Tool Overview (D3 vs Python Matplotlib)

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Capabilities

D3（a javascript library for manipulating data-based documents）:

1.D3 addresses the problem of how to effectively manipulate documents based on data. This avoids idiosyncratic rendering and provides additional extensibility, while taking full advantage of web standards such as CSS2, HTML5, and SVG.

2.D3 allows you to bind arbitrary data to a DOM object and then bind some data-driven transactions to the document.

3.D3 supports big data collection and interactive, dynamic behavior of animation.

4.D3's functional style allows for code reuse.

Matplotlib (a drawing library for Python and its library NumPy) :

1.It provides an object-oriented API for embedding drawings into applications using generic GUI toolkits such as Tkinter, wxPython, Qt, or GTK.

2.It comes with default drawing styles for built-in code and deep integration with Python.It is highly dependent on other packages, such as Numpy, and only works with Python.

Data type & Encoding methods

D3 data type & encoding methods:

D3 supports handling different types of data, so it basically supports arrays of arbitrary numbers, strings, or objects (which themselves may contain other arrays or key/value tuples). D3 has good support for JSON(and GeoJSON) and even provides some built-in methods to load CSV files.

Matplotlib data type & encoding methods:

Matplotlib’s data type is as same as python :Numbers,String,List,Tuple,Dictionary. And the encoding methods depend on Numpy and Pandas.

Visualization types supported

D3 visualization types:

Graph types : Statistical charts, engineering drawings, functional graphics, maps, photographs, summary drawings, tables, engineering drawings, technical illustrations, user interface diagrams…

Application fields ：Biological data visualization, chemical imaging, geographic visualization, information visualization, medical imaging, product visualization, software visualization, engineering drawing, user interface design…

Matplotlib visualization types:

Graph types : Statistical charts, functional graphics, tables, engineering drawings, technical illustrations…

Application fields ：Paper data visualization, statistical visualization, engineering visualization…

API

D3 API:

Behavior - Reusable interaction behavior.

Core - includes selectors, transitions, data processing, localization, colors, etc.

Geo-spherical coordinates, latitude and longitude operations.

Geometry - provides utility for drawing 2D geometric shapes.

Layout - Deduces auxiliary data for positioning elements.

Scale - Conversion between data coding and visual coding.

Scalable vector Graphics - provides utilities for creating scalable vector graphics.

Time - Parses or formats time, calculates calendar intervals, etc.

Matplotlib API:

Drawing API

Object-oriented APIS

PylabAPI (not recommended)

Capability for customization

Matplotlib is no match for D3 in terms of customization. First, because Matplotlib is deeply dependent on Python and other packages, there are few data types supported. The second reason is that D3 has a more freeform DOM that users can manipulate freely.