Intro to data visualization with Tableau

UBC Library Research Commons

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http://bit.ly/ubc-intro-data-viz

Pre-workshop setup

1. Install *Tableau Public* or *Tableau Desktop*
2. Download Labour Force Survey sample dataset
3. Create Tableau Public account (optional)

The Vancouver Campus is located on the traditional, ancestral, and unceded territory of the xʷməθkʷəy̓əm (Musqueam) people.

Map: https://native-land.ca/

Learning objectives

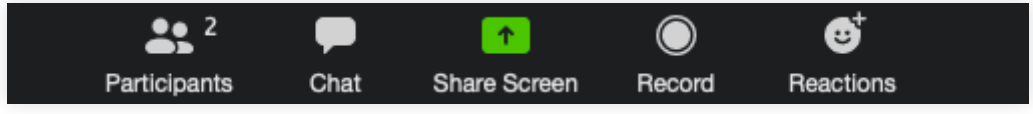
1. Recognize the characteristics of an effective visualization
2. Format data for visualization
3. Create a simple visualization using Tableau

Tableau Public

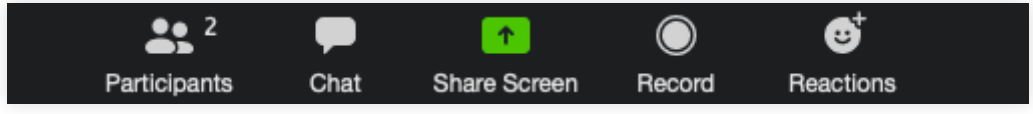
Limitations of the free version

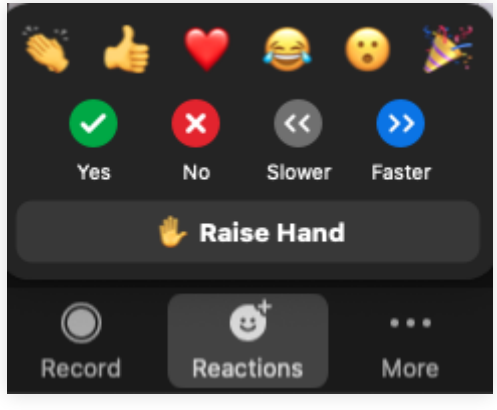
- Visualizations cannot be saved locally
- Dataset limit of 1M records
- Cannot connect databases

Participating online



Participating online





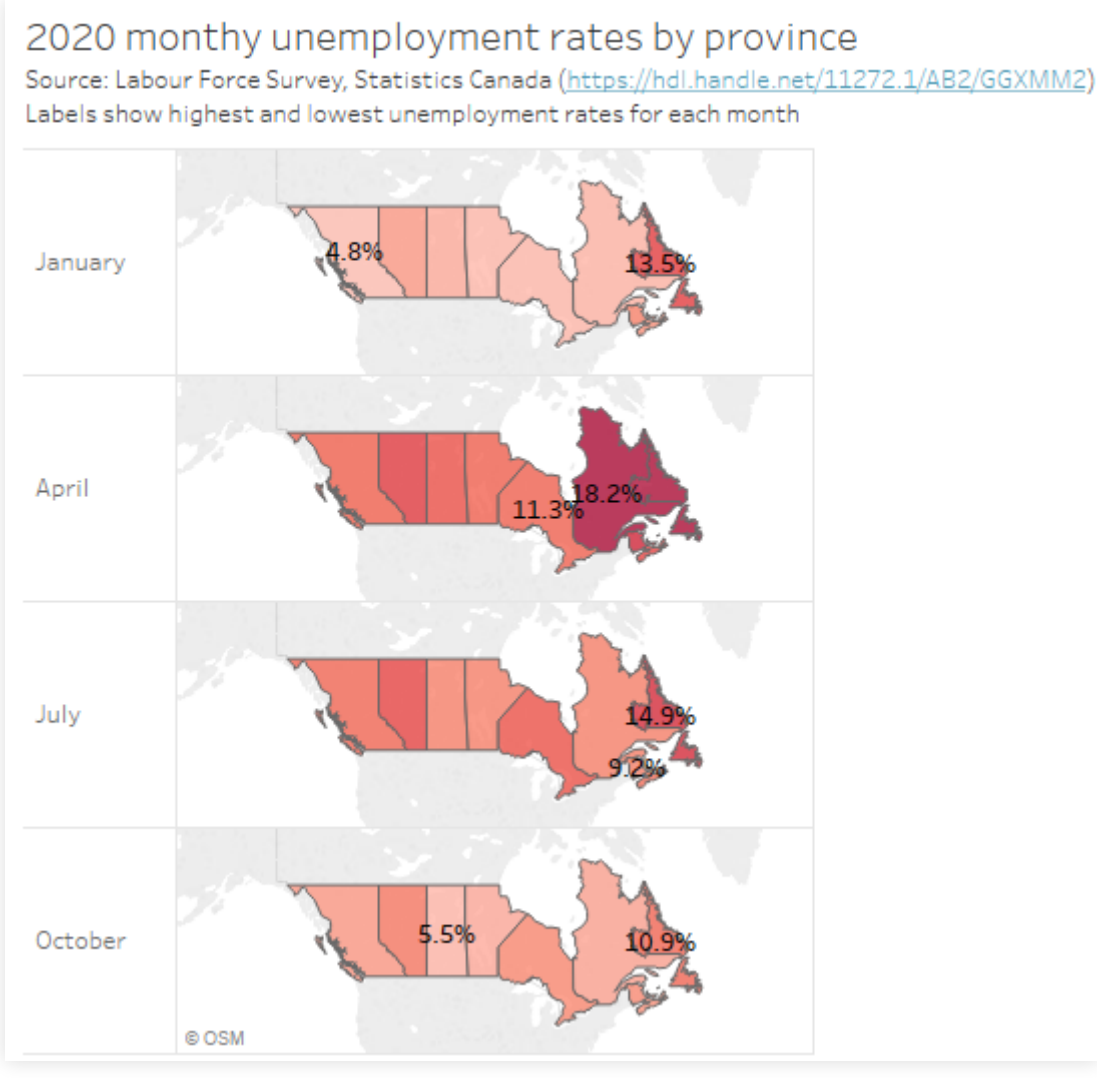
Outline

0:10	Visualization basics
0:25	Preparing your data
0:30	Introducing the Tableau interface
0:45	*Break*
0:50	Creating graphs
1:20	Saving your work

Source data

	A	B	C	D	E	F	G	H	I	J	K	
1	Record nu	Survey ye	Survey mo	Labour for	Province	Census m	Age group	Sex	Highest ed	Single or r	Class of w	Type
2	1	2020	January	Not in lab	Ontario	0	65-69	2	Postsecondary certificate or diplom			
3	2	2020	January	Employed	British Col	0	60-64	2	Above bac	Single job	private se	Part-
4	3	2020	January	Not in lab	British Col	9	70 and ove	1	0 to 8 years			
5	4	2020	January	Employed	Ontario	0	45-49	2	Bachelor's	Single job	public sec	Full-
6	5	2020	January	Employed	Quebec	0	35-39	2	Postsecon	Single job	private se	Full-
7	6	2020	January	Employed	Ontario	3	30-34	2	Bachelor's	Single job	private se	Full-
8	7	2020	January	Employed	Nova Scot	0	55-59	1	High scho	Single job	private se	Full-
9	8	2020	January	Not in lab	Quebec	0	65-69	2	High school graduate			
10	9	2020	January	Not in lab	British Col	9	65-69	2	High school graduate			
11	10	2020	January	Employed	Ontario	0	50-54	1	Postsecon	Single job	private se	Part-
12	11	2020	January	Not in lab	Nova Scot	0	65-69	1	Postsecondary certificate or diplom			
13	12	2020	January	Not in lab	Quebec	1	70 and ove	2	High school graduate			
14	13	2020	January	Employed	British Col	0	35-39	1	High scho	Single job	private se	Part-
15	14	2020	January	Employed	Saskatche	0	35-39	1	Postsecon	Single job	private se	Full-
16	15	2020	January	Not in lab	Newfound	0	15-19	1	Some high school			
17	16	2020	January	Not in lab	Manitoba	0	55-59	2	High school graduate			
18	17	2020	January	Not in lab	Newfound	0	55-59	1	0 to 8 years			
19	18	2020	January	Not in lab	Ontario	0	55-59	1	Postsecondary certificate or diplom			
20	19	2020	January	Employed	Saskatche	0	70 and ove	1	0 to 8 year	Single job	self-empl	Full-
21	20	2020	January	Not in lab	British Col	0	50-54	2	Some postsecondary			
22	21	2020	January	Employed	Manitoba	6	35-39	1	Bachelor's	Single job	self-empl	Full-

Sample map output



“Data visualization is the graphical display of abstract information for two purposes: sense-making (also called data analysis) and communication.”

-Stephen Few, What is Data Visualization

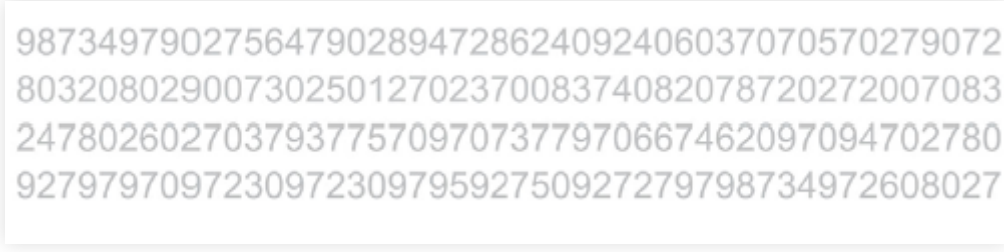
Preattentive processing

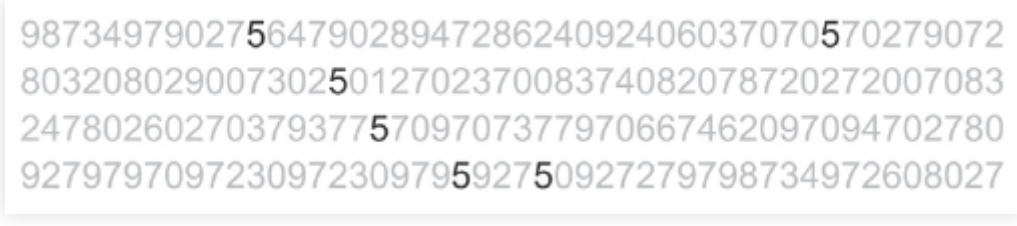
The eye and brain’s ability to process certain visual properties almost instantly, without conscious effort.

98734979027564790289472862409240603707057027907280320802900730250127023700837408207872027200708324780260270379377570970737797066746209709470278092797970972309723097959275092727979873497260802 7

98734979027564790289472862409240603707057027907280320802900730250127023700837408207872027200708324780260270379377570970737797066746209709470278092797970972309723097959275092727979873497260802 7

98734979027564790289472862409240603707057027907280320802900730250127023700837408207872027200708324780260270379377570970737797066746209709470278092797970972309723097959275092727979873497260802 7

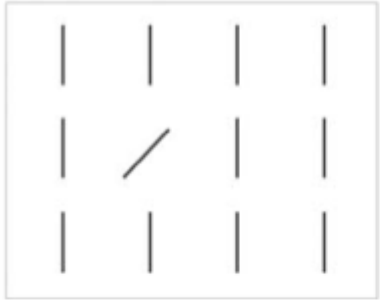




Figures on this and the next slide from Stephen Few, “Tapping the Power of Visual Perception”
http://www.perceptualedge.com/articles/ie/visual_perception.pdf

Form

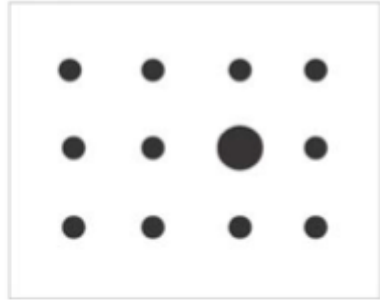
Orientation



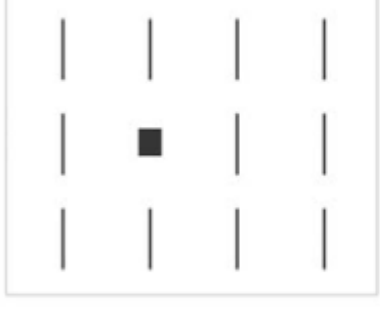
Line Length

Line Width

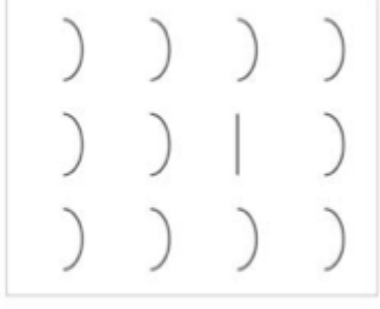
Size



Shape

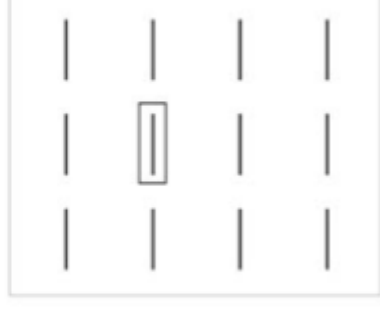


Curvature



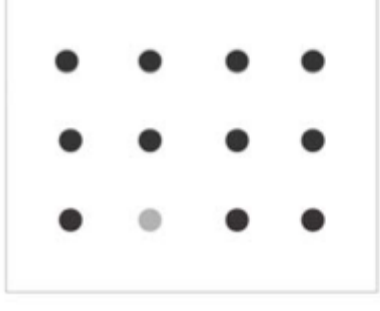
Added Marks

Enclusure

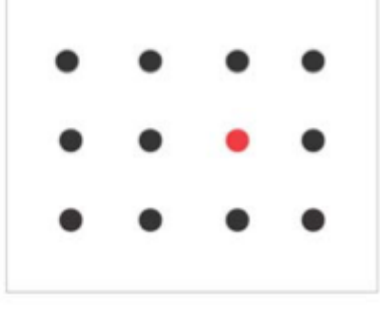


Color

Intensity

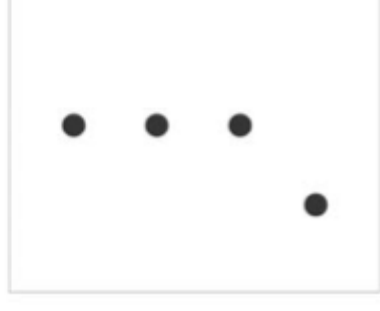


Hue



Spatial Position

2-D Position



Encoding quantities: length and size

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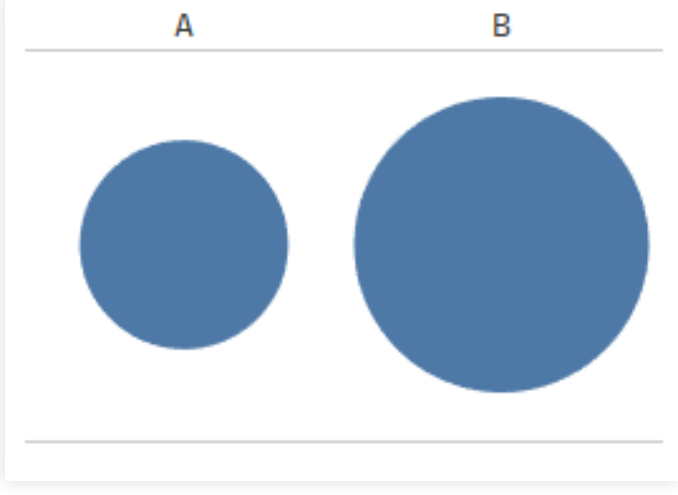

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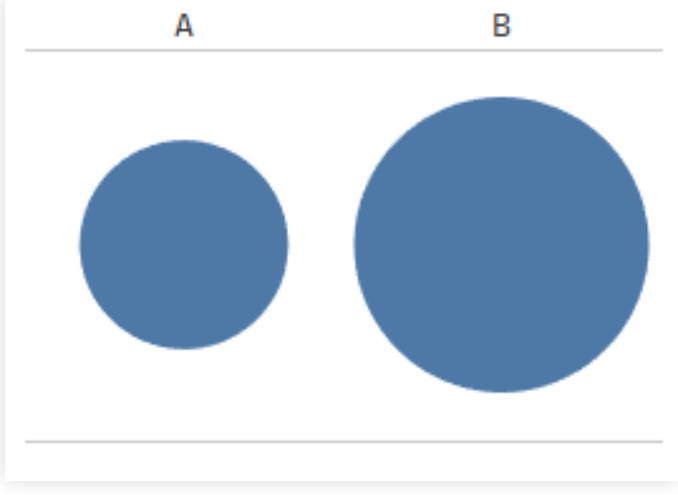

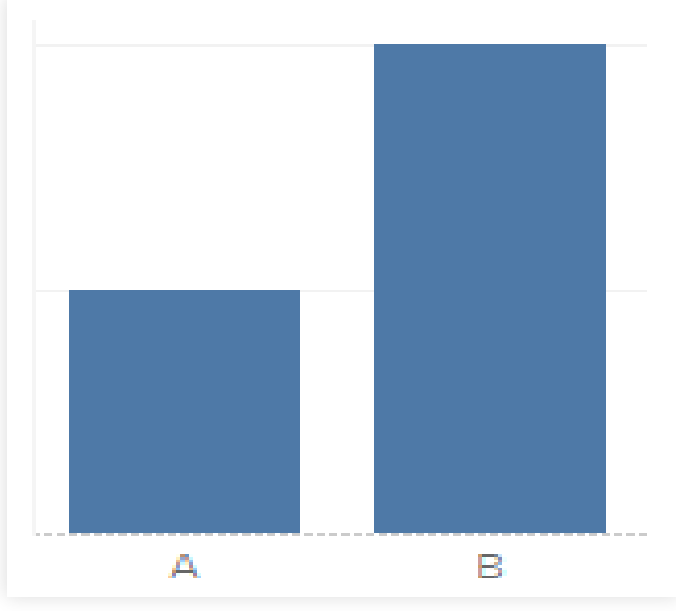

Remove unnecessary content to **focus** the viewer

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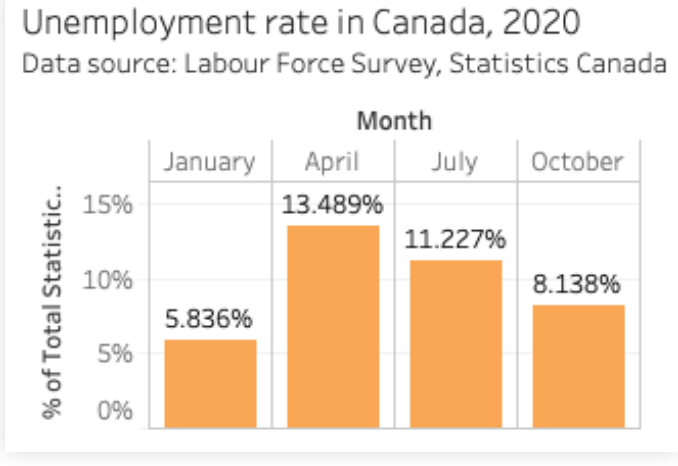

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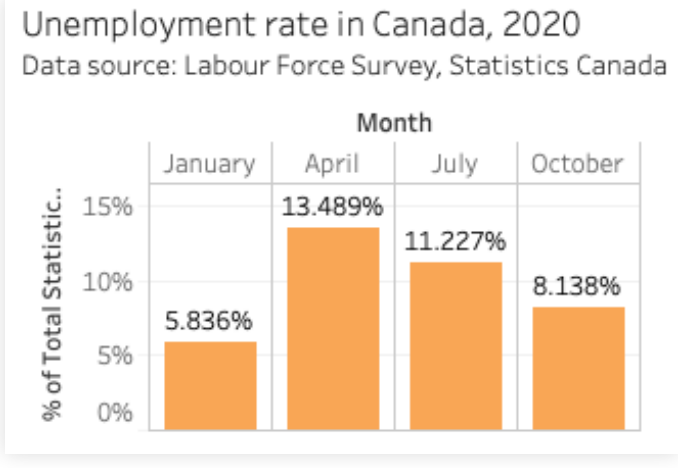

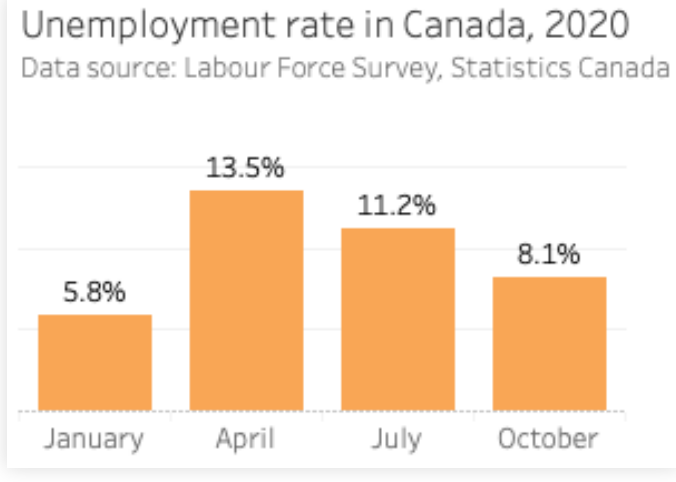

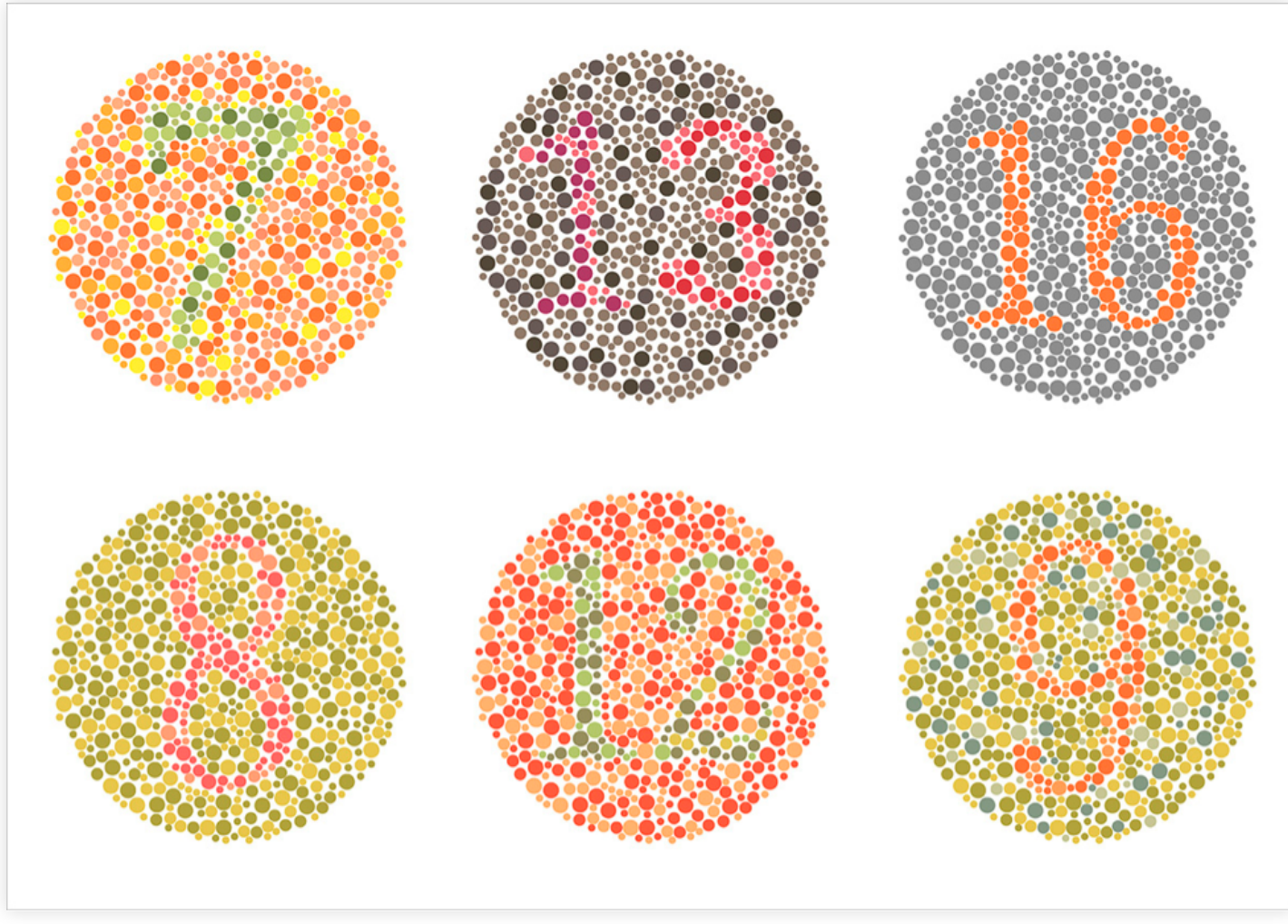

Source: Jeffrey Shaffer, https://www.tableau.com/about/blog/2016/4/examining-data-viz-rules-dont-use-red-green-together-53463

Use colors intentionally to **encode information**

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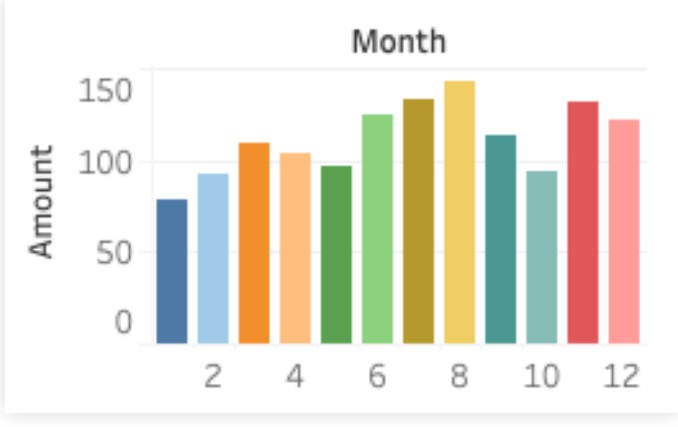

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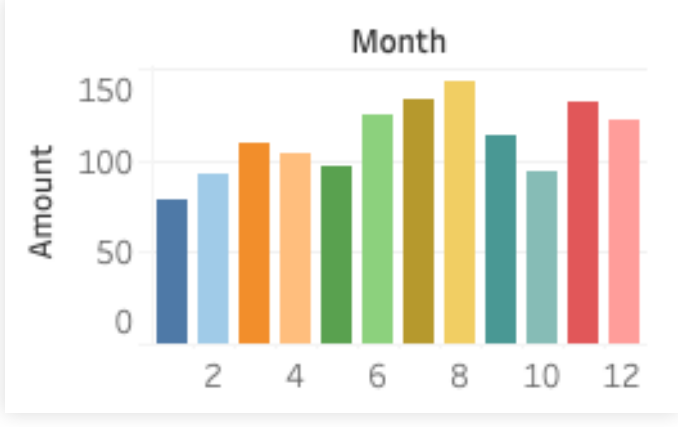
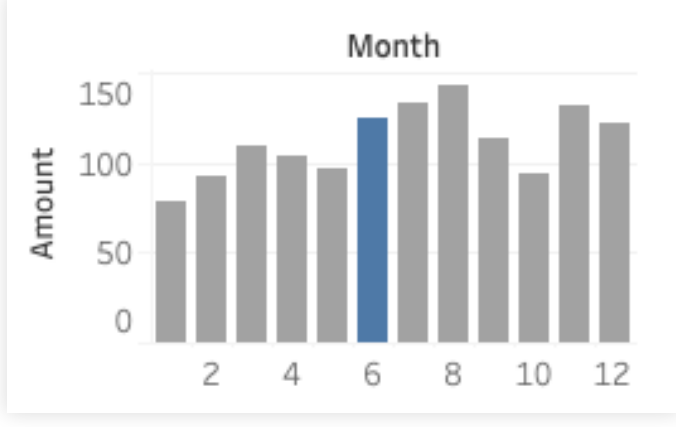




Some guiding principles

1. **Choose clarity over variety**
2. **Reduce burden on the reader**
3. **Present data with integrity**

Preparing your data

Each measure in one column

	A	B	C	D	E	F
1		**march**	**april**	**may**	**june**	**july**
2	kittens_adopted	0	0	1	0	2
3	meals_ordered	8	11	17	13	23

Each measure in one column

	A	B	C	D	E	F
1		**march**	**april**	**may**	**june**	**july**
2	kittens_adopted	0	0	1	0	2
3	meals_ordered	8	11	17	13	23

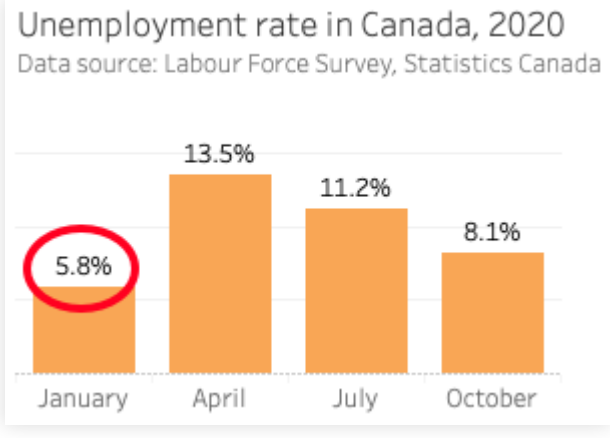
	A	B	C
1	**month**	**kittens_adopted**	**meals_ordered**
2	march	0	8
3	april	0	11
4	may	1	17
5	june	0	13
6	july	2	23

Know your dataset

Know your dataset

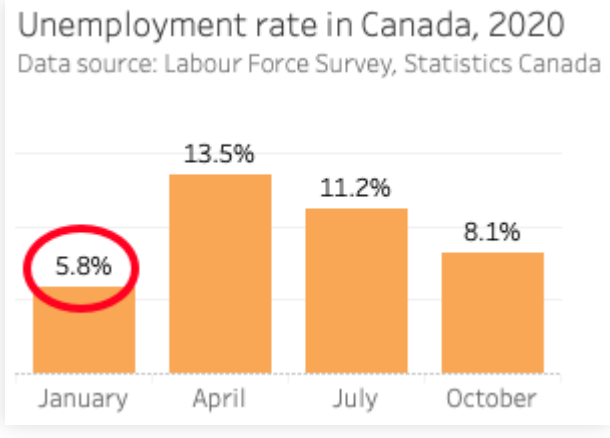
- How is it formatted?
- How many records are there?
- What are the variable labels?
- Is there a user guide or data dictionary?

Checking your work



Statistics Canada table 14-10-0017-02, Labour force characteristics by province, monthly, unadjusted for seasonality.

Checking your work



Geography[2]	Labour force characteristics	January 2018	January 2019	January 2020	Ja 2(Ja
				Percentage	
Canada(map)	Unemployment rate[3]	6.2	6.2	5.8	

Statistics Canada table 14-10-0017-02, Labour force characteristics by province, monthly, unadjusted for seasonality.

Hands-on practice