

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 x^wməθk^wəyəm (Musqueam) people.

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

Learning objectives

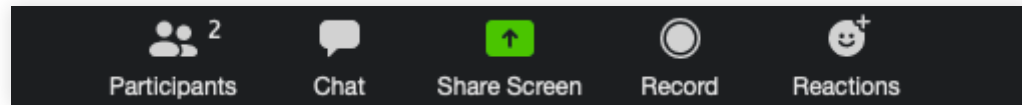
1. Recognize the characteristics of an effective visualization
2. Format data for visualization
3. Create a simple visualization using Tableau

Tableau Public

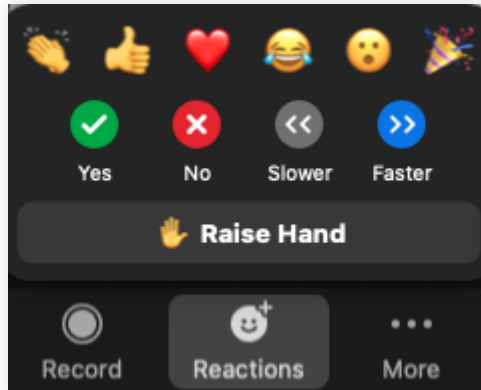
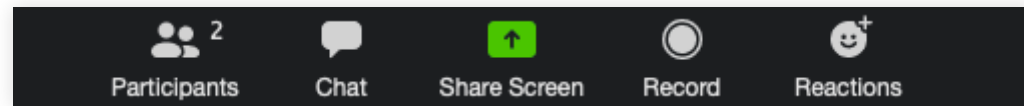
Limitations of the free version

- 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

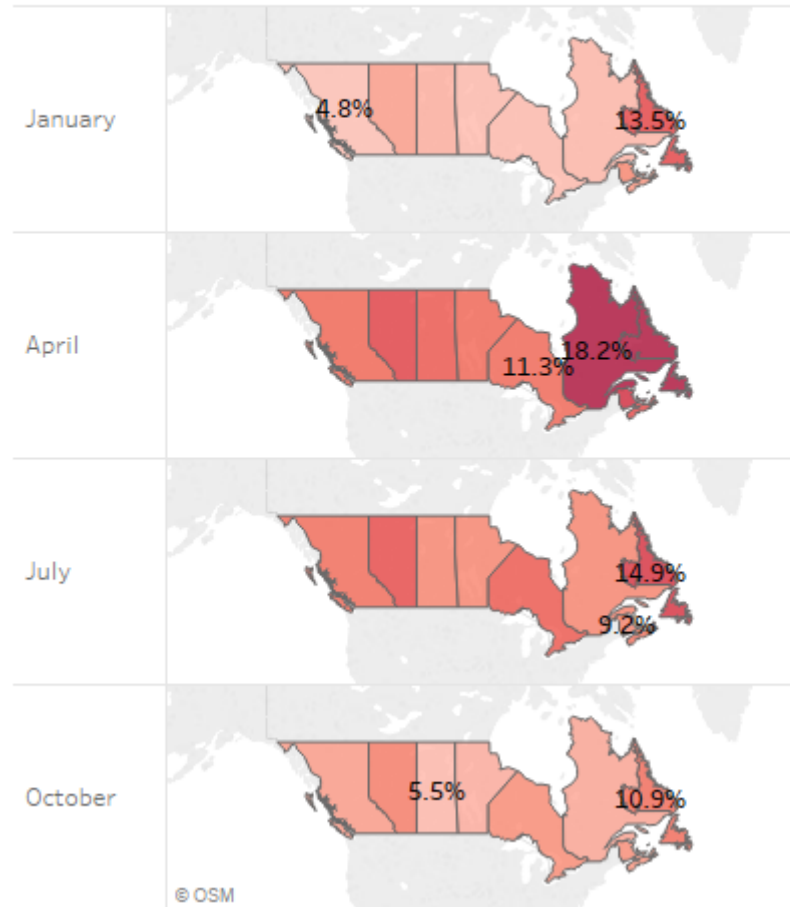
	A	B	C	D	E	F	G	H	I	J	K	
1	Record nu	Survey ye	Survey mo	Labour for	Province	Census m	Age group	Sex	Highest e	Single or r	Class of w	Type
2	1	2020	January	Not in lab	Ontario	0	65-69		2	Postsecondary certificate or diplom		
3	2	2020	January	Employed	British Col	0	60-64		2	Above bac	Single job private se	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

2020 monthly unemployment rates by province

Source: Labour Force Survey, Statistics Canada (<https://hdl.handle.net/11272.1/AB2/GGXMM2>)

Labels show highest and lowest unemployment rates for each month



“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.

987349790275647902894728624092406037070570279072
803208029007302501270237008374082078720272007083
247802602703793775709707377970667462097094702780
927979709723097230979592750927279798734972608027

987349790275647902894728624092406037070570279072
803208029007302501270237008374082078720272007083
247802602703793775709707377970667462097094702780
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98734979027**5**647902894728624092406037070**5**70279072
803208029007302**5**01270237008374082078720272007083
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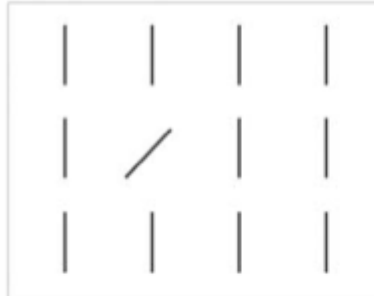
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927979709723097230979**5**927**5**0927279798734972608027

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



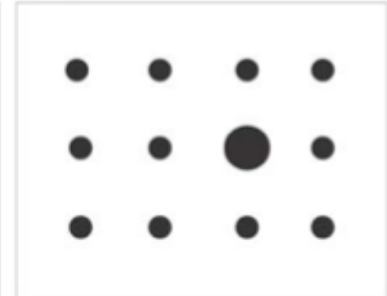
Line Length



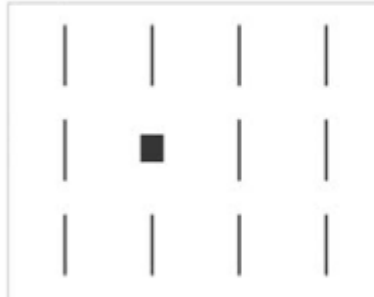
Line Width



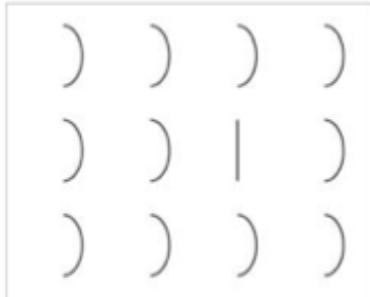
Size



Shape



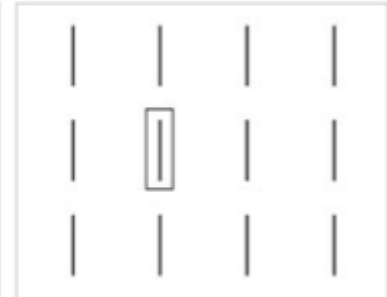
Curvature



Added Marks

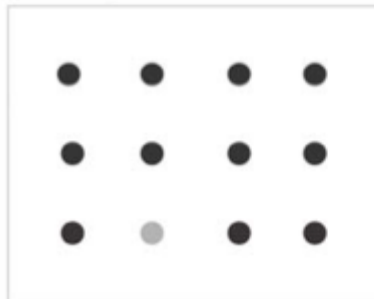


Enclosure

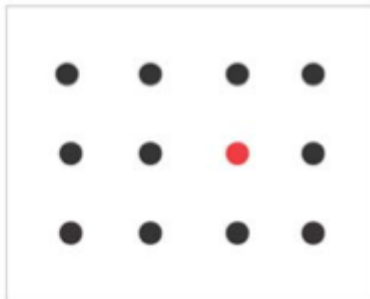


Color

Intensity



Hue



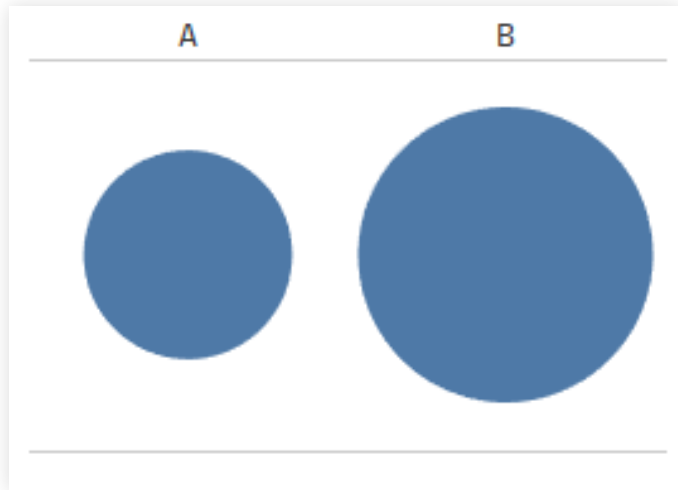
Spatial Position

2-D Position

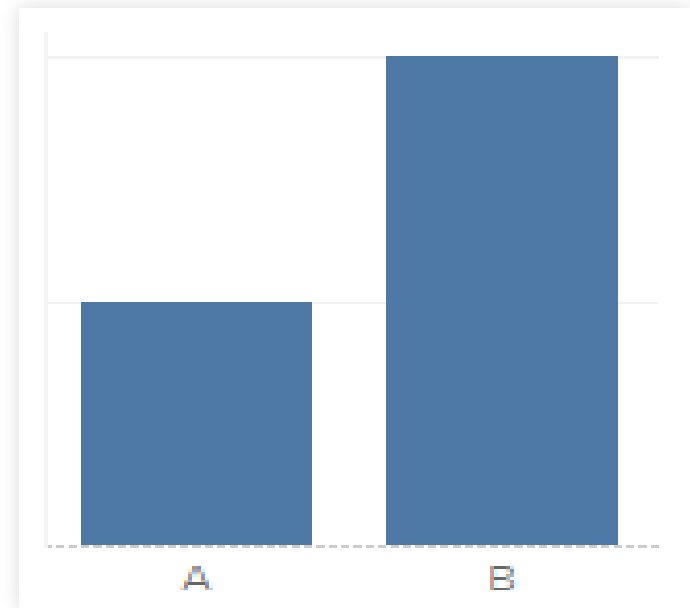
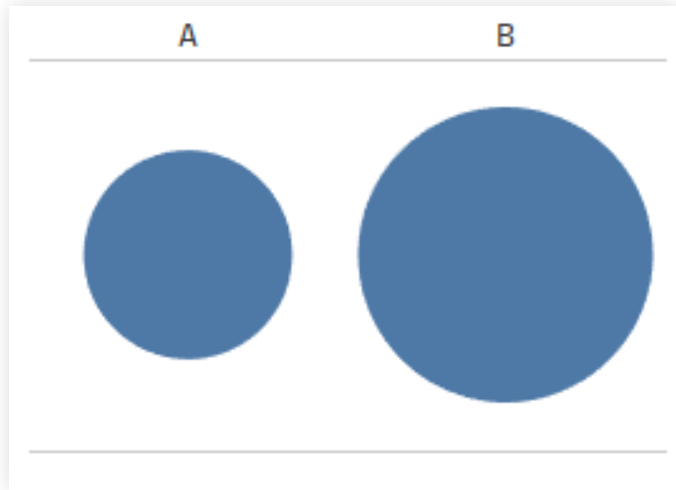


Encoding quantities: length and size

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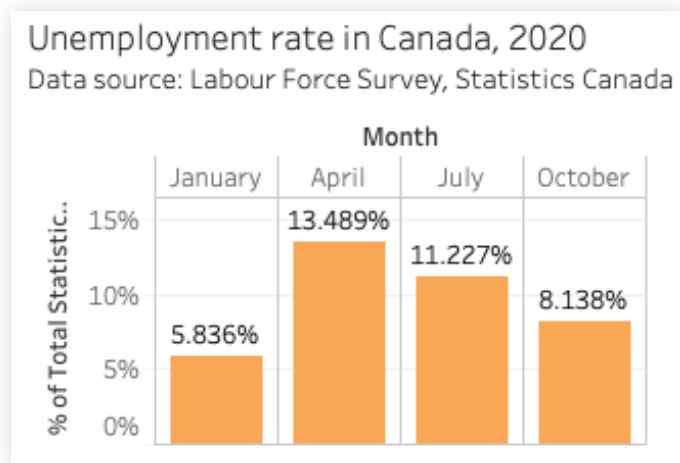


Encoding quantities: length and size



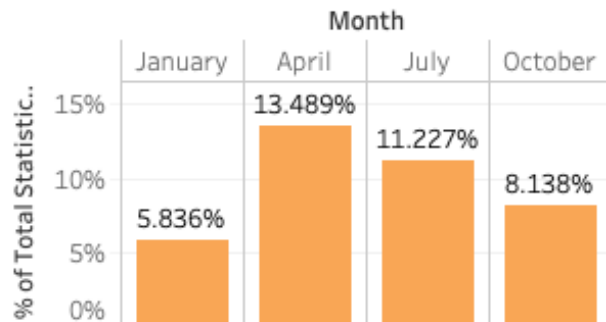
Remove unnecessary content to **focus** the viewer

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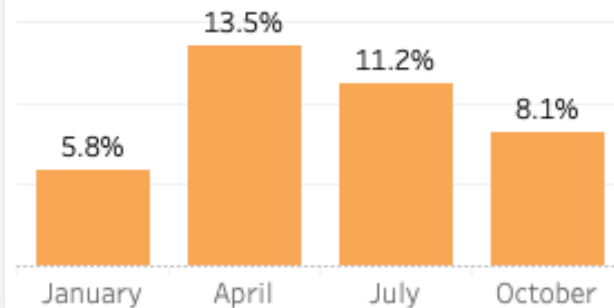


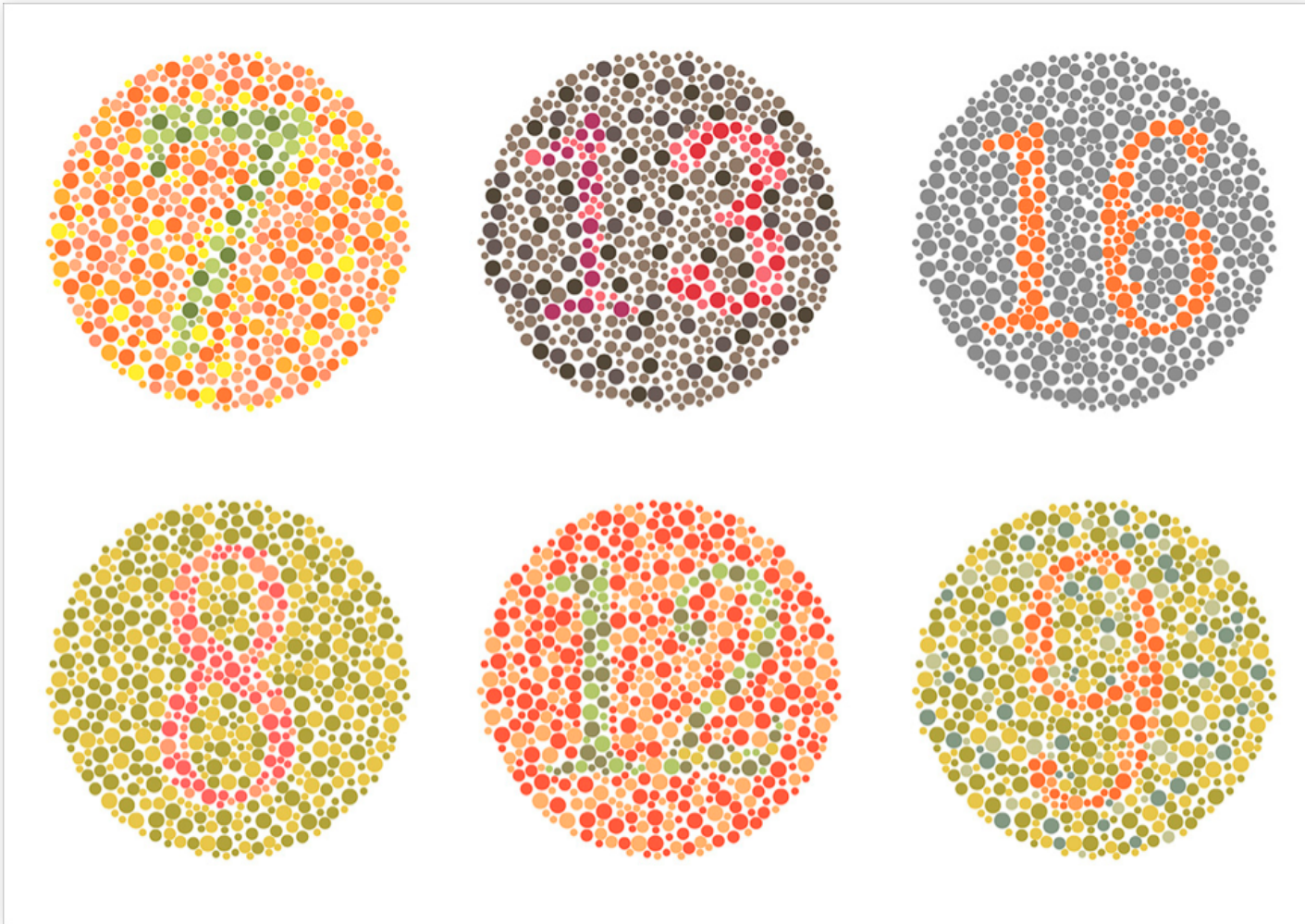
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Unemployment rate in Canada, 2020
Data source: Labour Force Survey, Statistics Canada



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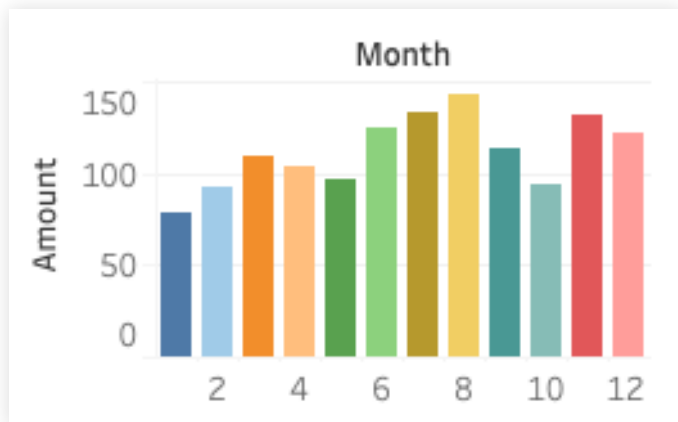




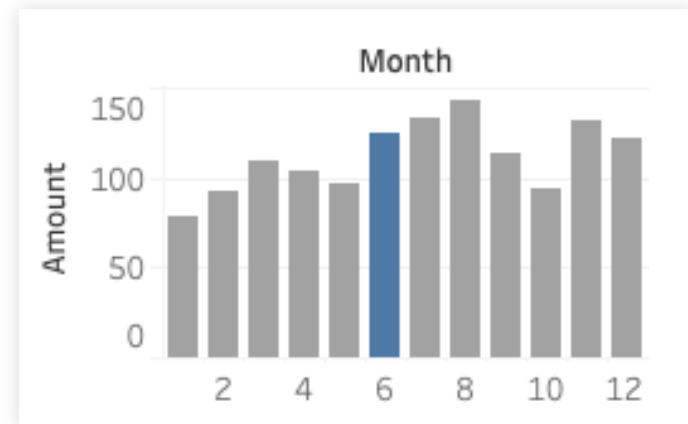
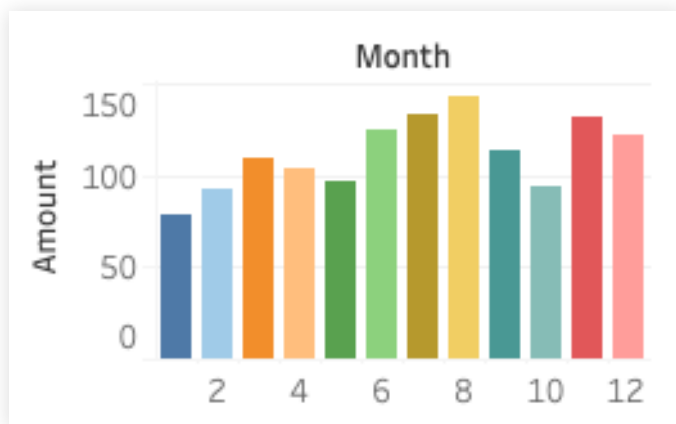
Source: Jeffrey Shaffer, <https://www.tableau.com/about/blog/2016/4/examining-data-viz-rules-dont-use-red-green-together-53463>

Use colors intentionally to **encode information**

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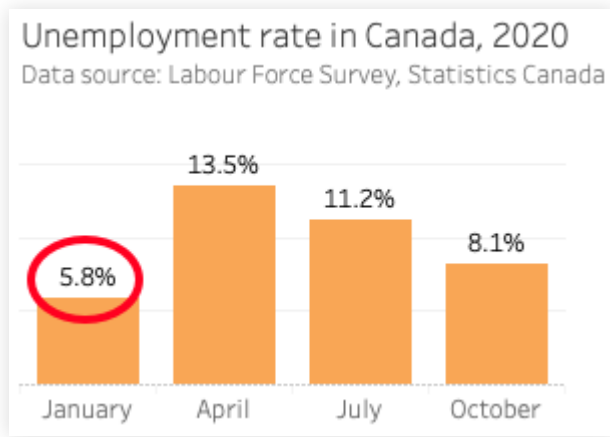
	A	B	C
1	month	kittens_adopted	meals_ordered
2	march	0	8
3	april	0	11
4	may	1	17
5	june	0	13
6	july	2	23

Know your dataset

Know your dataset

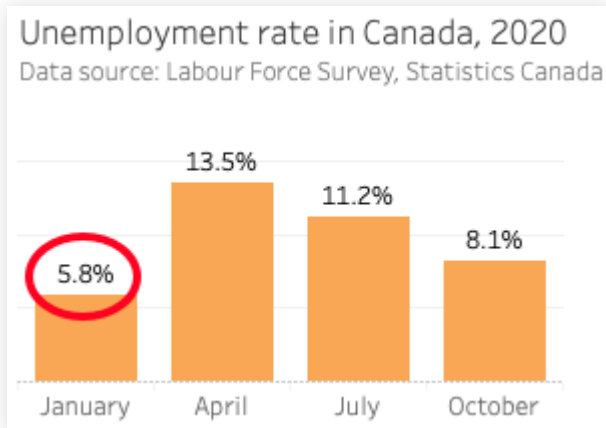
- How is it formatted?
- How many records are there?
- What are the variable labels?
- Is there a user guide or data dictionary?

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	January 2021
Canada(map)		Percentage			
	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

