

Building Data Visualizations Using Plotly

BUILDING BASIC CHARTS WITH PLOTLY



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Overview

Plotly offers suite of analytics and visualization tools

Spans business intelligence, open-source libraries and platforms

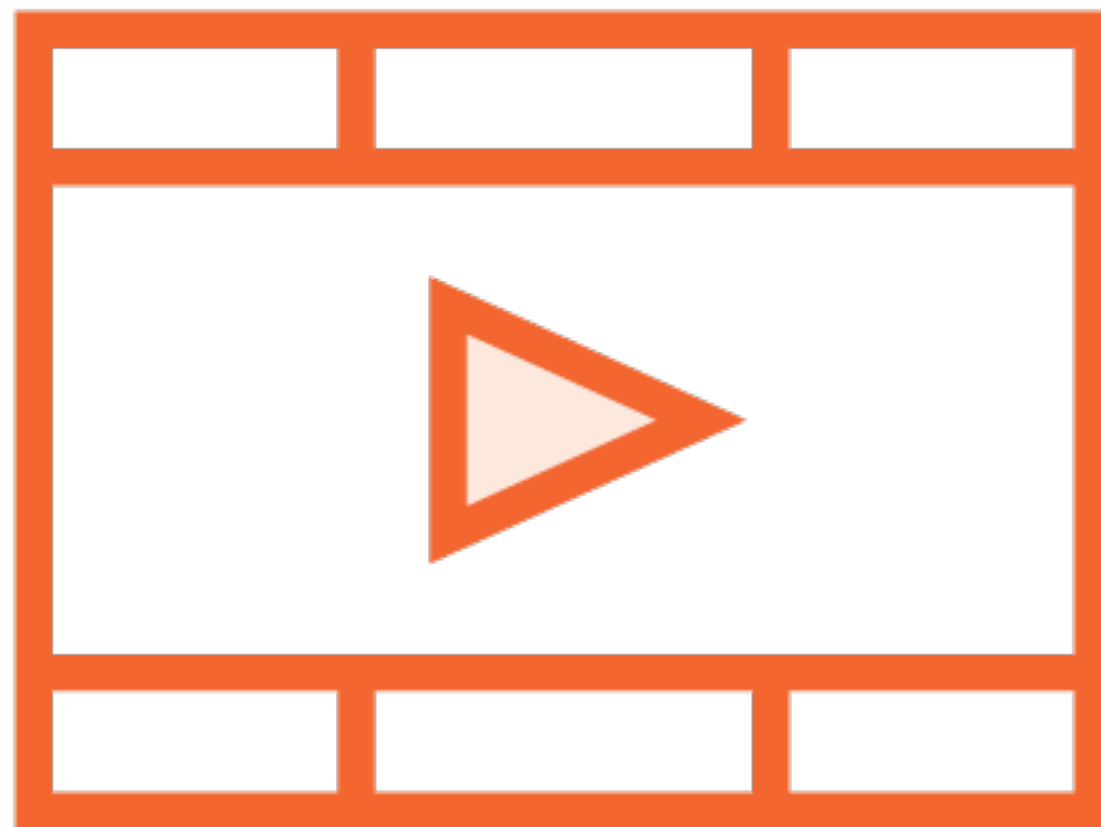
Emphasis on online collaboration

This course focuses on plotly.py

High-quality online visualizations

Prerequisites and Course Outline

Prerequisite Courses



Python: Getting Started
Python Fundamentals

Software and Skills



Basic understanding of Python programming (Python 3)

Working with Jupyter notebooks

Basic knowledge of statistics

Course Outline



Building basic charts

- Line, bar and scatter charts
- Histograms and pie charts
- Inset plots
- Box plots

Plotting statistical and financial data

- Bubble charts and maps
- Heat maps
- Time-series and candlestick charts
- Funnel charts

Building advanced plots

- Gantt charts
- Sankey diagrams
- 3D charts
- Animations

Introducing Plotly

Plotly

Plotly, also known by its URL, Plot.ly, is a technical computing company headquartered in Montreal, Quebec, that develops online data analytics and visualization tools.

Wikipedia

Plotly

Plotly



“Business Intelligence”

“Data Science & Open Source”

“Platforms”

Chart Studio

Dashboards & Reporting

Slide Decks

Dash

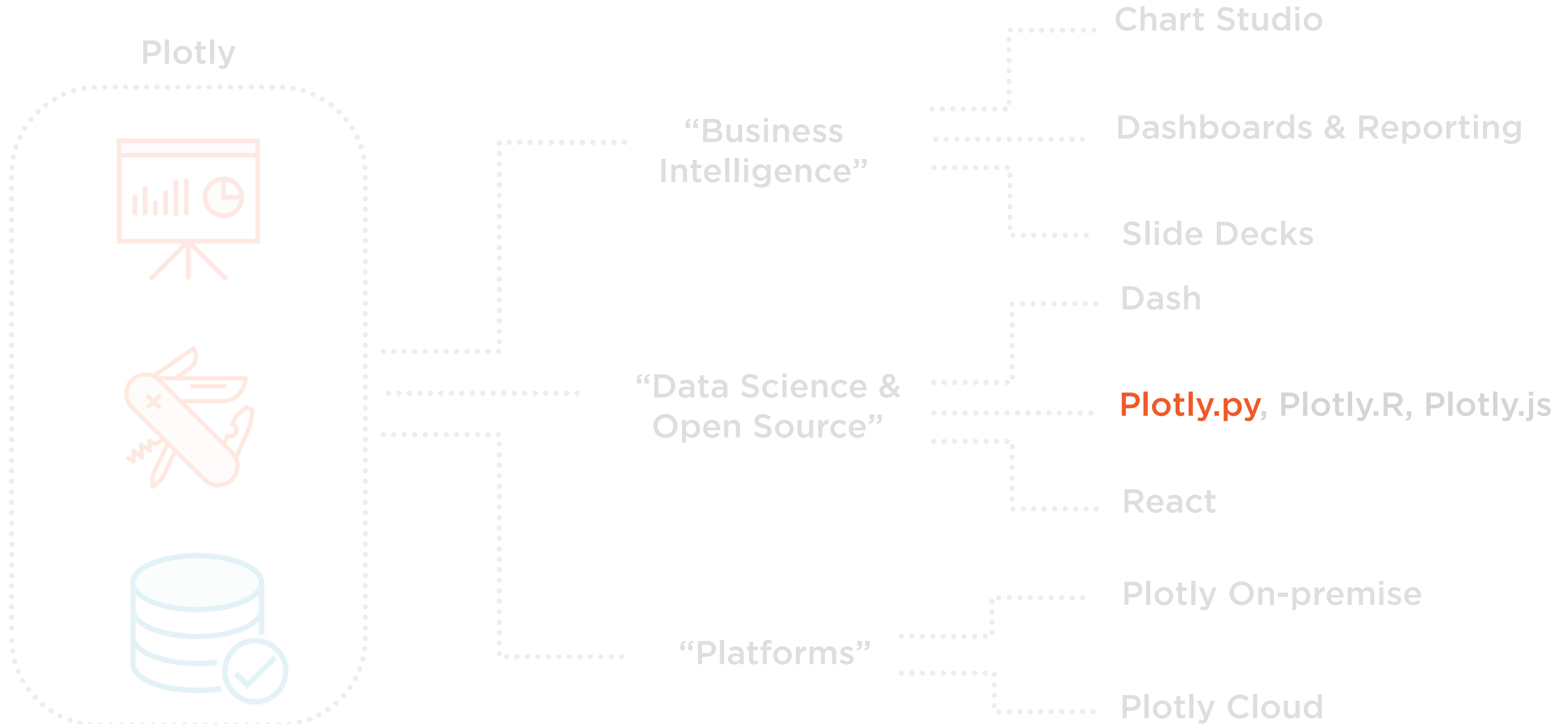
Plotly.py, Plotly.R, Plotly.js

React

Plotly On-premise

Plotly Cloud

Plotly



Plotly



Data visualization toolbox

Create interactive plots

Online collaboration and sharing

Export to variety of formats



Plotly APIs

Scala

Python

R

JavaScript

MATLAB

Node.js

Visualization Libraries in Python

Matplotlib

Powerful, complex library for plotting within Python notebooks

Seaborn

High-level library based on Matplotlib - build polished charts easily

Bokeh

Not built on Matplotlib; focused on browser-based visualizations

Plotly.py

Not built on Matplotlib either; online collaboration on visualizations

Plotly.py

Plotly's Python graphing library makes interactive, publication-quality graphs online.

plot.ly/python

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Plotly



Under the hood, each plotly graph is a JSON object

Plotly



Python API interacts with the plotly.js library

Plotly



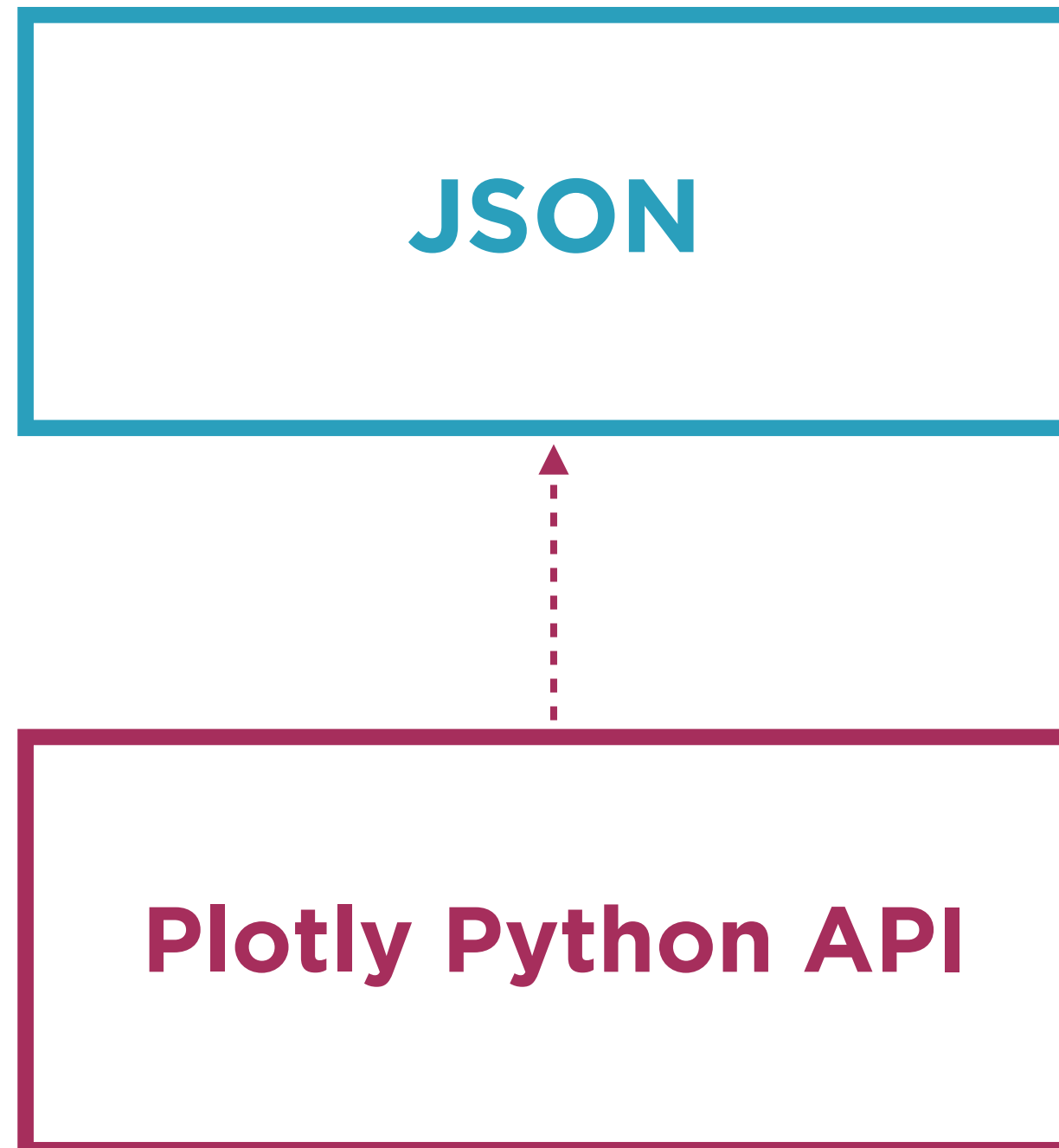
Each object is based on the plotly.js library

Plotly



This object supports visualizations and interactivity

Plotly



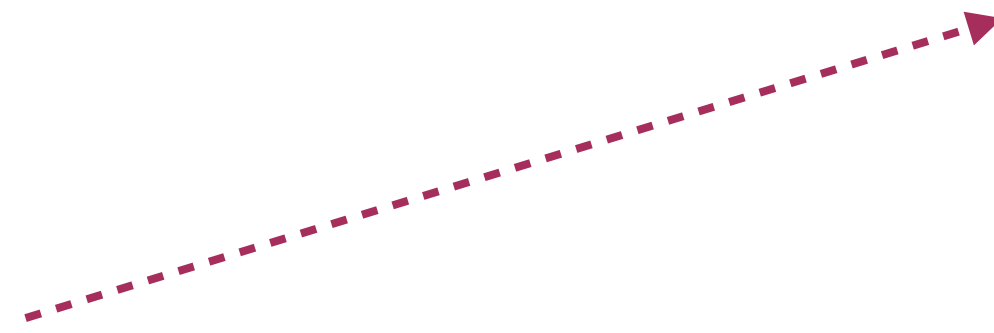
Python API interacts with the plotly.js library

Plotly

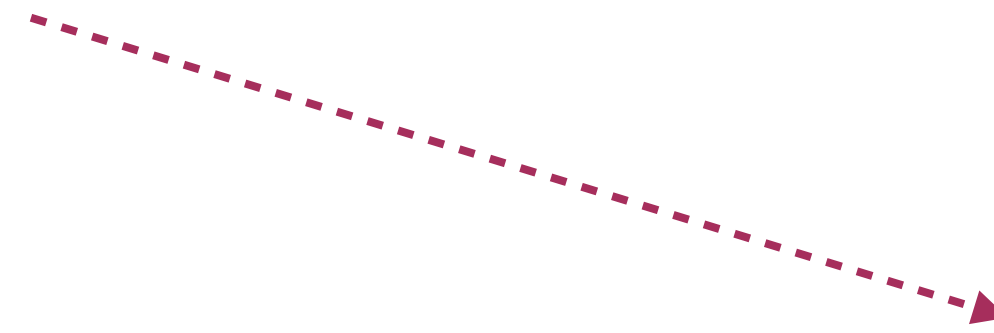


Python API allows Python developers to create plots

Plotly



`plotly.plotly`



`plotly.graph_objs`

Plotly

`plotly.plotly`

Communicate with
plotly servers

`plotly.graph_objs`

Generate graph
objects

Elements of a Plot

Data

List object in python which contains the traces

Layout

Object that defines the look of the plot

Figure

Final object to actually be plotted

Elements of a Plot

Data

List object in python which contains the traces

Layout

Object that defines the look of the plot

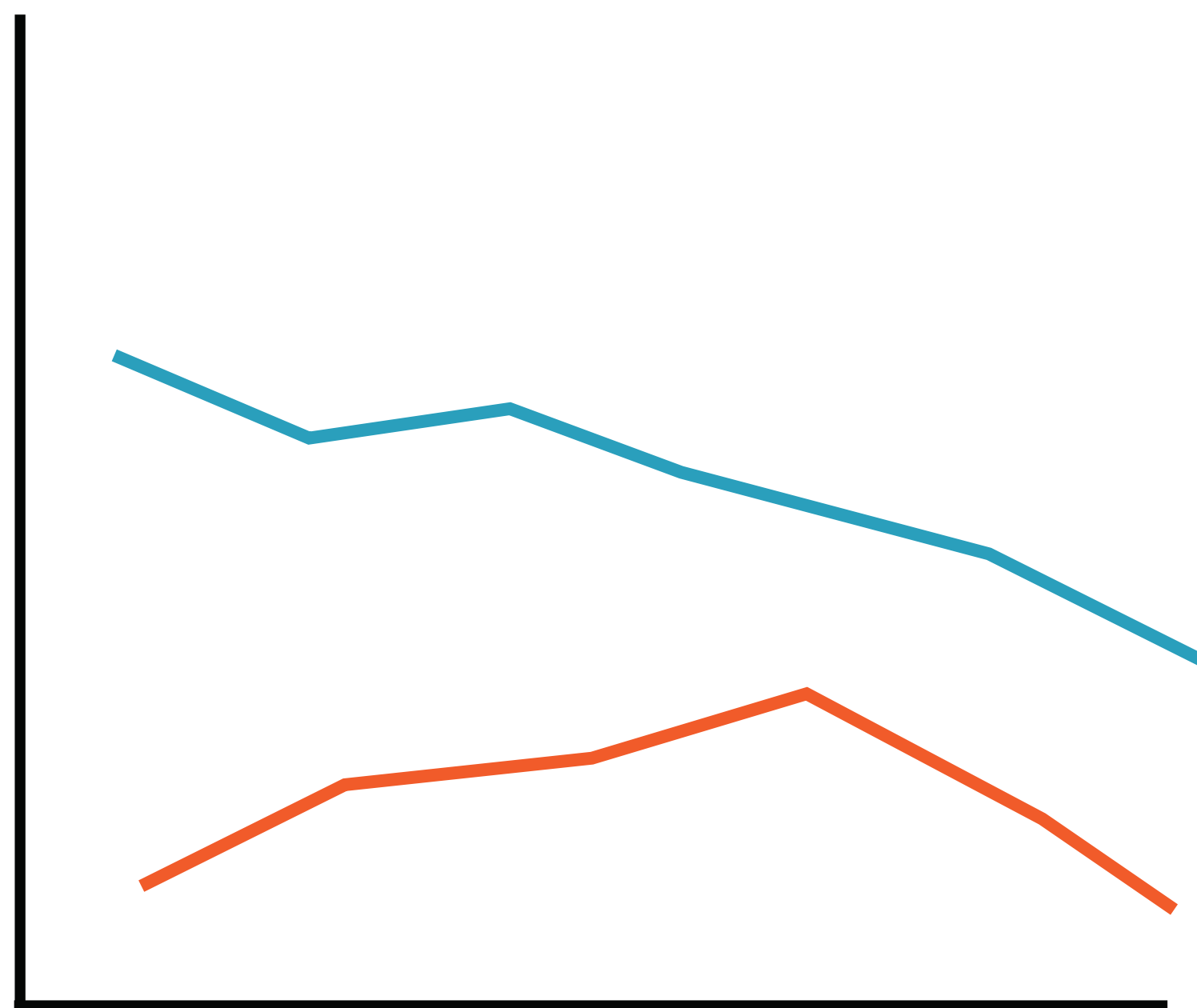
Figure

Final object to actually be plotted

Trace

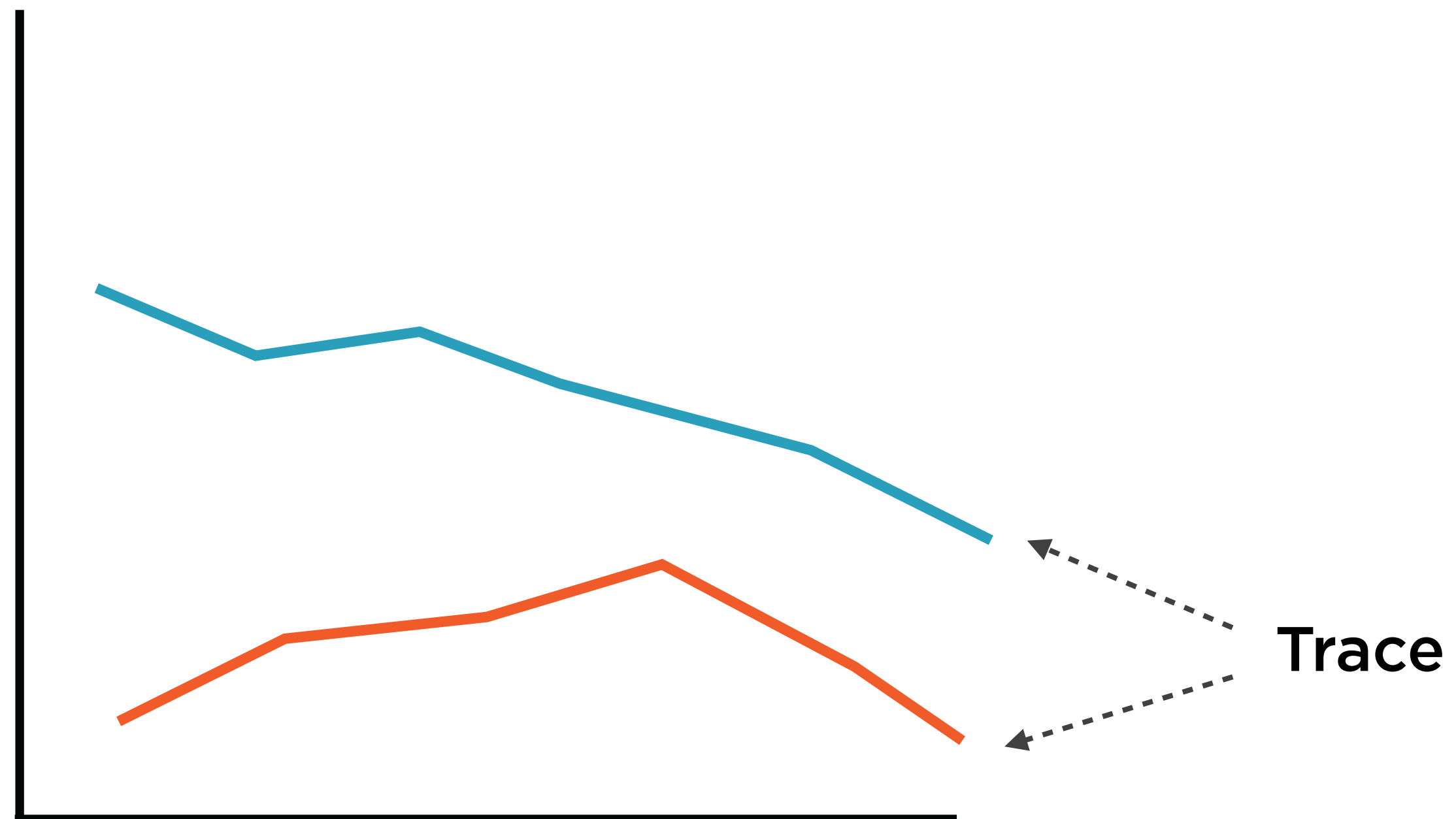
Each individual element of the figure is called a trace

Trace



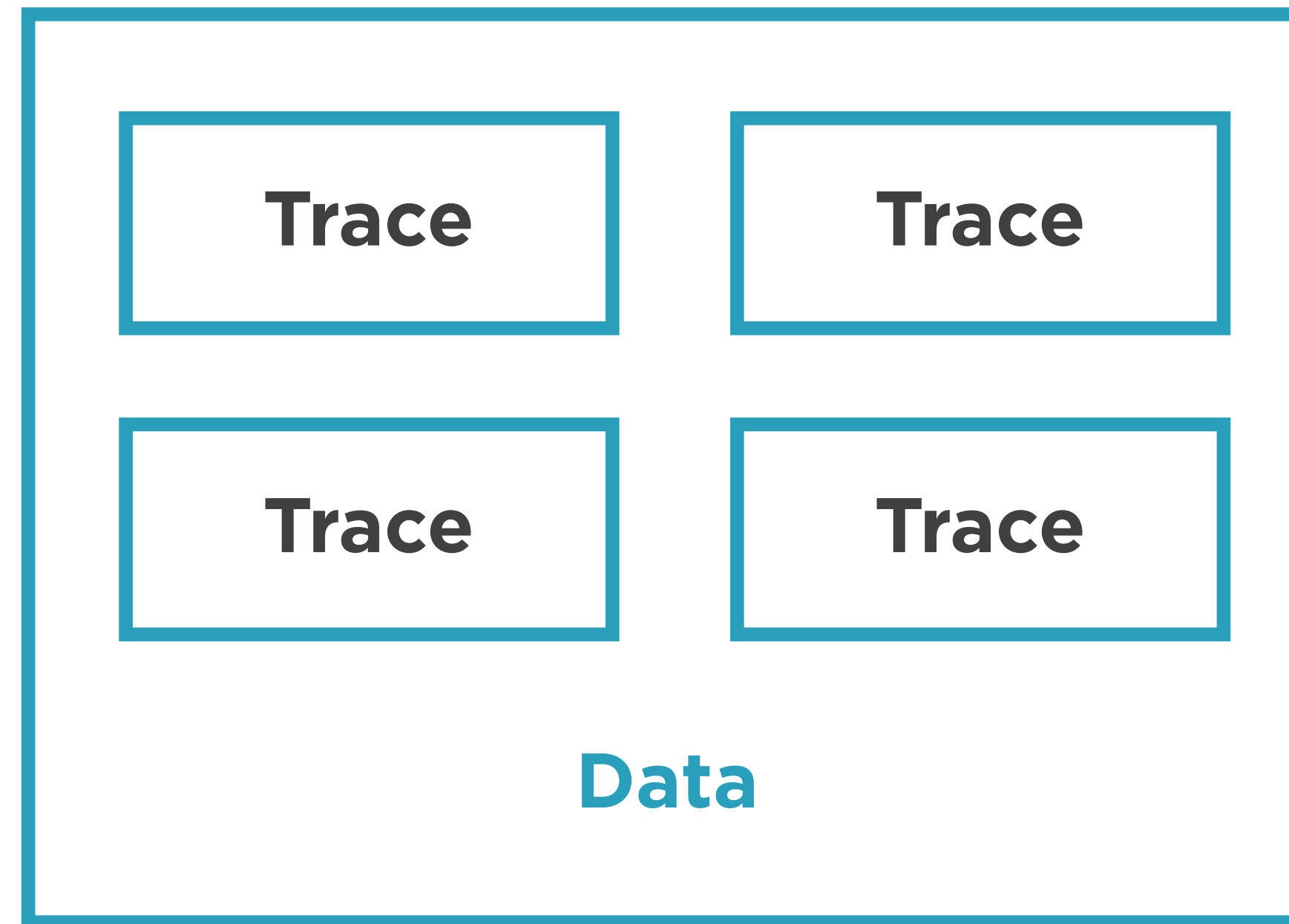
Line chart with two different categories

Trace



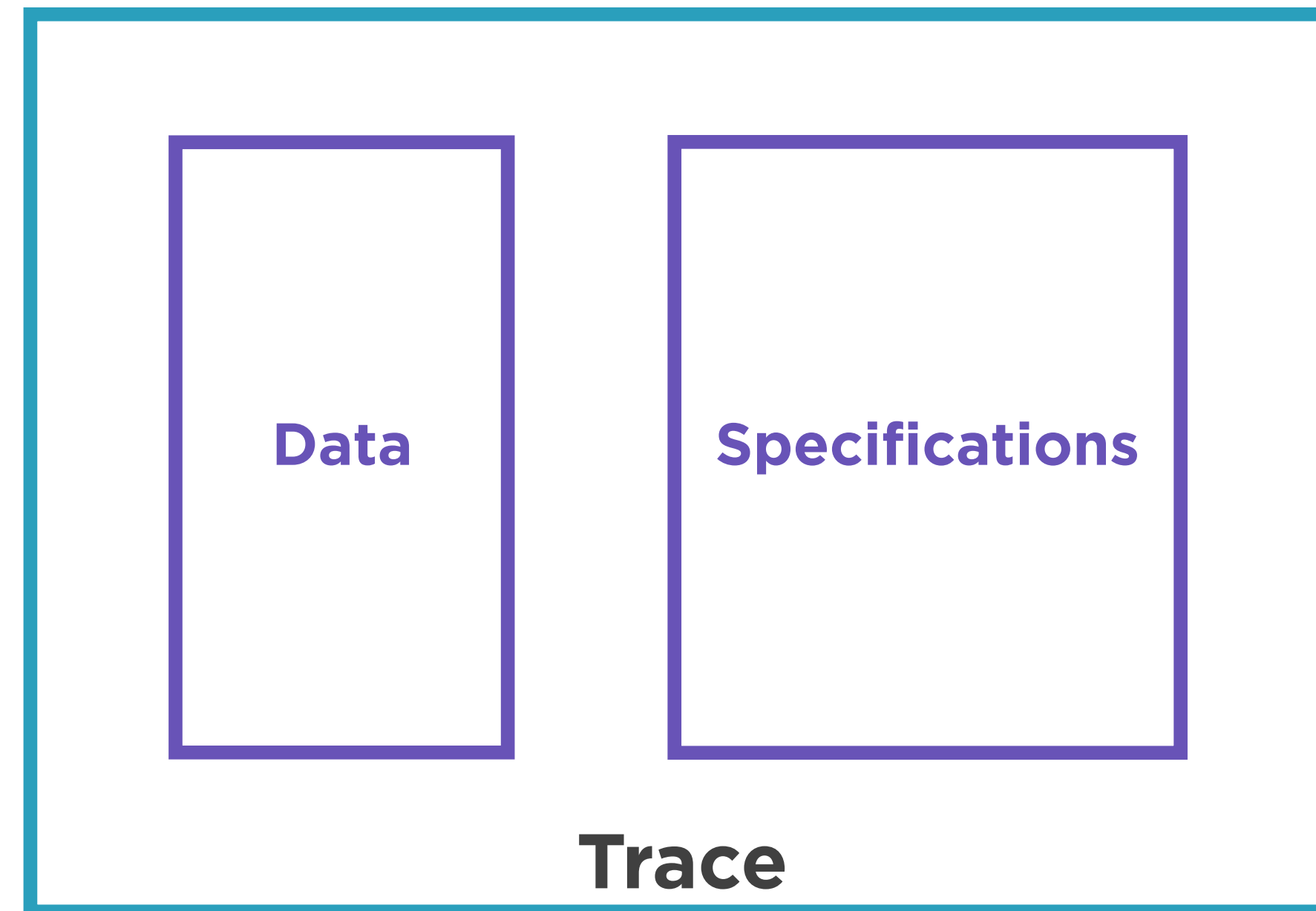
Each line is a trace

Data



Data object encapsulates multiple traces

Trace



Each trace contains collection of data and its plotting specifications

Elements of a Plot

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List object in python which contains the traces

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Final object to actually be plotted

Elements of a Plot

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List object in python which contains the traces

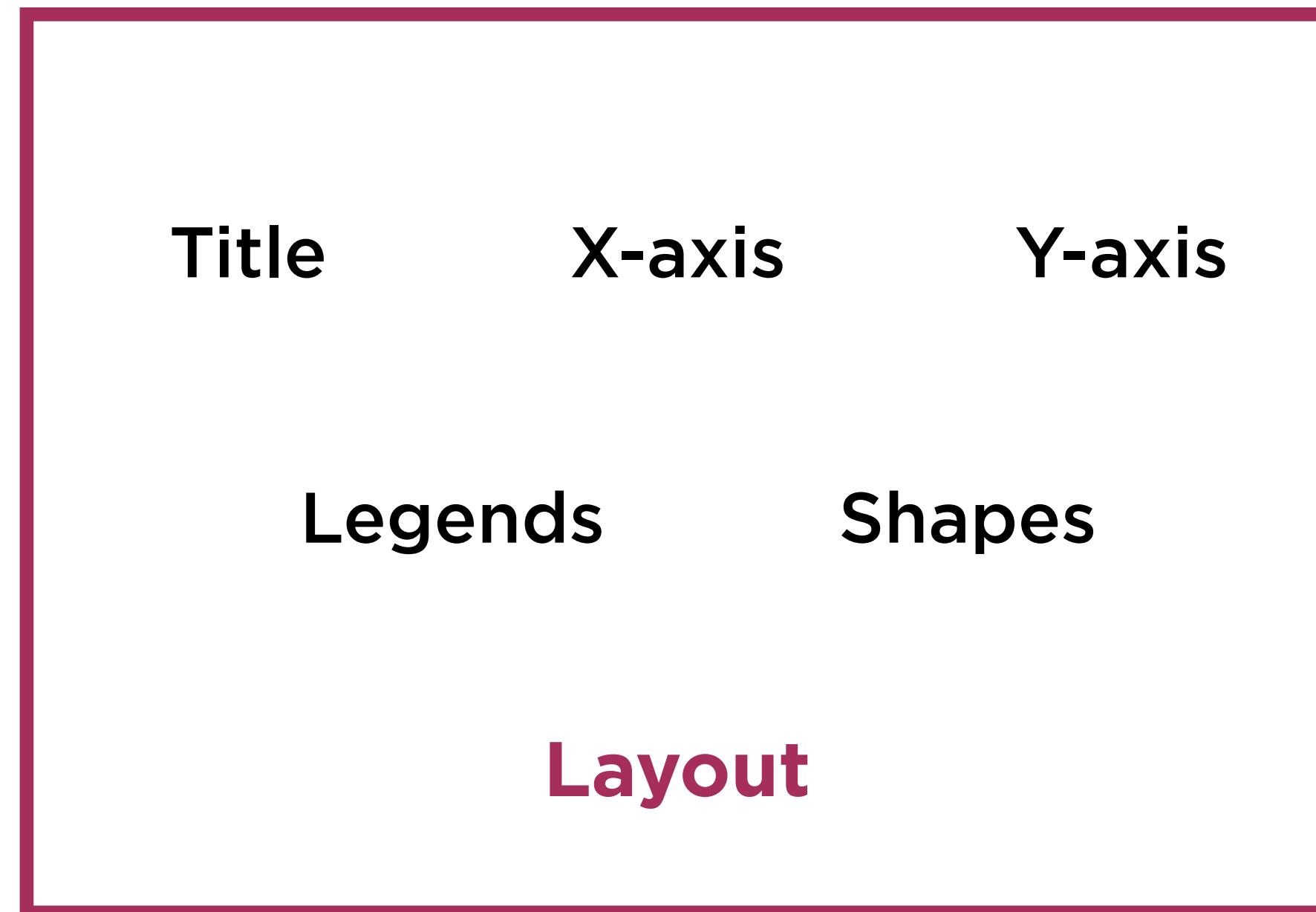
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Elements of a Plot

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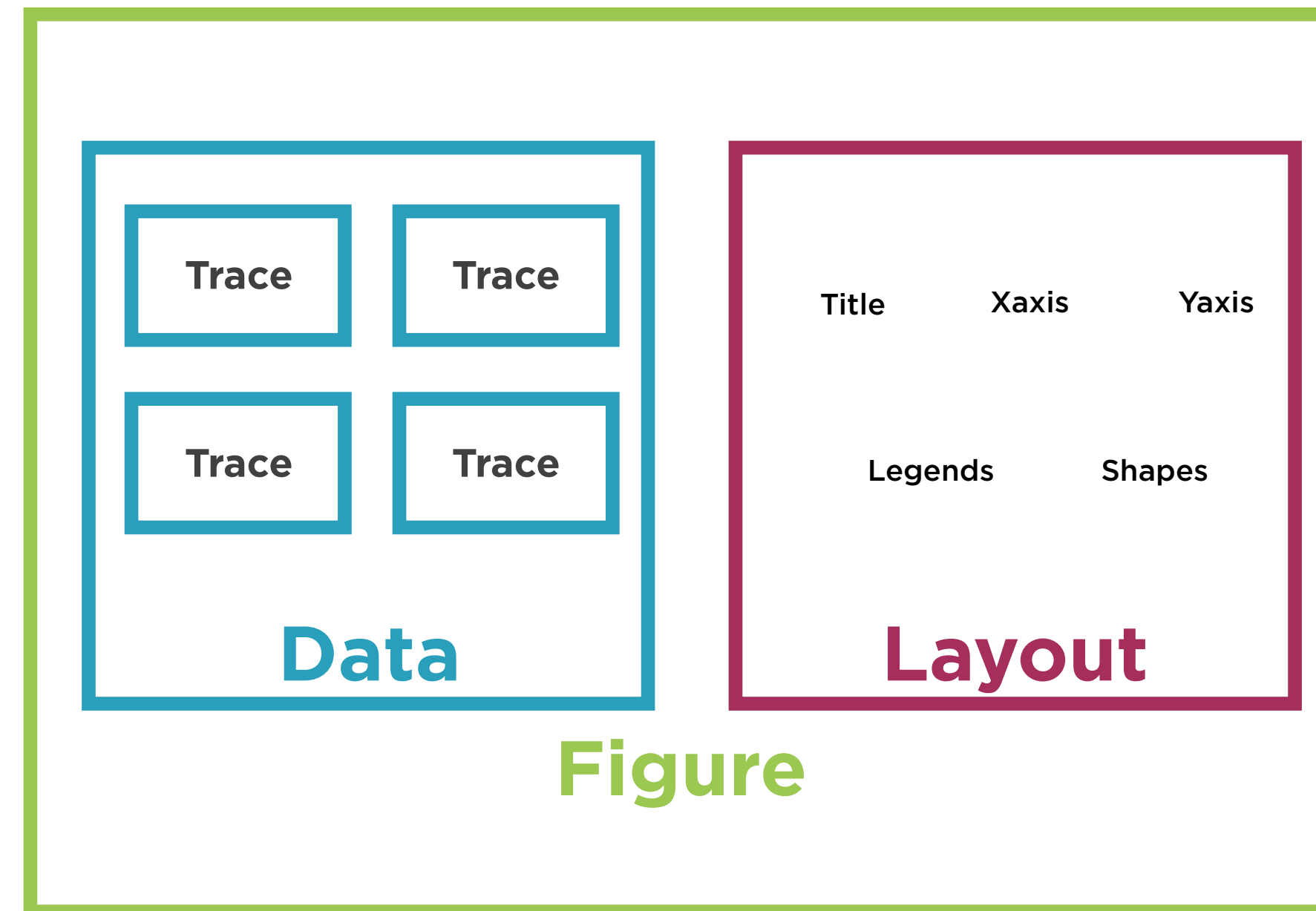
Layout

Object that defines the look of the plot

Figure

Final object to actually be plotted

Figure



Dictionary-like object that contains both the data object and the layout object

Demo

Installation and offline plots

Demo

Online plots

Demo

Line charts

Demo

Pie charts

Demo

Bar charts

Demo

Histograms

Demo

Inset plots

Demo

Box plots

Demo

Scatter plots

Summary

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