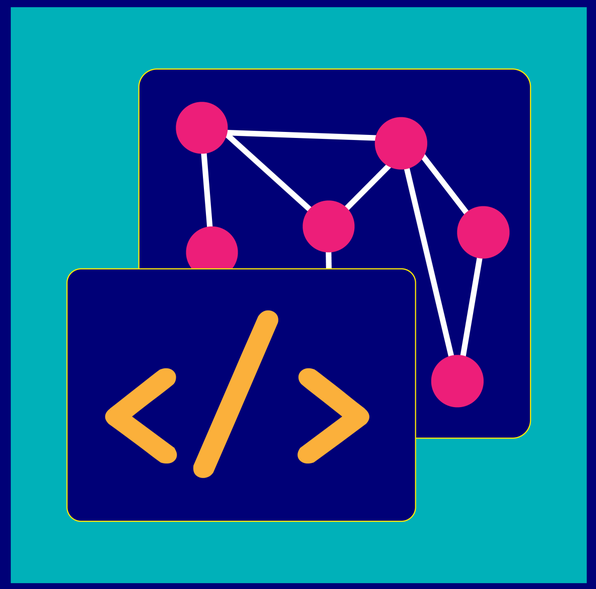


Analysis and Visualisation with NetworkX and Altair

Week 2: Altair

11 December 2020

CDCS Python Libraries Series

with Lucy Havens

Course Topics

Week 1: Network Analysis

Week 2: Data Visualisation

Data Visualization: A Recap

Visually encoding data with:

- Shape
- Color
- Position
- Texture or pattern

Static, dynamic, or interactive

Data Visualization: A Recap

Data can be:

- Continuous
- Discrete
- Nominal
- Ordinal
- Categorical

Working with Data: A Recap

Data are summaries.

Data reflect power distributions in society.

Data about people represent only a select characteristic or set of characteristics about people. A person cannot be fully known through their data.

Assignment

Watch a video by Hans Rosling, one of the creators of Gapminder and the author of Factfulness

Pick a chart from Our World In Data and answer questions about how it visually encodes information

Create your own charts in Altair

You can start from the Notebook demoed today!

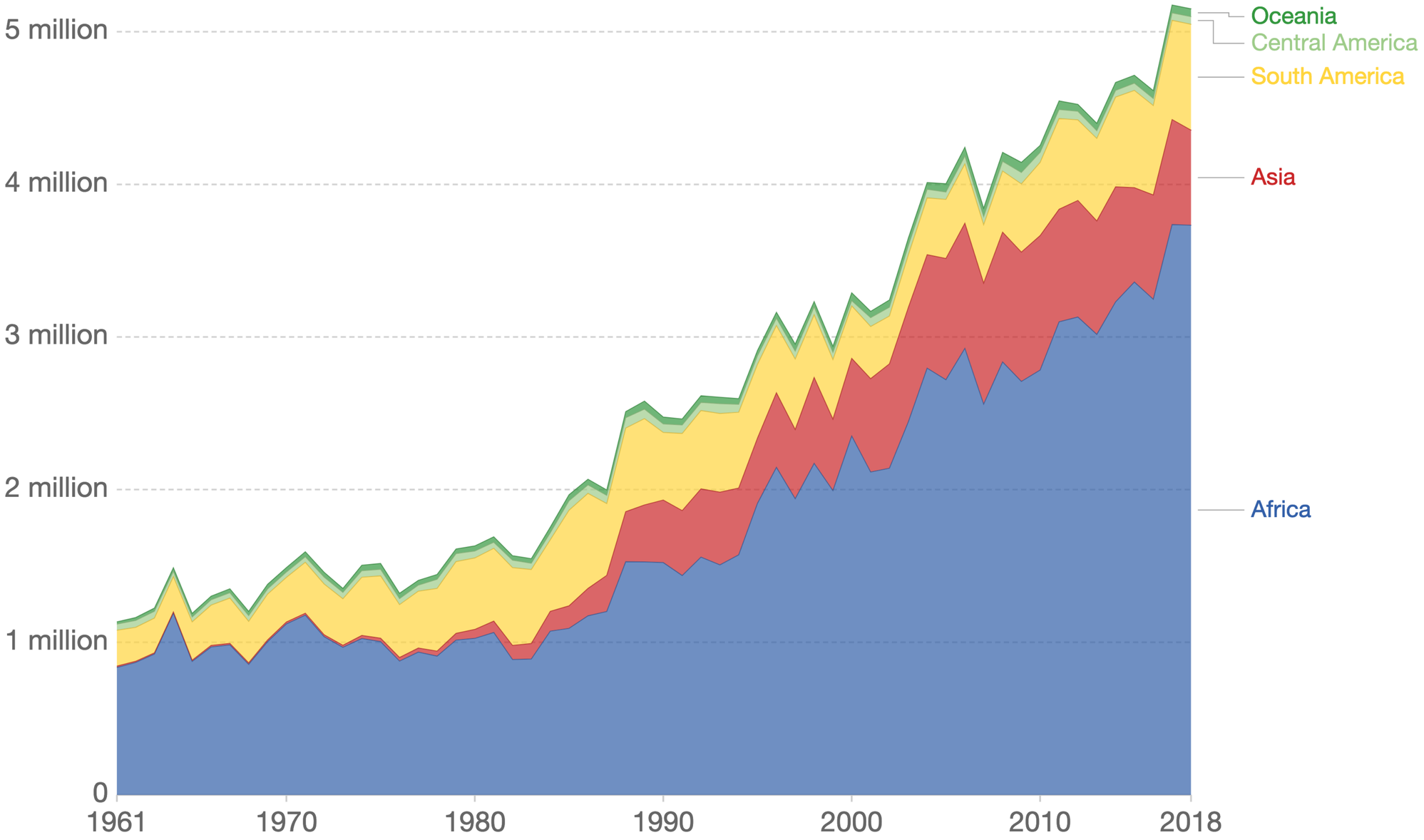
How did it go?

SHARE BACK

Cocoa beans production, 1961 to 2018

Global production of cocoa beans, measured in tonnes of production per year.

Our World in Data



Source: UN Food and Agriculture Organization (FAO)

Reference: ourworldindata.org/grapher/cocoa-beans-production-by-region

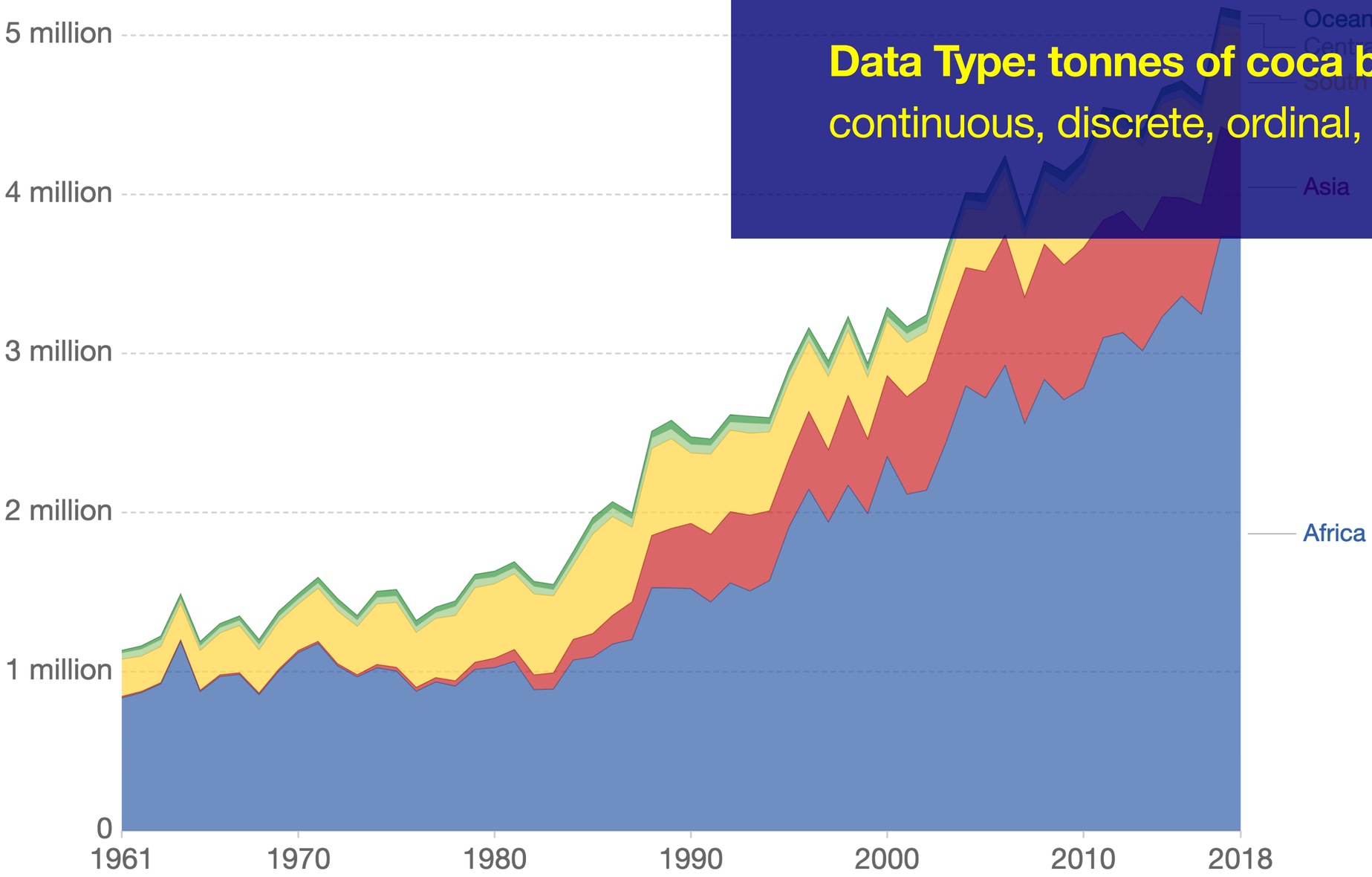
Cocoa beans production, 1961 to 2018

Global production of cocoa beans, measured in tonnes of production per year.

Our World in Data

Data Type: tonnes of coca beans

continuous, discrete, ordinal, nominal, or categorical?



Source: UN Food and Agriculture Organization (FAO)

Reference: ourworldindata.org/grapher/cocoa-beans-production-by-region

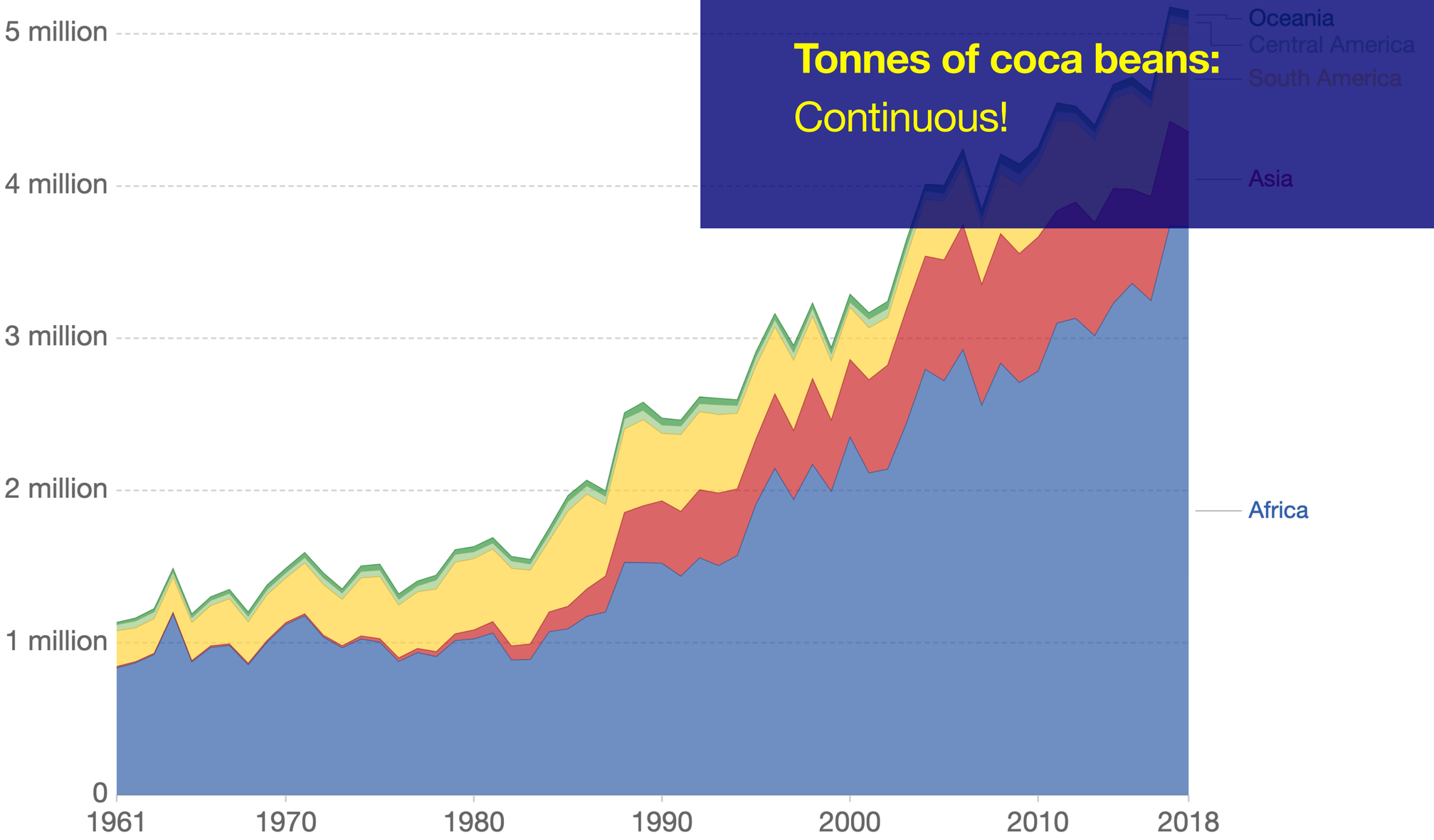
Cocoa beans production, 1961 to 2018

Global production of cocoa beans, measured in tonnes of production per year.

Our World in Data

Tonnes of coca beans:

Continuous!



Source: UN Food and Agriculture Organization (FAO)

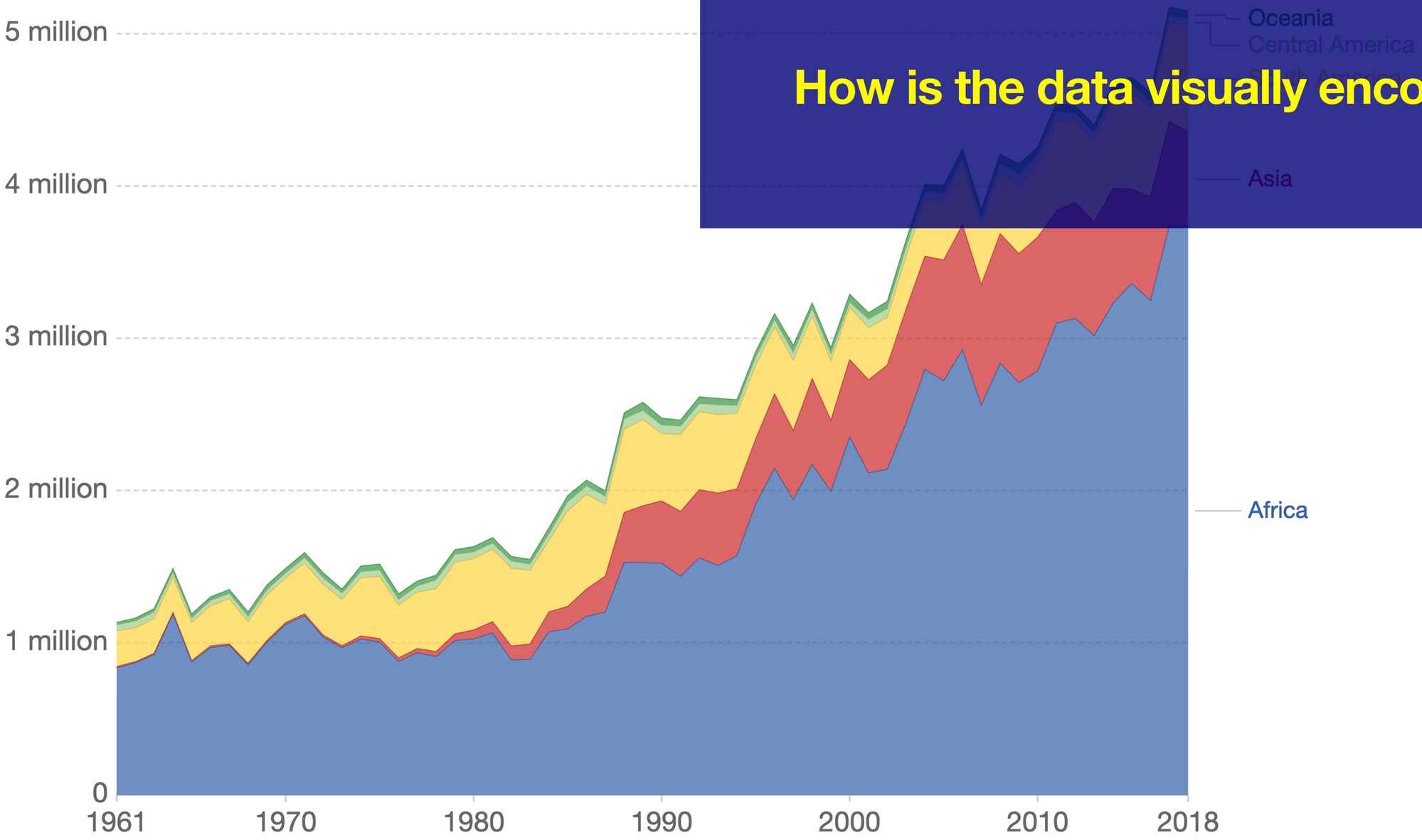
Reference: ourworldindata.org/grapher/cocoa-beans-production-by-region

Cocoa beans production, 1961 to 2018

Global production of cocoa beans, measured in tonnes of production per year.

Our World in Data

How is the data visually encoded?



Source: UN Food and Agriculture Organization (FAO)

Reference: ourworldindata.org/grapher/cocoa-beans-production-by-region

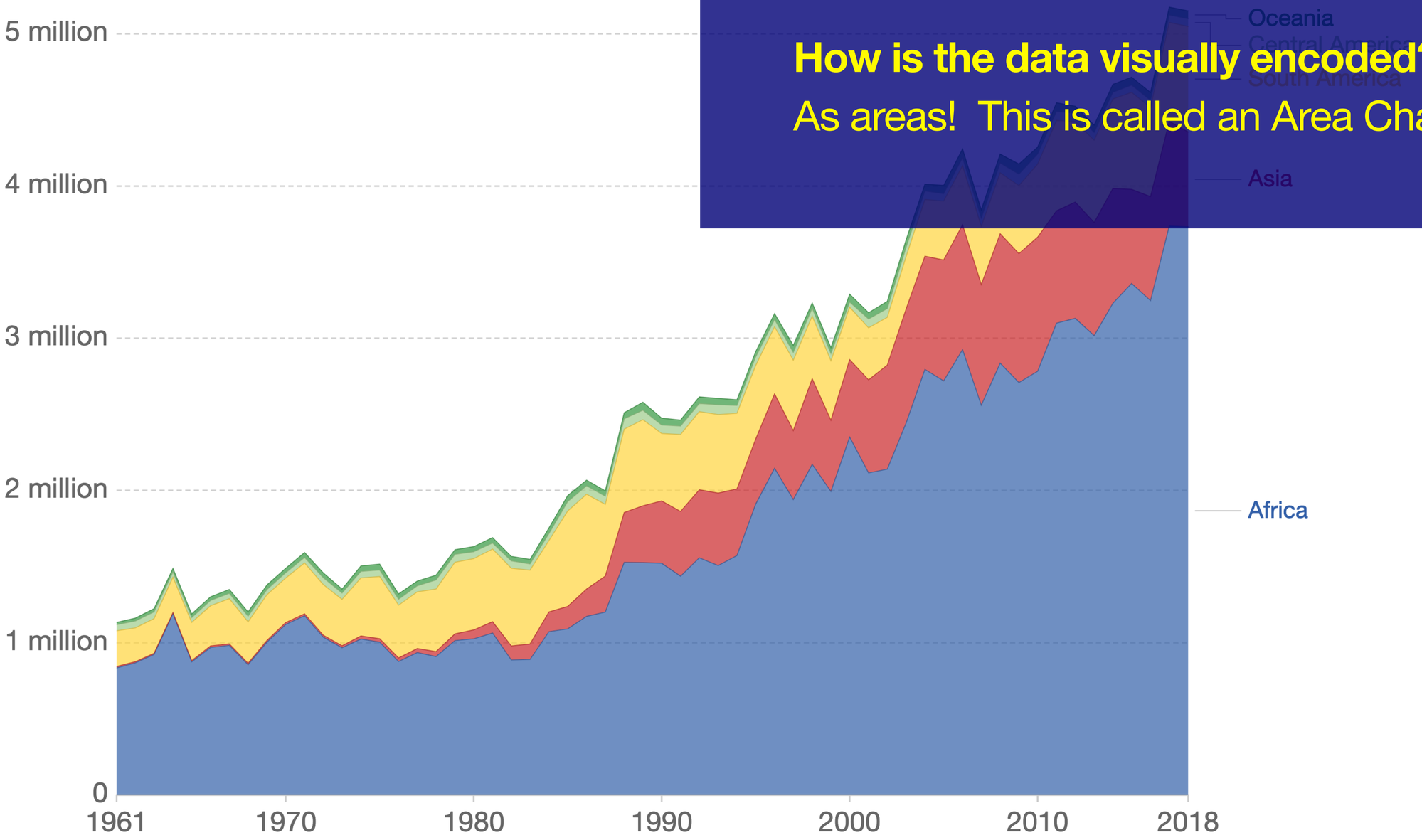
Cocoa beans production, 1961 to 2018

Global production of cocoa beans, measured in tonnes of production per year.

Our World in Data

How is the data visually encoded?

As areas! This is called an Area Chart.



Source: UN Food and Agriculture Organization (FAO)

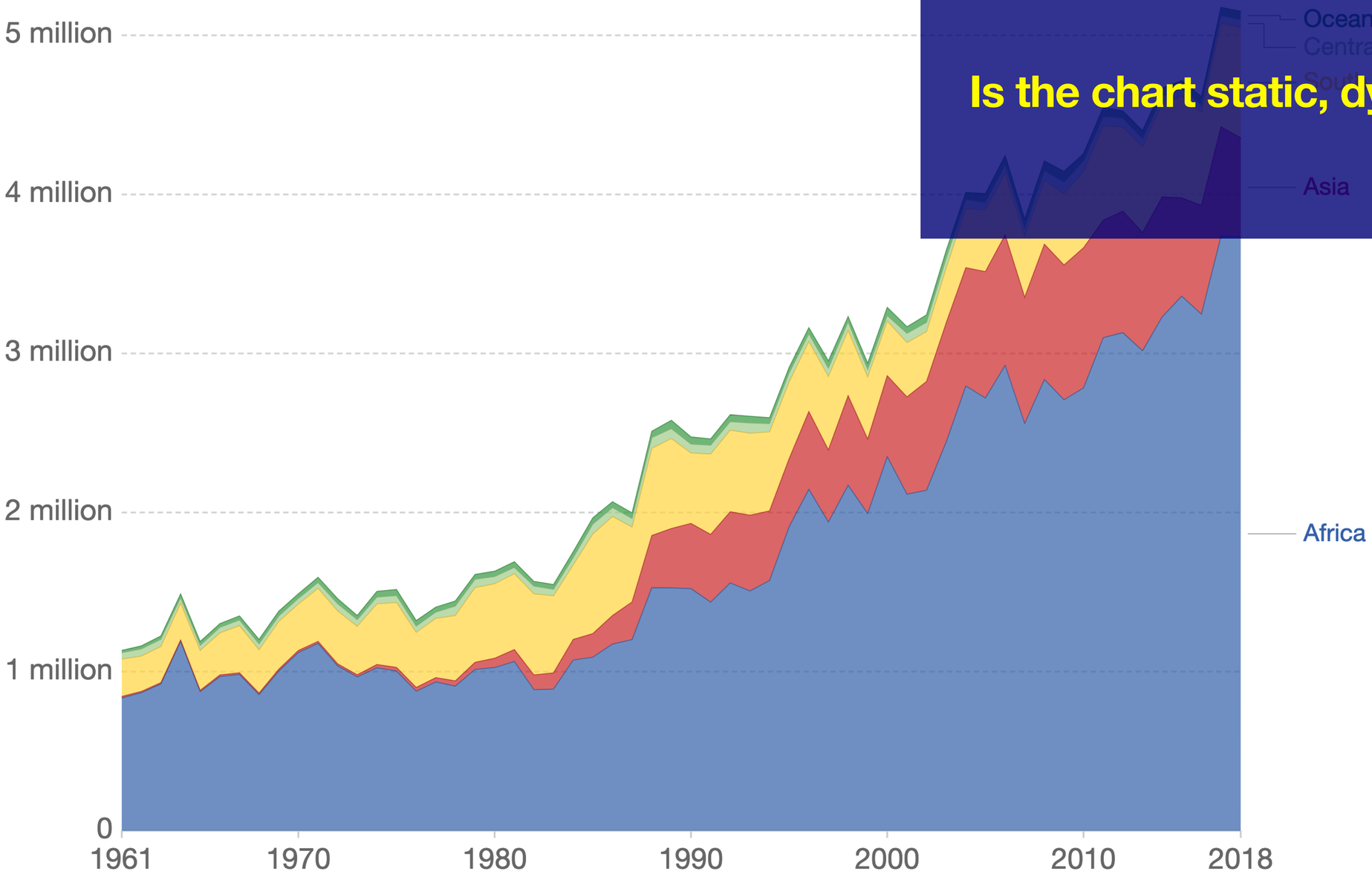
Reference: ourworldindata.org/grapher/cocoa-beans-production-by-region

Cocoa beans production, 1961 to 2018

Global production of cocoa beans, measured in tonnes of production per year.

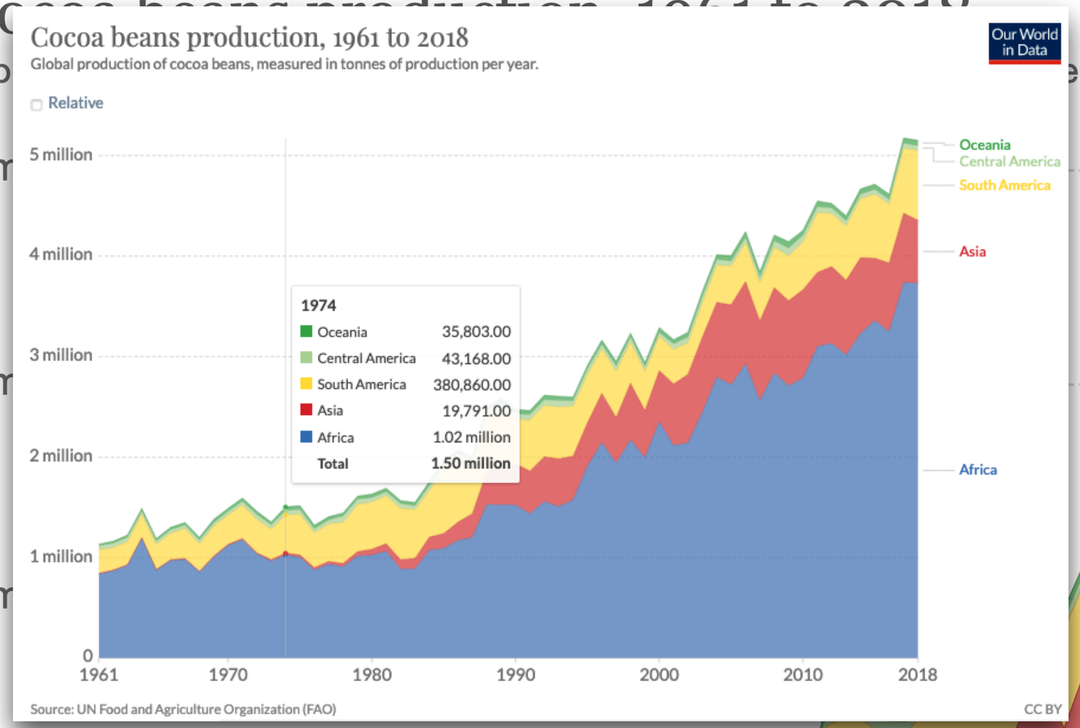
Our World in Data

Is the chart static, dynamic, or interactive?



Source: UN Food and Agriculture Organization (FAO)

Reference: ourworldindata.org/grapher/cocoa-beans-production-by-region

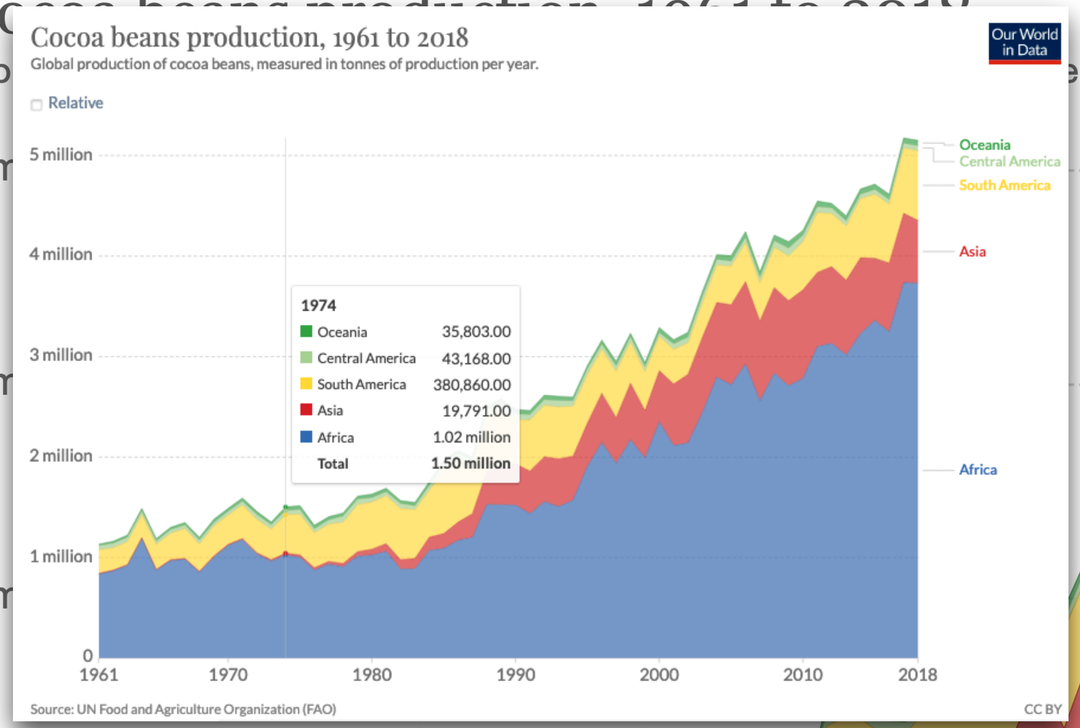


Our World in Data

Is the chart static, dynamic, or interactive?

Dynamic and interactive!

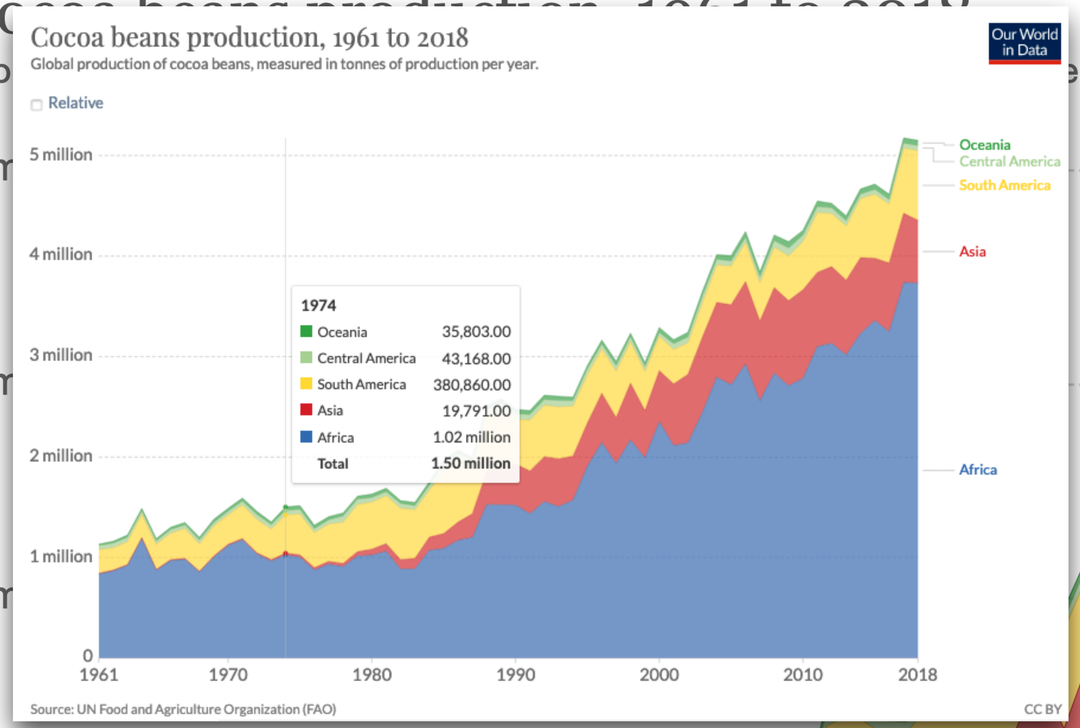
Reference: ourworldindata.org/grapher/cocoa-beans-production-by-region



Our World in Data

What changes in the chart when you interact with it?

Reference: ourworldindata.org/grapher/cocoa-beans-production-by-region



Our World in Data

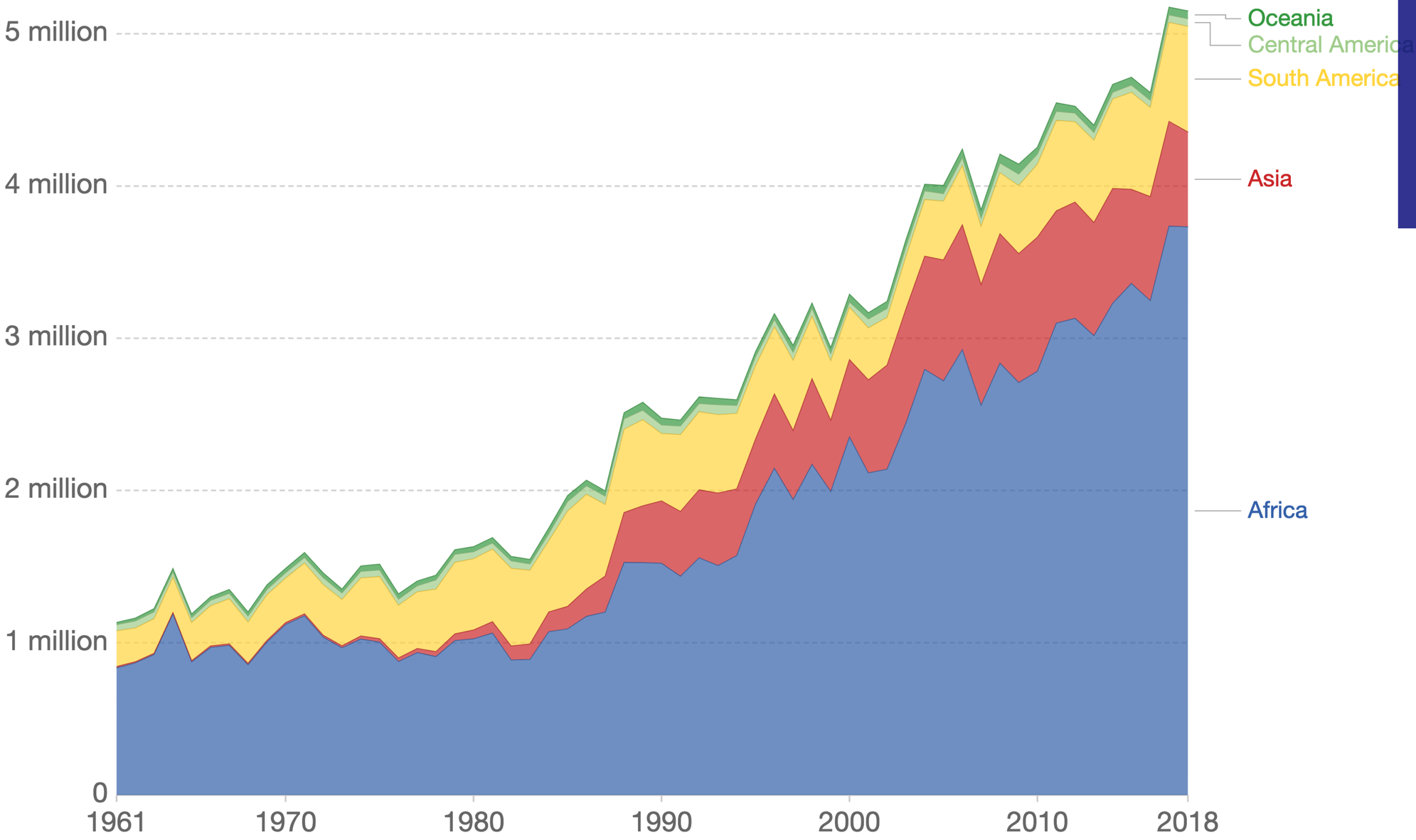
A tooltip appears!

Reference: ourworldindata.org/grapher/cocoa-beans-production-by-region

Cocoa beans production, 1961 to 2018

Global production of cocoa beans, measured in tonnes of production per year.

Our World in Data



Source: UN Food and Agriculture Organization (FAO)

What does the chart tell you?

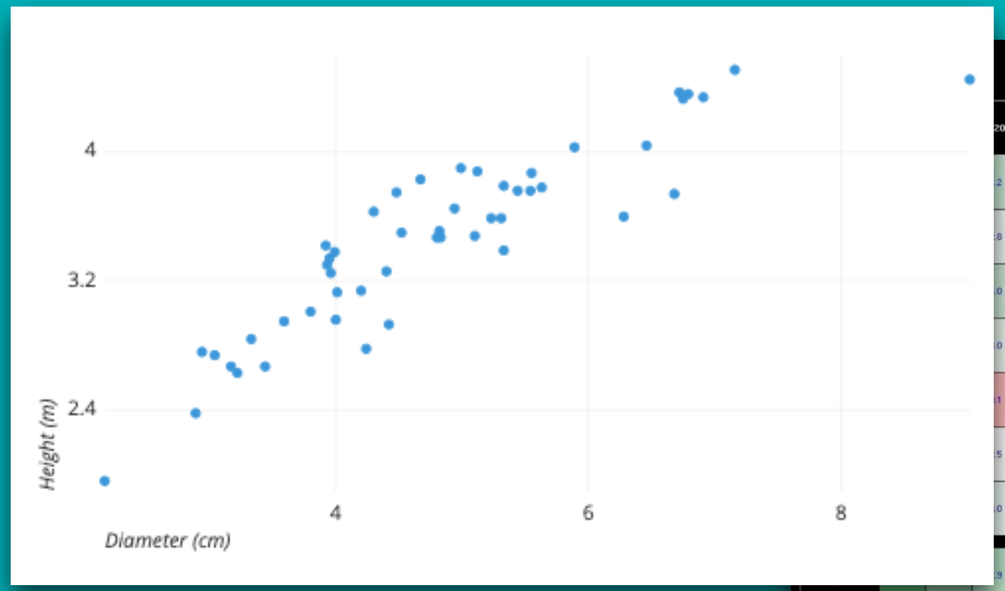
Reference: ourworldindata.org/grapher/cocoa-beans-production-by-region

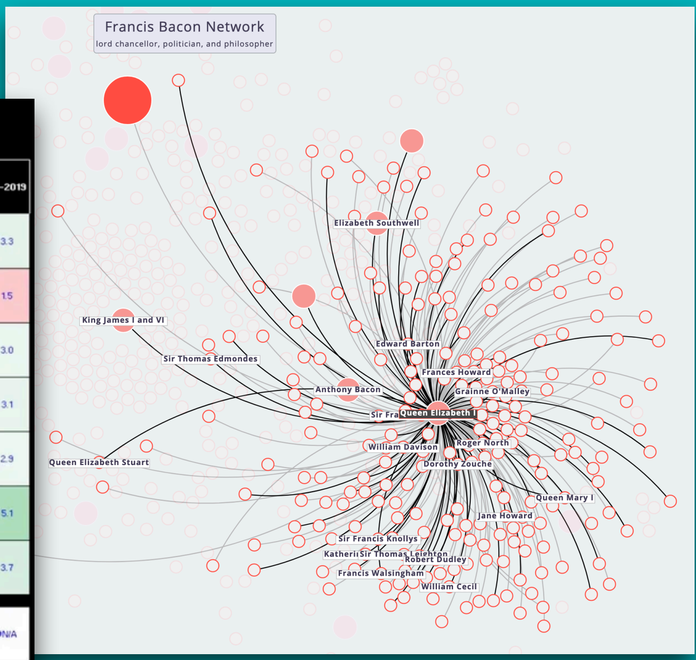
How to Choose the Visualization for Your Data

Reference: https://towardsdatascience.com/data-visualization-how-to-choose-the-right-chart-part-1-d4c550085ea7

Do you want to analyze **relationships?**

Consider scatter plots, heat maps, and networks





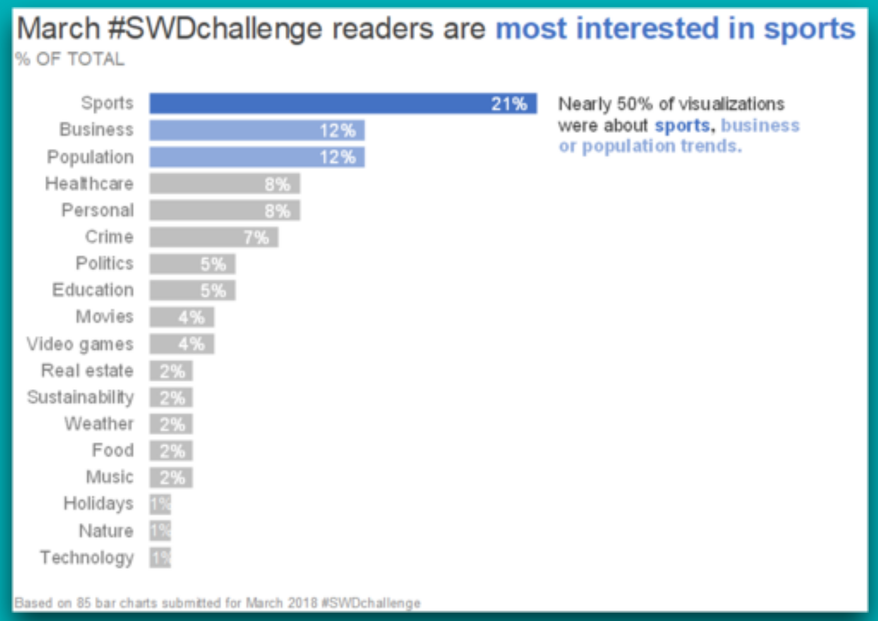
https://chartio.com/learn/charts/what-is-a-scatter-plot/

https://www.bloomberg.com/professional/blog/heatmap-shows-economy-humming-pre-purge-clip/

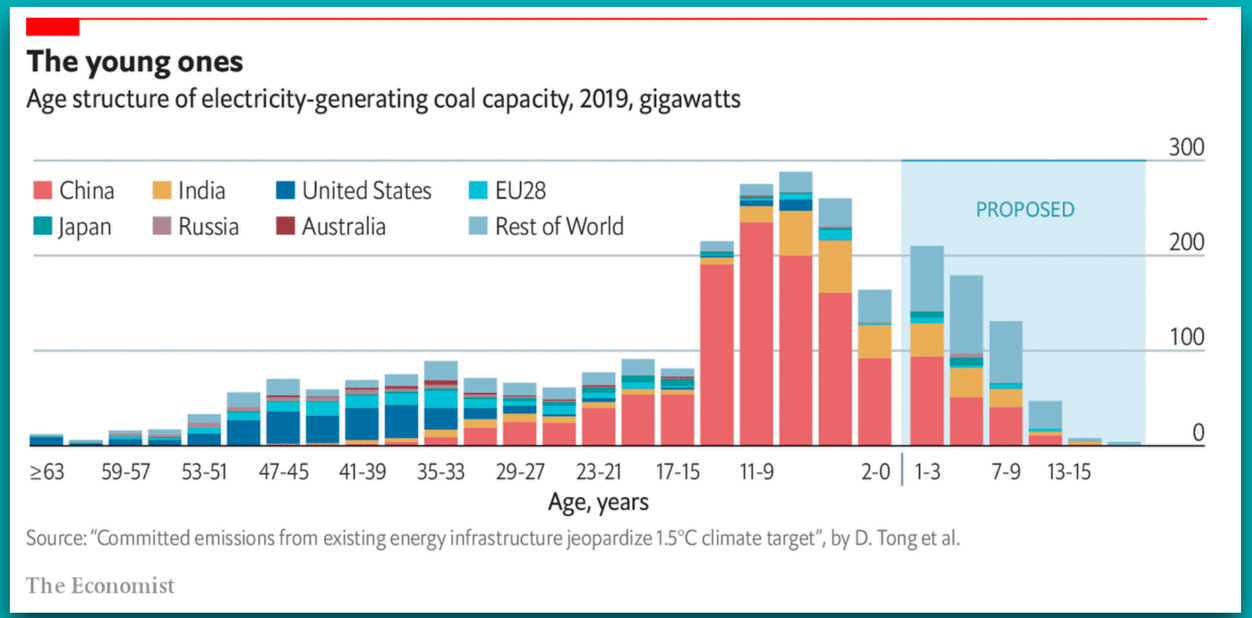
http://www.sixdegreesoffrancisbacon.com/?ids=10000473&min_confidence=60&type=network

Do you want to **rank** or compare **quantities?**

Consider bar charts - horizontal, vertical, and stacked!



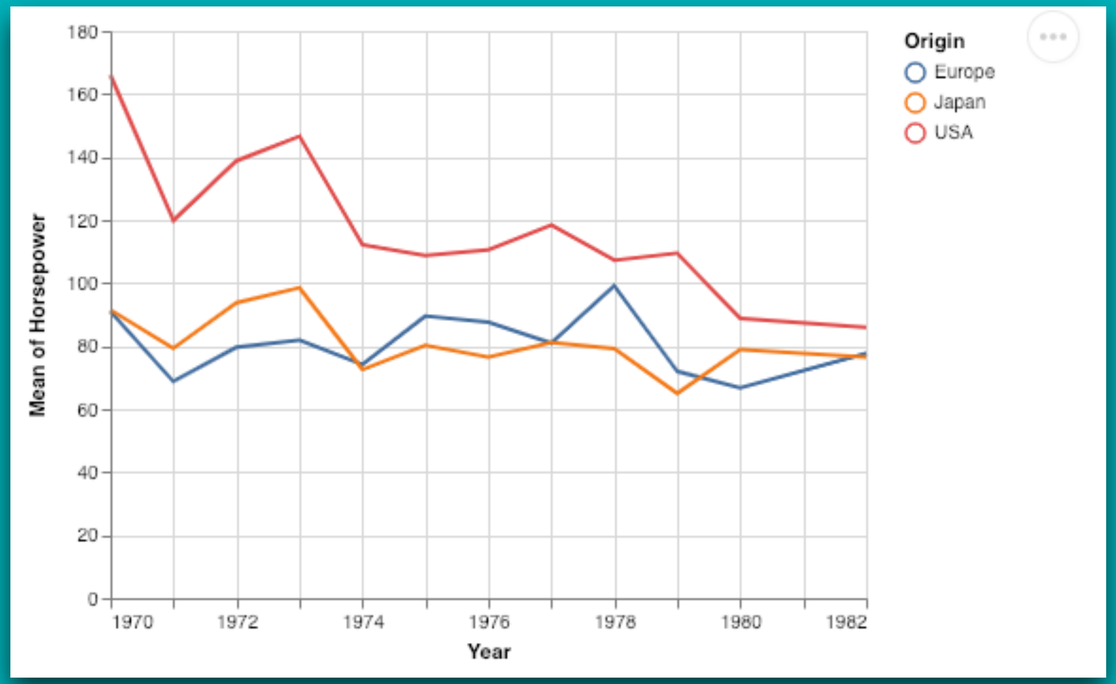
http://www.storytellingwithdata.com/blog/2018/3/9/bring-on-the-bar-charts



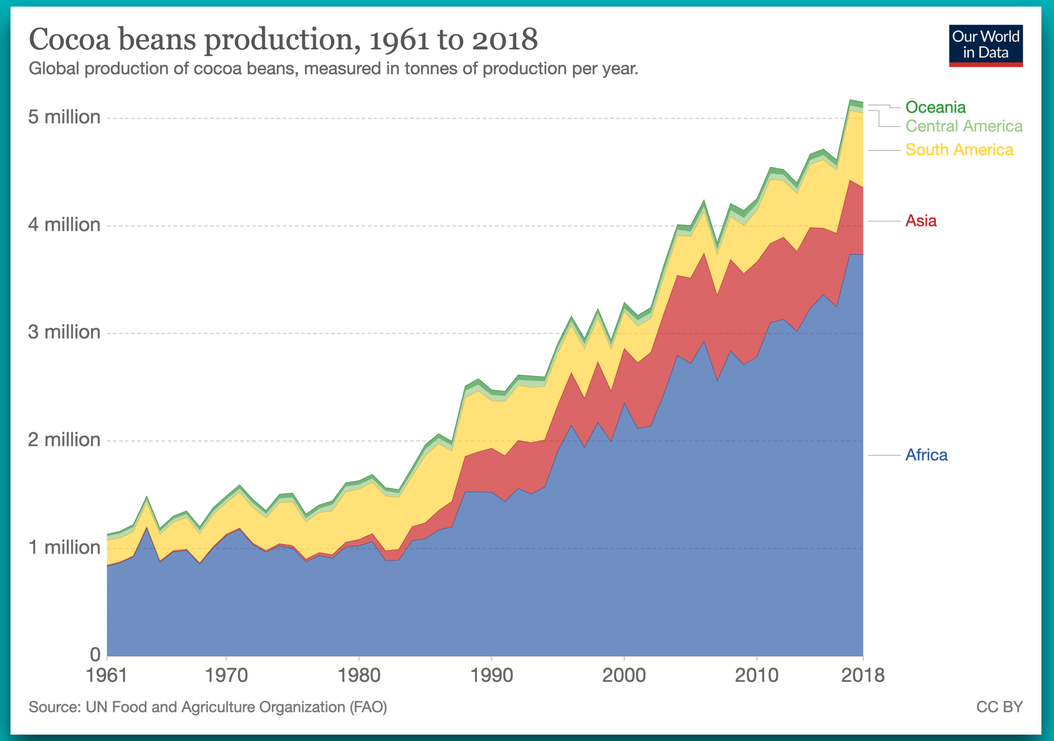
https://www.economist.com/graphic-detail/2020/12/04/dethroning-king-coal

Do you want to look at data **over time?**

Consider line graphs and area charts



https://medium.com/analytics-vidhya/exploratory-data-visualisation-with-altair-b8d85494795c



ourworldindata.org/grapher/cocoa-beans-production-by-region

DEMO

bar & line graphs

Choosing the Right Visualization for Your Data

For further guidance…

Visualization Cheat Sheets

https://visualizationcheatsheets.github.io/relative.html

Choosing among **30 types** of data visualizations!

https://towardsdatascience.com/data-visualization-how-to-choose-the-right-chart-part-1-d4c550085ea7

Principles of Good Data Viz. Design

Meaningful chart titles, axes labels, and legends

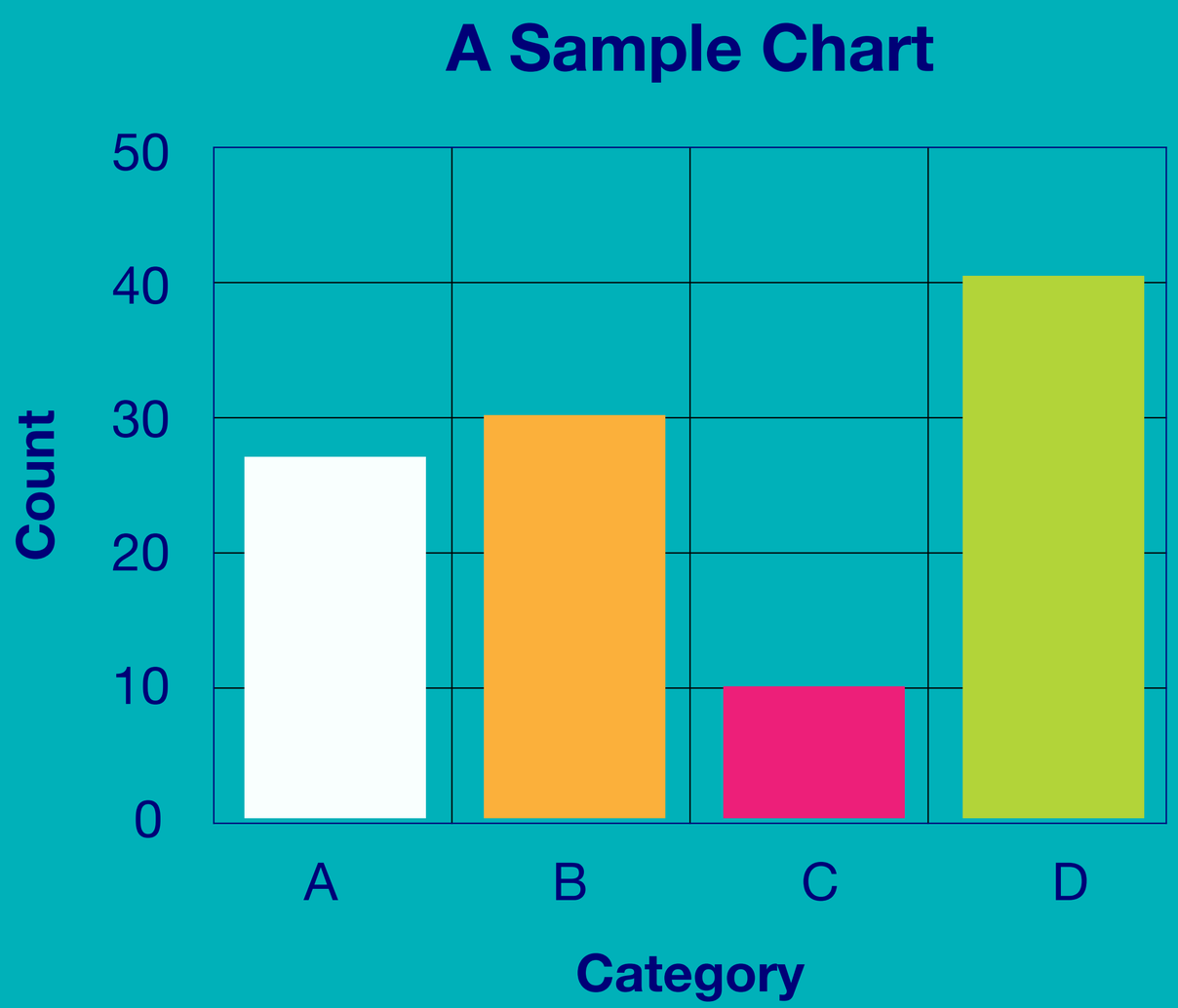
Not visualizing more than about 5 data characteristics at once

Use color-blind friendly palettes as much as possible

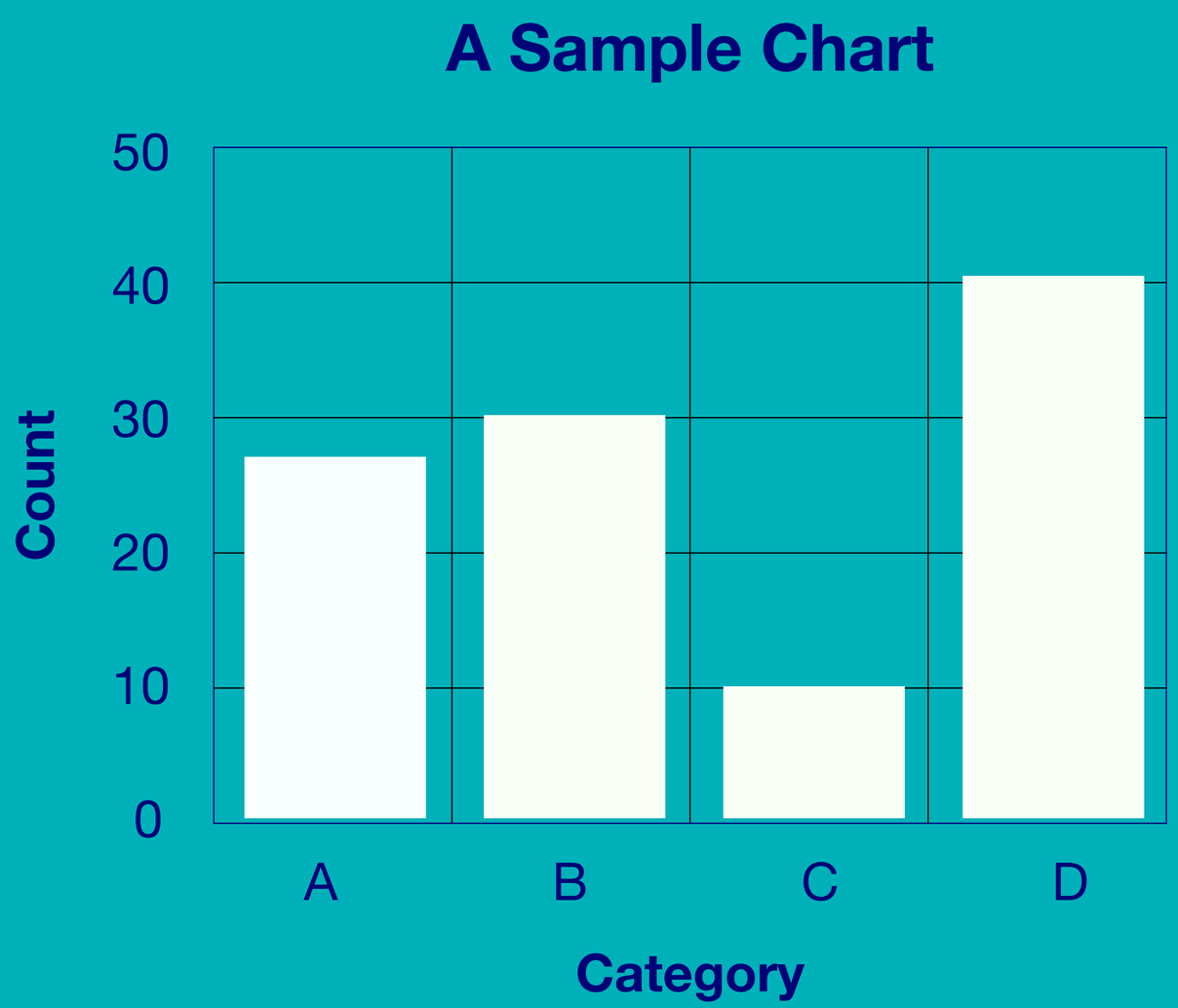
Traceable changes in interactive or dynamic charts

Minimize the **data:ink ratio** - removing grids and adding labels

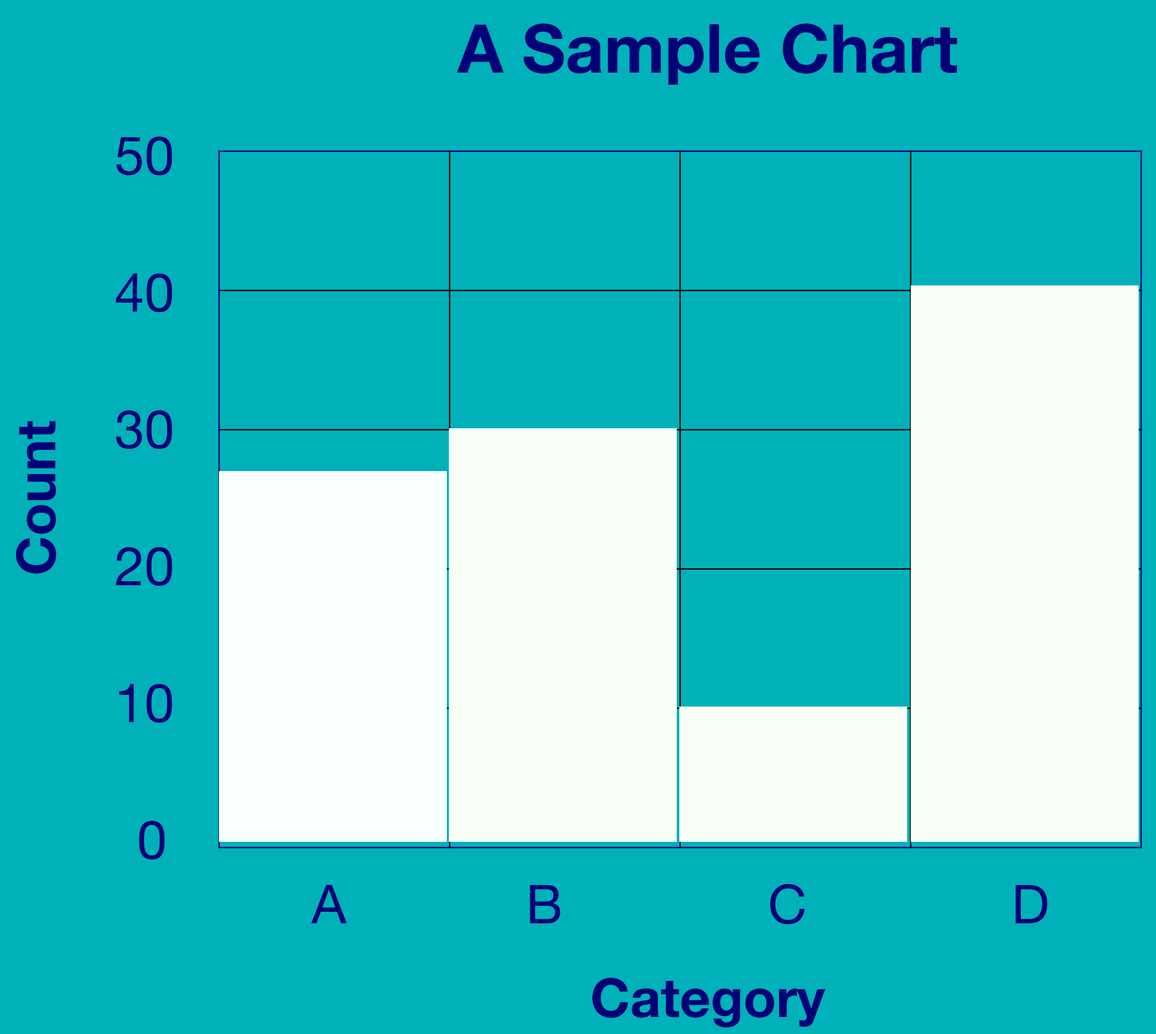
The Data:Ink Ratio



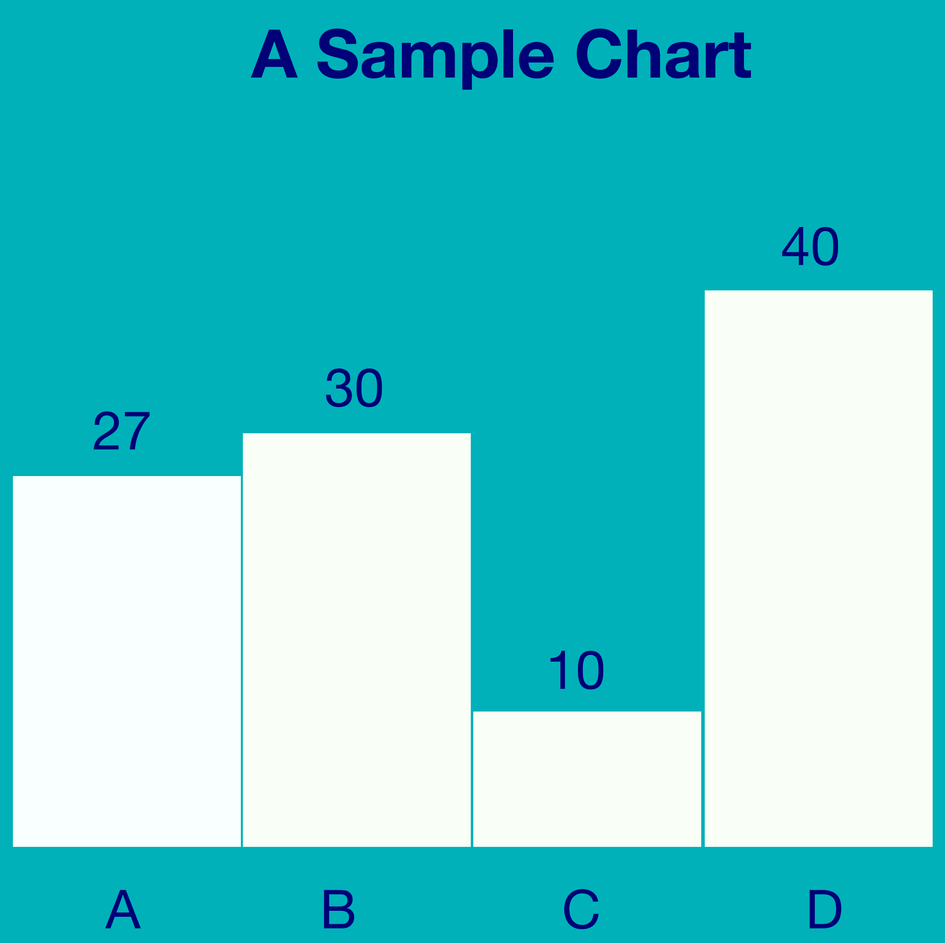
The Data:Ink Ratio



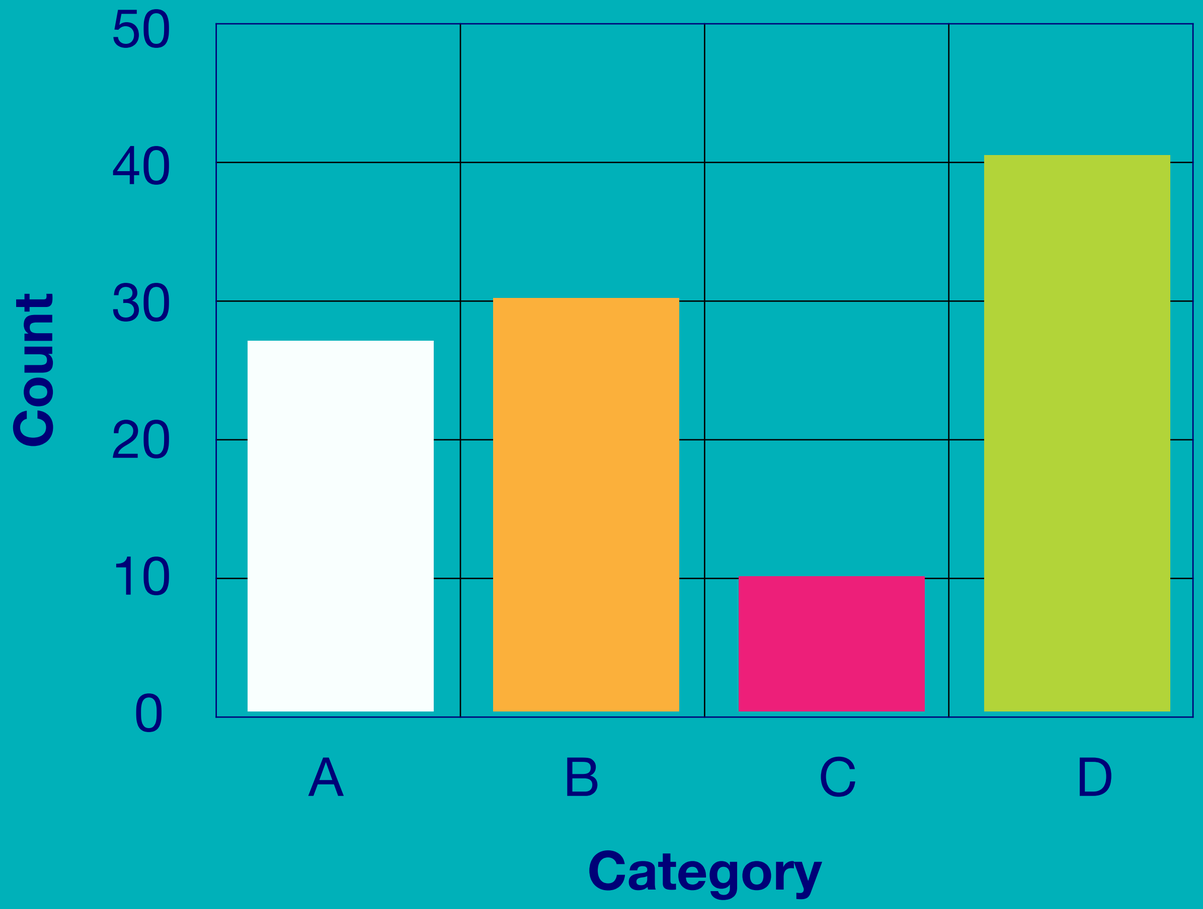
The Data:Ink Ratio



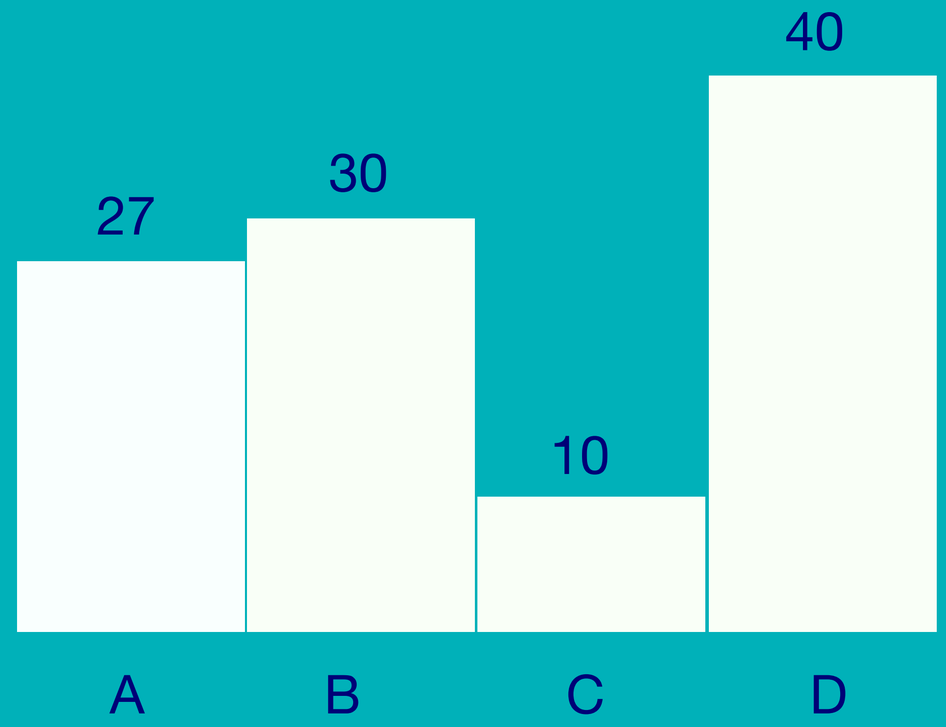
The Data:Ink Ratio



A Sample Chart



A Sample Chart



Selections from the Altair Documentation

Getting Started

https://altair-viz.github.io/getting_started/starting.html#starting

Customizing Visualizations

https://altair-viz.github.io/user_guide/customization.html

Top-Level Chart Configuration

https://altair-viz.github.io/user_guide/configuration.html

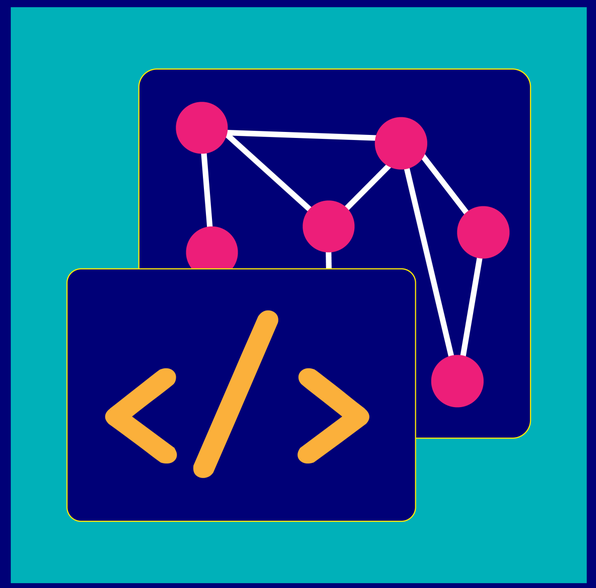
Quickly Building Data Visualizations

Raw Graphs - rawgraphs.io

Tableau (student account is free!) - www.tableau.com

DEMO

Tableau: World Indicators



Thanks everyone!

Please provide course feedback here!

The CDCS uses the course feedback to guide future course offerings and to ensure budget is available to run the courses.