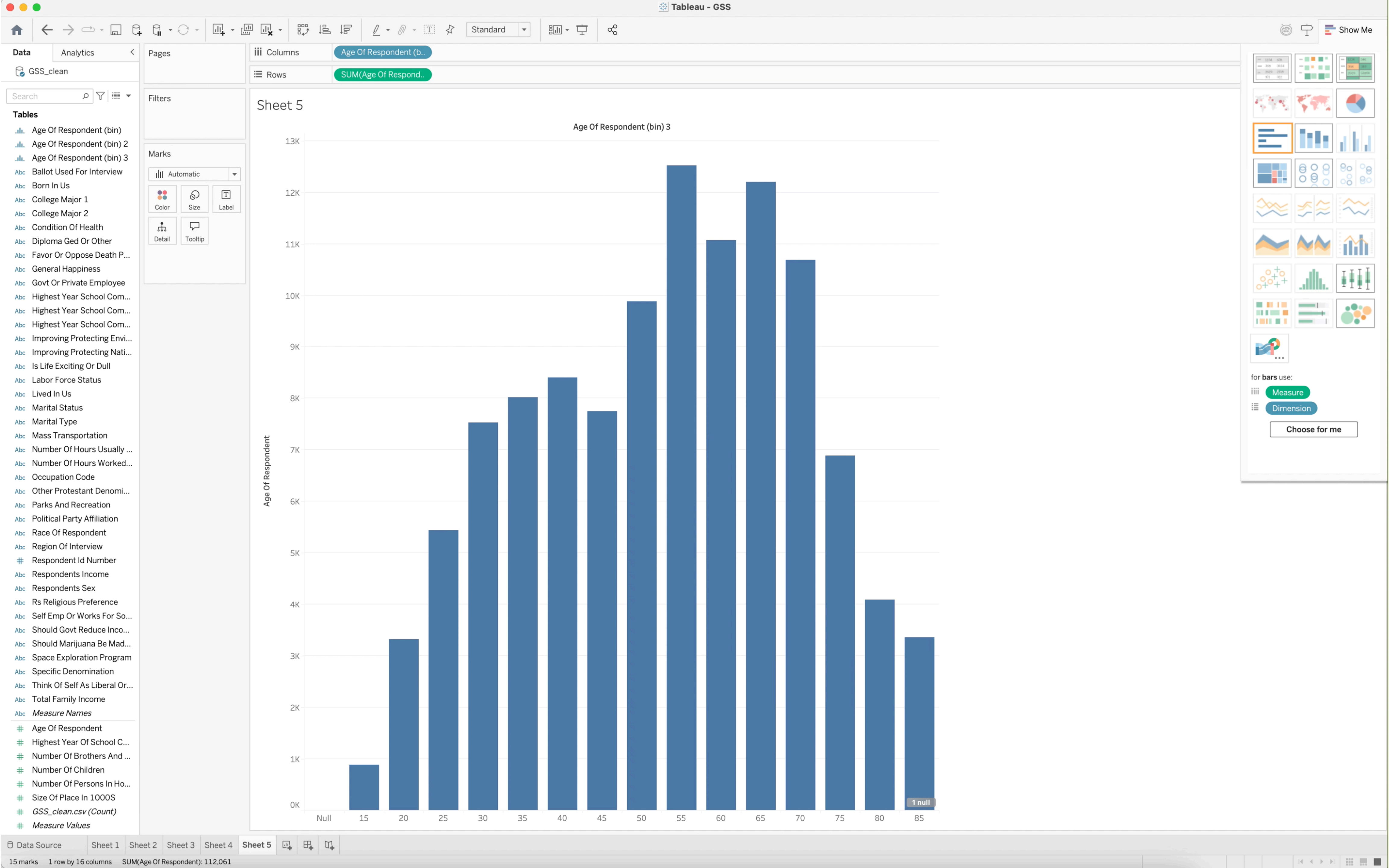
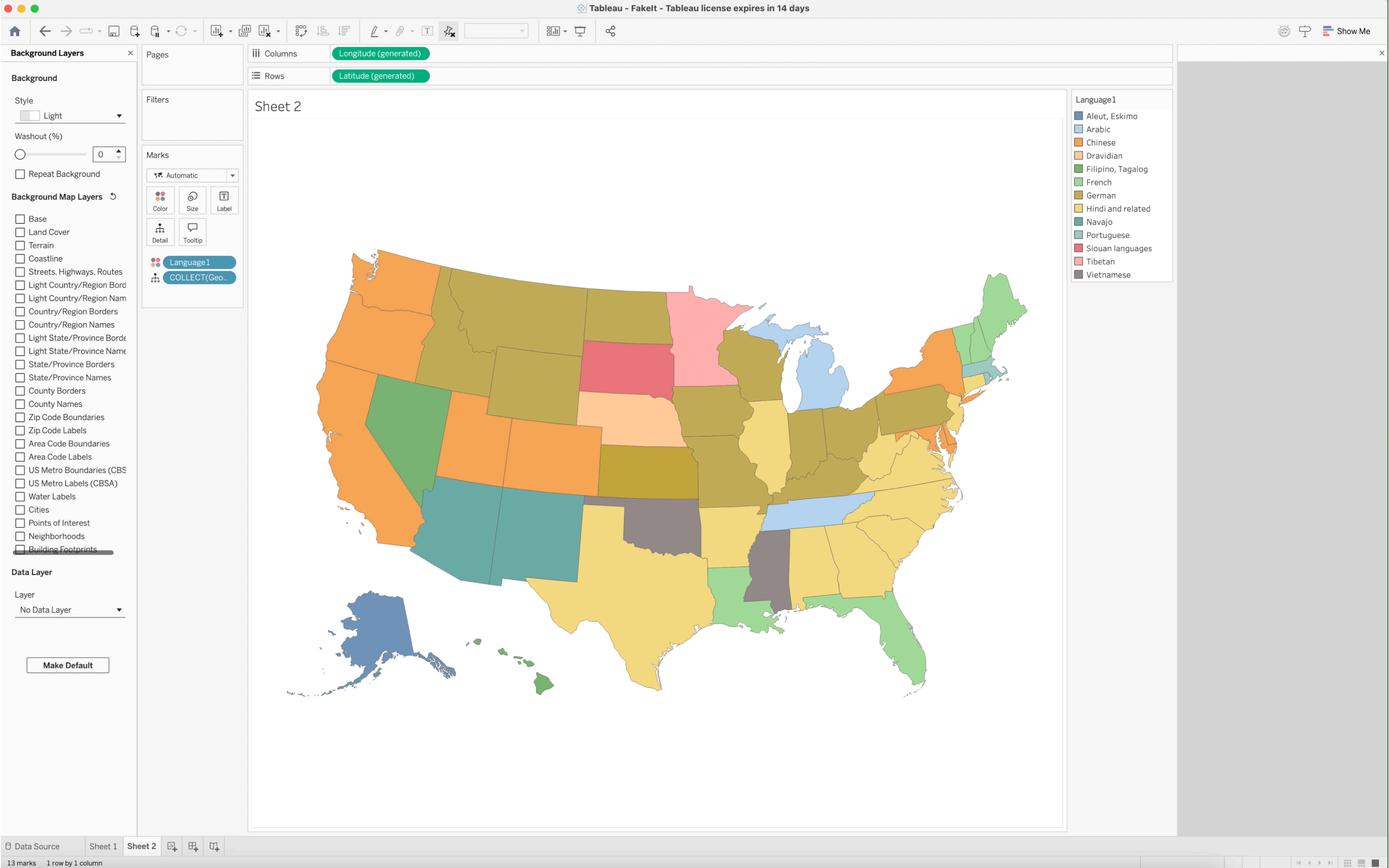


Figure 2: Graph created by the Bureau of Labor Statistics







Low- to no-code
data science

Data Literacy Course (Re)Design Institute

Home

Daily schedules and resources

Monday

Tuesday

Wednesday

Thursday

Friday

Activities

Syllabus review

Finding data

Unpacking charts

Hand-drawn data

Datawrapper

Unpacking headlines

Analyzing data

Reading story maps

ArcGIS StoryMaps

Markdown and GitHub pages

Resources

For learning R

For learning Tableau

Slides

Slide overview

Slide downloads

ameliamn.github.io/TulaneDataLiteracy/

150%

Data Literacy Course (Re)Design Institute Description

May 20-24, 2024

[Tulane University](#), co-sponsored by the [Center for Engaged Learning & Teaching](#) (CELT) and the [Connolly Alexander Institute for Data Science](#) (CAIDS)

Leader

Dr. Amelia McNamara (she/her), amelia.mcnamara@stthomas.edu

Institute description

This weeklong in-person institute will provide faculty from across a variety of disciplines the knowledge, resources, and support to (re)design a course infused with data literacy principles. Participants will leave with an understanding of digital and data technologies that could be introduced into their courses, sample assignments promoting data literacy, and a new or revised syllabus.

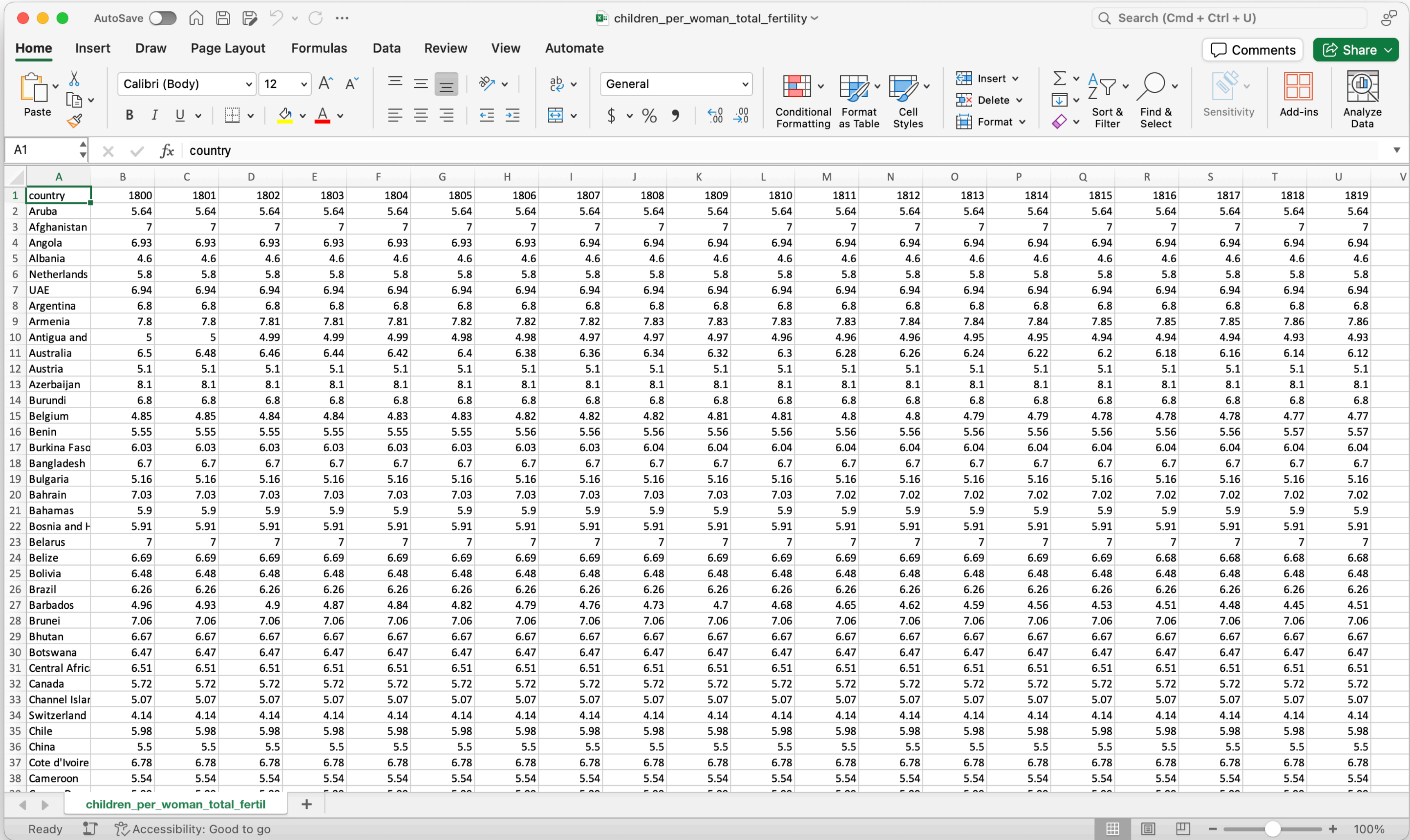
Institute goals

- Learn to identify data products, conceptualize of data structure, and find appropriate data for tasks online.
- Frame disciplinary questions as data questions, both from a professional (research) lens and at the instructional level.
- Experience new tools for data, including [Datawrapper](#) for data visualization, [Excel online](#) for data collection and analysis, [Voyant Tools](#) for text data analysis, [StoryMaps](#) for mapping and communication, [GitHub Pages](#) for simple webhosting and portfolio presentation, and LMMs like [ChatGPT](#) as a potential learning tool. Begin developing technical skills in these tools.
- Engage in sample data literacy assignments, including What’s Going On in This Graph?, Hand Drawn Data Visualization, Data Exhaust, Data Ethics, and more.
- Critique existing assignments and syllabi, and modify pedagogical materials to fit into an updated syllabus.

Tentative Schedule

The following is an outline of the institute. Please refer to the daily modules for more detailed information.

How else could this data be organized?



The screenshot shows a Microsoft Excel spreadsheet titled "children_per_woman_total_fertility". The spreadsheet contains a table with 21 columns (A to V) and 38 rows (1 to 38). The first column (A) lists countries, and the subsequent columns (B to V) contain numerical values representing fertility rates. The data is organized in a standard tabular format with rows representing individual countries and columns representing the fertility rate for each country.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	country	1800	1801	1802	1803	1804	1805	1806	1807	1808	1809	1810	1811	1812	1813	1814	1815	1816	1817	1818	1819	
2	Aruba	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.64
3	Afghanistan	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
4	Angola	6.93	6.93	6.93	6.93	6.93	6.93	6.93	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94
5	Albania	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
6	Netherlands	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8
7	UAE	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94
8	Argentina	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8
9	Armenia	7.8	7.8	7.81	7.81	7.81	7.82	7.82	7.82	7.83	7.83	7.83	7.83	7.84	7.84	7.84	7.85	7.85	7.85	7.86	7.86	7.86
10	Antigua and	5	5	4.99	4.99	4.99	4.98	4.98	4.97	4.97	4.97	4.96	4.96	4.96	4.95	4.95	4.94	4.94	4.94	4.93	4.93	4.93
11	Australia	6.5	6.48	6.46	6.44	6.42	6.4	6.38	6.36	6.34	6.32	6.3	6.28	6.26	6.24	6.22	6.2	6.18	6.16	6.14	6.12	6.12
12	Austria	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
13	Azerbaijan	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
14	Burundi	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8
15	Belgium	4.85	4.85	4.84	4.84	4.83	4.83	4.82	4.82	4.82	4.81	4.81	4.8	4.8	4.79	4.79	4.78	4.78	4.78	4.77	4.77	4.77
16	Benin	5.55	5.55	5.55	5.55	5.55	5.55	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.57	5.57	5.57
17	Burkina Faso	6.03	6.03	6.03	6.03	6.03	6.03	6.03	6.03	6.04	6.04	6.04	6.04	6.04	6.04	6.04	6.04	6.04	6.04	6.04	6.04	6.04
18	Bangladesh	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
19	Bulgaria	5.16	5.16	5.16	5.16	5.16	5.16	5.16	5.16	5.16	5.16	5.16	5.16	5.16	5.16	5.16	5.16	5.16	5.16	5.16	5.16	5.16
20	Bahrain	7.03	7.03	7.03	7.03	7.03	7.03	7.03	7.03	7.03	7.03	7.03	7.02	7.02	7.02	7.02	7.02	7.02	7.02	7.02	7.02	7.02
21	Bahamas	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
22	Bosnia and H	5.91	5.91	5.91	5.91	5.91	5.91	5.91	5.91	5.91	5.91	5.91	5.91	5.91	5.91	5.91	5.91	5.91	5.91	5.91	5.91	5.91
23	Belarus	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
24	Belize	6.69	6.69	6.69	6.69	6.69	6.69	6.69	6.69	6.69	6.69	6.69	6.69	6.69	6.69	6.69	6.69	6.68	6.68	6.68	6.68	6.68
25	Bolivia	6.48	6.48	6.48	6.48	6.48	6.48	6.48	6.48	6.48	6.48	6.48	6.48	6.48	6.48	6.48	6.48	6.48	6.48	6.48	6.48	6.48
26	Brazil	6.26	6.26	6.26	6.26	6.26	6.26	6.26	6.26	6.26	6.26	6.26	6.26	6.26	6.26	6.26	6.26	6.26	6.26	6.26	6.26	6.26
27	Barbados	4.96	4.93	4.9	4.87	4.84	4.82	4.79	4.76	4.73	4.7	4.68	4.65	4.62	4.59	4.56	4.53	4.51	4.48	4.45	4.51	4.51
28	Brunei	7.06	7.06	7.06	7.06	7.06	7.06	7.06	7.06	7.06	7.06	7.06	7.06	7.06	7.06	7.06	7.06	7.06	7.06	7.06	7.06	7.06
29	Bhutan	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67
30	Botswana	6.47	6.47	6.47	6.47	6.47	6.47	6.47	6.47	6.47	6.47	6.47	6.47	6.47	6.47	6.47	6.47	6.47	6.47	6.47	6.47	6.47
31	Central Afric	6.51	6.51	6.51	6.51	6.51	6.51	6.51	6.51	6.51	6.51	6.51	6.51	6.51	6.51	6.51	6.51	6.51	6.51	6.51	6.51	6.51
32	Canada	5.72	5.72	5.72	5.72	5.72	5.72	5.72	5.72	5.72	5.72	5.72	5.72	5.72	5.72	5.72	5.72	5.72	5.72	5.72	5.72	5.72
33	Channel Islar	5.07	5.07	5.07	5.07	5.07	5.07	5.07	5.07	5.07	5.07	5.07	5.07	5.07	5.07	5.07	5.07	5.07	5.07	5.07	5.07	5.07
34	Switzerland	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
35	Chile	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98
36	China	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
37	Cote d'Ivoire	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78
38	Cameroon	5.54	5.54	5.54	5.54	5.54	5.54	5.54	5.54	5.54	5.54	5.54	5.54	5.54	5.54	5.54	5.54	5.54	5.54	5.54	5.54	5.54

Babies per woman data from Gapminder <https://www.gapminder.org/data/>

Longer— R would like this

data_per_long — Saved to my Mac

Search (Cmd + Ctrl + U)

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Aptos Narrow (Bod... 12 A^ A^

B I U

General

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Format as Table

Cell Styles

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Delete

Format

Sort & Filter

Find & Select

Sensitivity

Add-ins

Analyze Data

A1

country

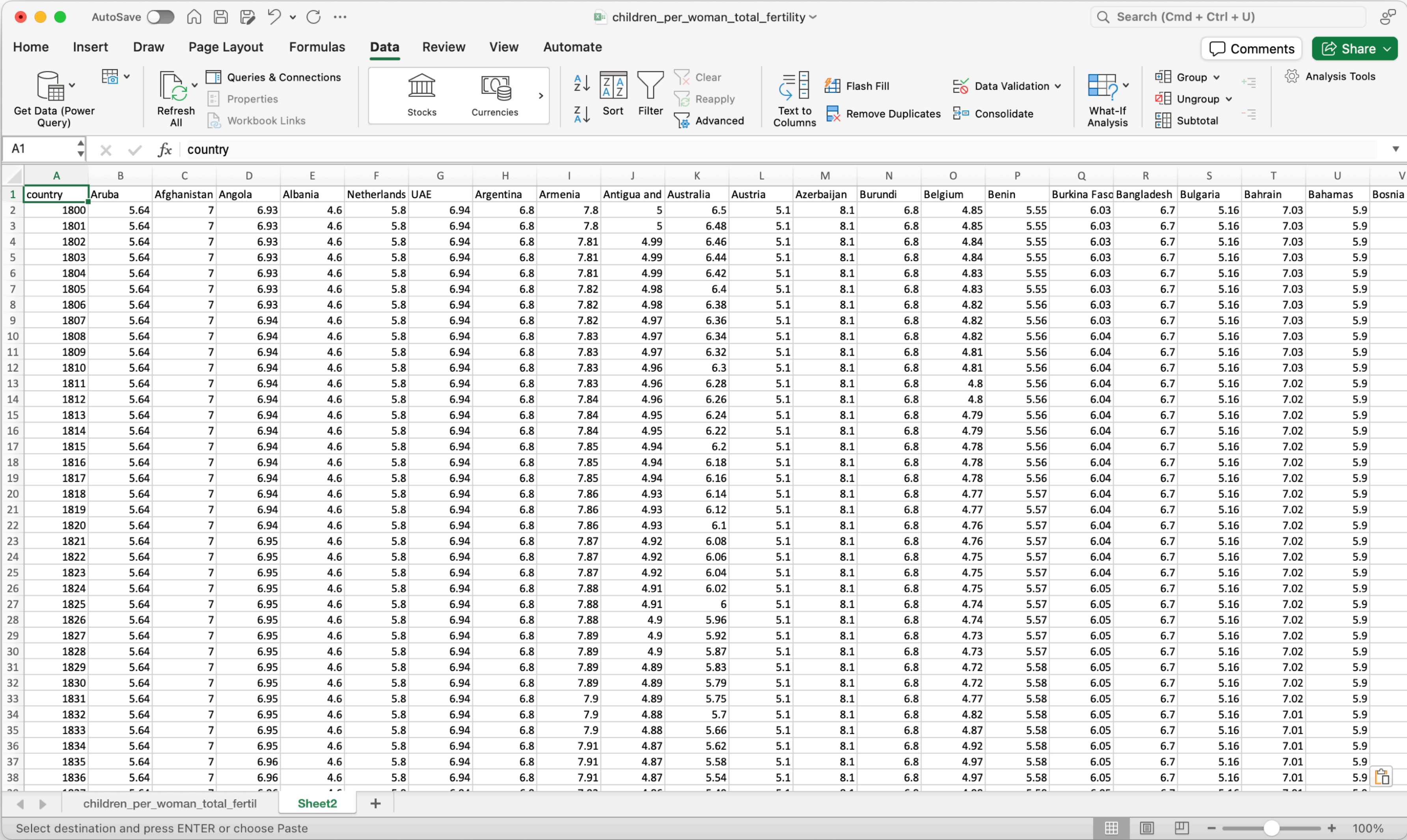
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	country	year	children_per																		
2	Aruba	1800	5.64																		
3	Aruba	1801	5.64																		
4	Aruba	1802	5.64																		
5	Aruba	1803	5.64																		
6	Aruba	1804	5.64																		
7	Aruba	1805	5.64																		
8	Aruba	1806	5.64																		
9	Aruba	1807	5.64																		
10	Aruba	1808	5.64																		
11	Aruba	1809	5.64																		
12	Aruba	1810	5.64																		
13	Aruba	1811	5.64																		
14	Aruba	1812	5.64																		
15	Aruba	1813	5.64																		
16	Aruba	1814	5.64																		
17	Aruba	1815	5.64																		
18	Aruba	1816	5.64																		
19	Aruba	1817	5.64																		
20	Aruba	1818	5.64																		
21	Aruba	1819	5.64																		
22	Aruba	1820	5.64																		
23	Aruba	1821	5.64																		
24	Aruba	1822	5.64																		
25	Aruba	1823	5.64																		
26	Aruba	1824	5.64																		
27	Aruba	1825	5.64																		
28	Aruba	1826	5.64																		
29	Aruba	1827	5.64																		
30	Aruba	1828	5.64																		
31	Aruba	1829	5.64																		
32	Aruba	1830	5.64																		
33	Aruba	1831	5.64																		
34	Aruba	1832	5.64																		
35	Aruba	1833	5.64																		
36	Aruba	1834	5.64																		
37	Aruba	1835	5.64																		

data_per_long

Ready Accessibility: Good to go

100%

Transposed— Datawrapper would like this



AutoSave

Home Insert Draw Page Layout

Get Data (Power Query) Refresh All

E19

	A	B	C
1	Country	2011	2012
2	FR	7000	6900
3	DE	5800	6000
4	US	15000	14000
5			
6			
7			
8			
9			
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11			
12			
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39			

Power Query Editor

Home Transform Add column View Help

Group by Table Use first row as headers Reverse rows Count rows

Replace values Any column

1 2

ABC 123 Data type: Text v

1 2 3

ABC 123 Detect data type

1 2 3

ABC 123 Rename

1 2 3

ABC 123 Pivot column

1 2 3

ABC 123 Unpivot columns v

1 2 3

ABC 123 Convert to list

1 2 3

ABC 123 Split column v

1 2 3

ABC 123 Format

1 2 3

ABC 123 Merge columns

1 2 3

ABC 123 Extract v

1 2 3

ABC 123 Parse v

1 2 3

ABC 123 Number column v

1 2 3

ABC 123 Date and time column v

Queries [2]

Sheet1

Sheet1 (2)

Table.UnpivotOtherColumns("#Changed column type 1", {"Country"}, "Attribute", "Value")

	Country	Attribute	Value
1	FR	2011	7000
2	FR	2012	6900
3	FR	2013	7000
4	DE	2011	5800
5	DE	2012	6000
6	DE	2013	6200
7	US	2011	15000
8	US	2012	14000
9	US	2013	13000

Query settings

Properties

Name

Sheet1 (2)

Applied steps

Source

Navigation 1

Changed column...

Promoted head...

Changed column...

Unpivoted colu...

Completed (0.27 s) Columns: 3 Rows: 9

Step

AutoSave

Home Insert Draw Page Layout

Get Data (Power Query) Refresh All

I18

	A	B	C
1	city	particle size	amount
2	New York	large	23
3	New York	small	14
4	London	large	22
5	London	small	16
6	Beijing	large	121
7	Beijing	small	56
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Power Query Editor

Home Transform Add column View Help

Group by, Use first row as headers, Transpose, Reverse rows, Count rows, Replace values, Detect data type, Mark as key, Rename, Pivot column, Unpivot columns, Convert to list, Fill, Move, Split column, Format, Merge columns, Extract, Parse, Number column, Date and time column

Queries [1] Sheet1

Table.Pivot(Table.TransformColumnTypes(#"Changed column type", {"particle size", type text}), List.

	A	B	C
1	Beijing	121	56
2	London	22	16
3	New York	23	14

Query settings

Properties

Name: Sheet1

Applied steps

- Source
- Navigation 1
- Promoted head...
- Changed colum...
- Pivoted column

Completed (0.28 s) Columns: 3 Rows: 3

Using GUIs in the classroom: pros and cons

Pros:

- Harder for students to use AI
- More direct manipulation

Cons:

- Harder to teach
- Not reproducible
- Less accessible

So... are GUIs the solution to AI?

Probably not