Exploring Geospatial Data with Folium in Python

Introduction to Location Data and Map Making

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Goals for the morning:

Learn the basics of creating interactive maps using Folium in Python

Introduction to Maps

Introduction to Folium

Install Folium and Import Libraries

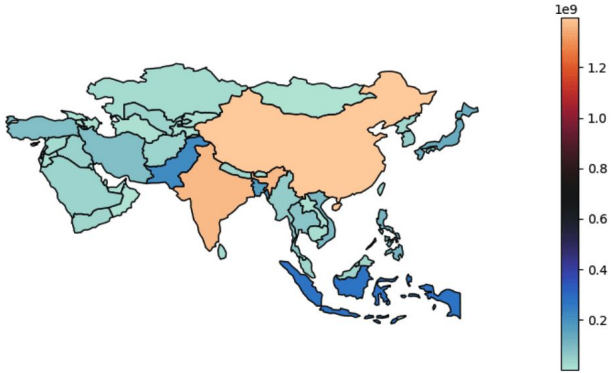
Create a Basic Map

Add Markers to the Map

Customise Markers and Popups

Questions and Comments

DEMO



Choropleth plot of the population for Asia

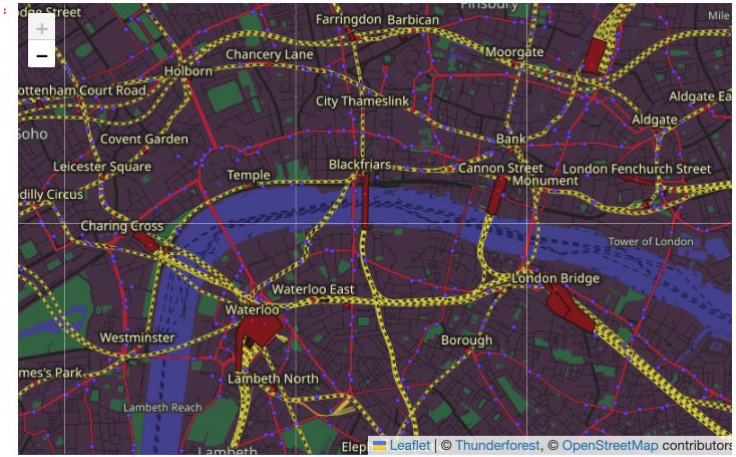
Prerequisite: foundational knowledge in Python

Introduction to Maps: Reference vs Thematic Maps

General Reference Maps

- Show important physical features of an area
- Include natural and man-made features
- Usually meant to help aid in the navigation or discovery of locations
- Usually fairly simple
- Can be stylised based on the intended audience

Introduction to Maps: Reference vs Thematic Maps



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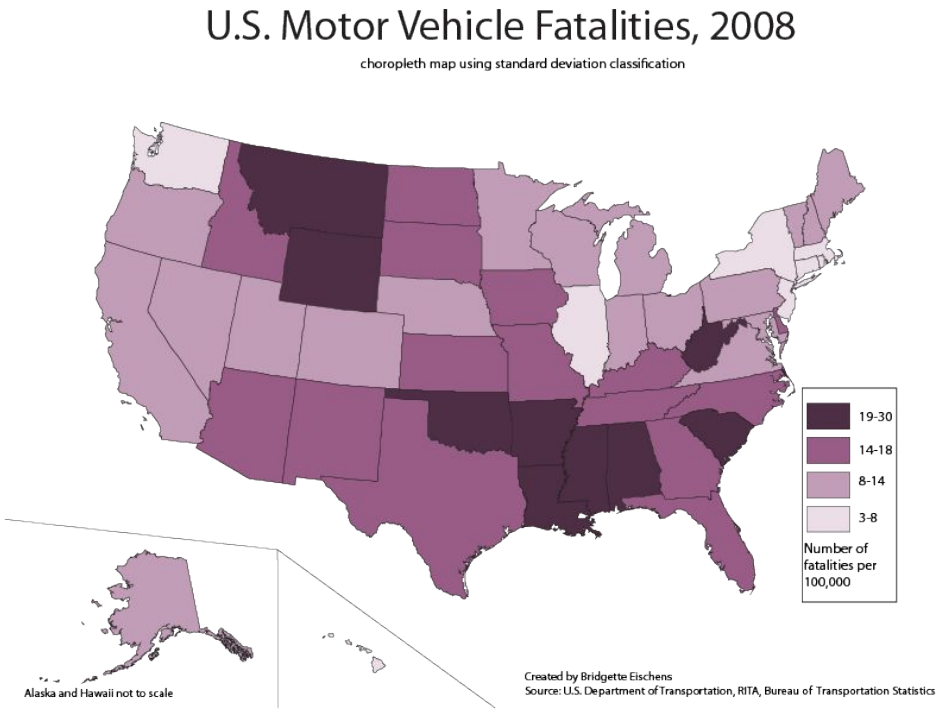
Introduction to Maps: Reference vs Thematic Maps

Thematic Maps

- Focus on a specific theme or subject area
- Features on the map represent the phenomenon being mapped
- Spatial features used for reference



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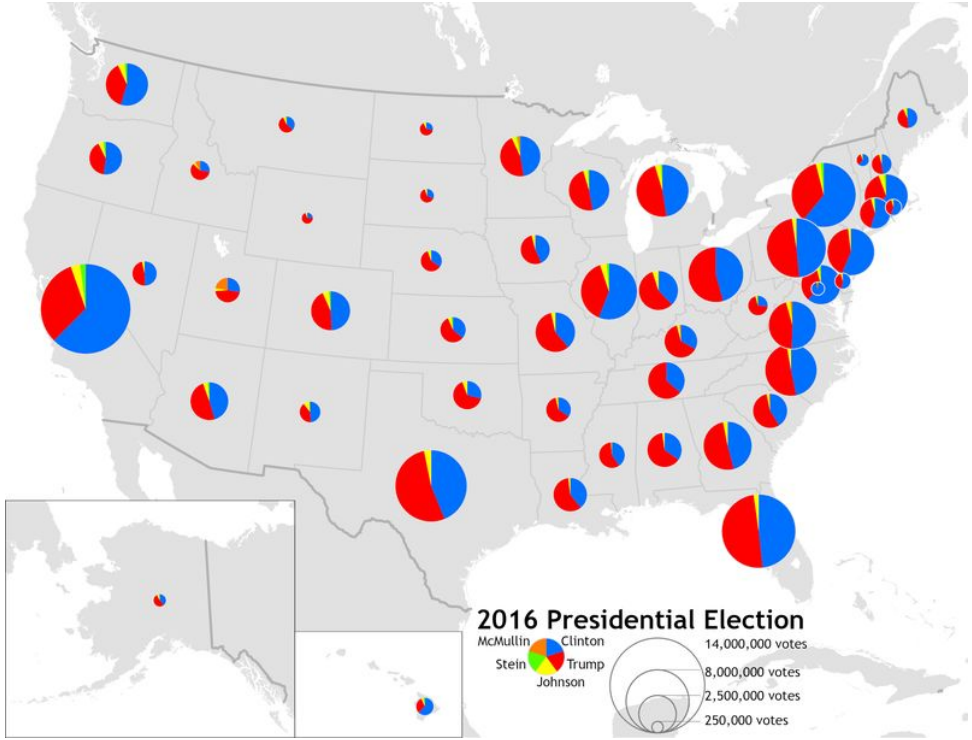

QUIZ TIME!

General reference or thematic map??

General Reference or Thematic Map?

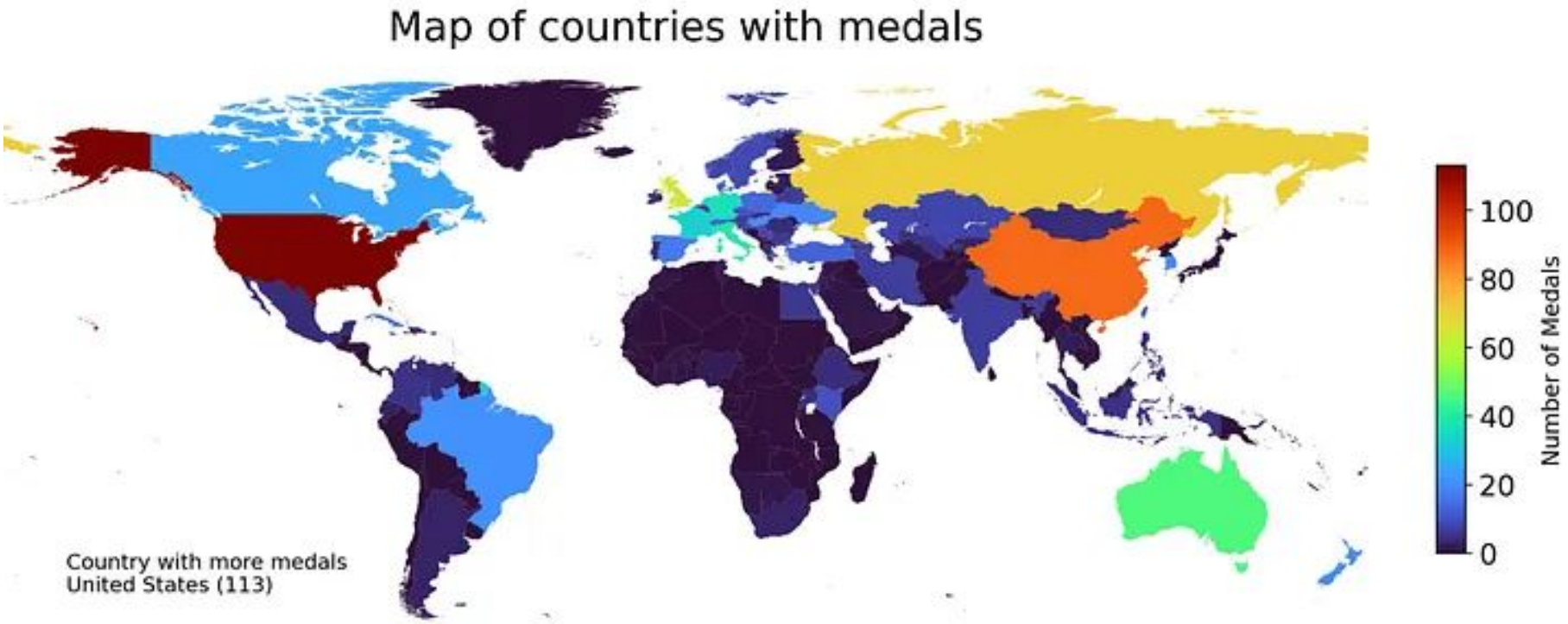

Image source

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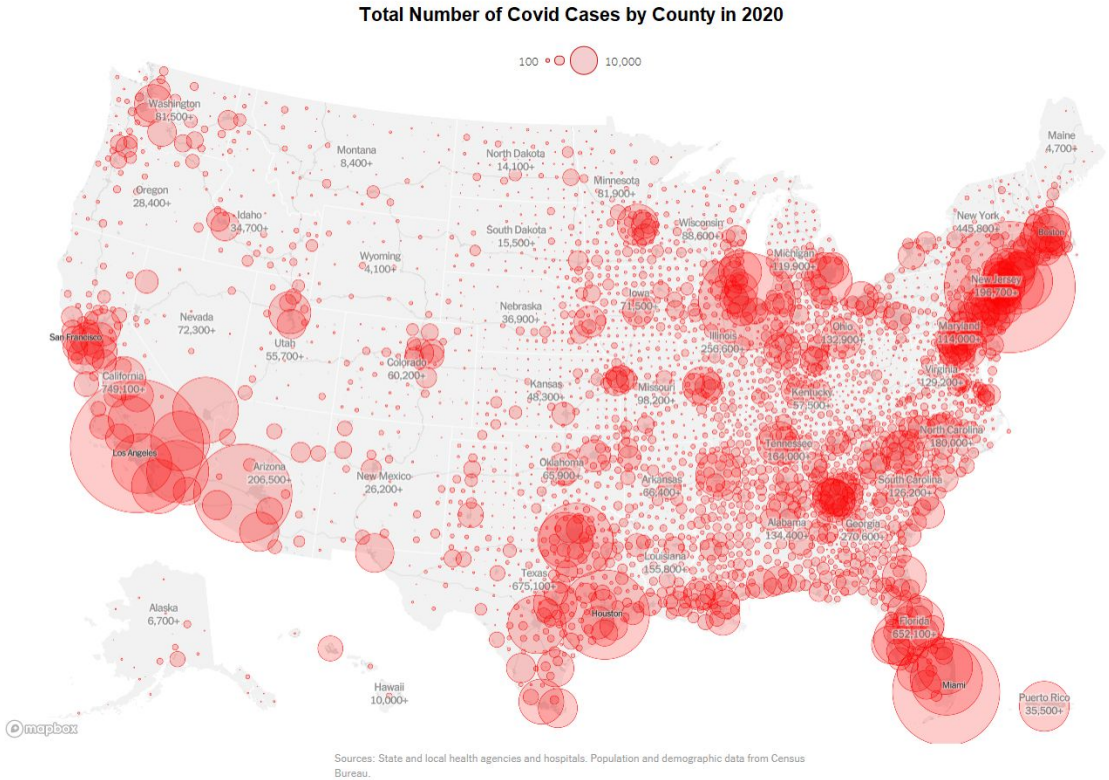


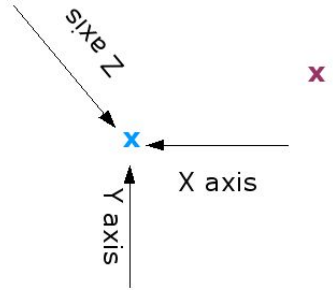
[Covid-19 cases in America]

Introduction to Maps: Types of Location Data

Point geometry

Vector Point Feature

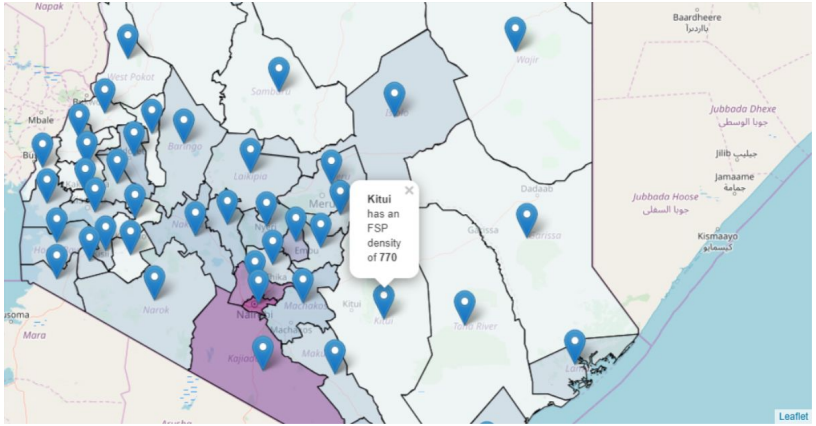
Point Geometry (indicates the x,y and z position of the feature)



Point attributes (describe the feature)

Id, Name, Description
1, Tree, Outside our classroom 2, Light post, At the school entrance

	myid	myorder	lat	long	geometry
0	1	1	36.42	-118.11	POINT (-118.11000 36.42000)
1	1	2	36.40	-118.12	POINT (-118.12000 36.40000)
2	1	3	36.32	-118.07	POINT (-118.07000 36.32000)
3	2	1	36.28	-117.95	POINT (-117.95000 36.28000)
4	2	2	36.17	-117.95	POINT (-117.95000 36.17000)

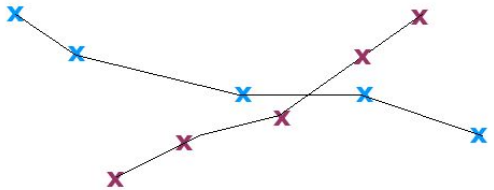


Introduction to Maps: Types of Location Data

Line geometry

Vector Polyline Feature

Polyline Geometry (a series of connected vertices that do not form an enclosed shape)



Polyline attributes (describe the feature)

Id, Name, Description
1, Footpath 1, From class to the playground 2, Footpath 2, From the school gate to the hall

```
LineString([
            [444248.0694, 5.465388e06],
            [444248.2847, 5.465394e06],
            [444248.4852, 5.465400e06]])
```

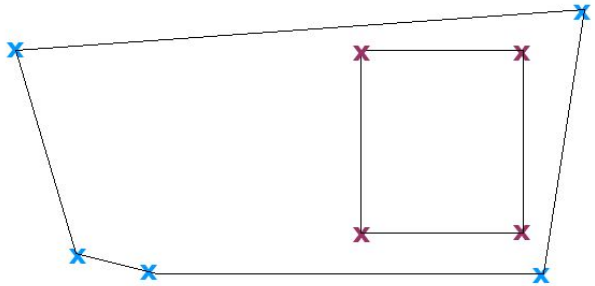
Introduction to Maps: Types of Location Data

Polygon geometry

0	POLYGON ((516401.596 160201.802, 516407.302 16...
1	POLYGON ((519552.998 164295.600, 519508.096 16...
2	POLYGON ((518107.499 167303.399, 518114.301 16...
3	POLYGON ((520336.700 165105.498, 520332.198 16...
4	POLYGON ((521201.203 169275.505, 521204.303 16...

Vector Polygon Feature

Polygon Geometry (a series of connected vertices that do form an enclosed shape)



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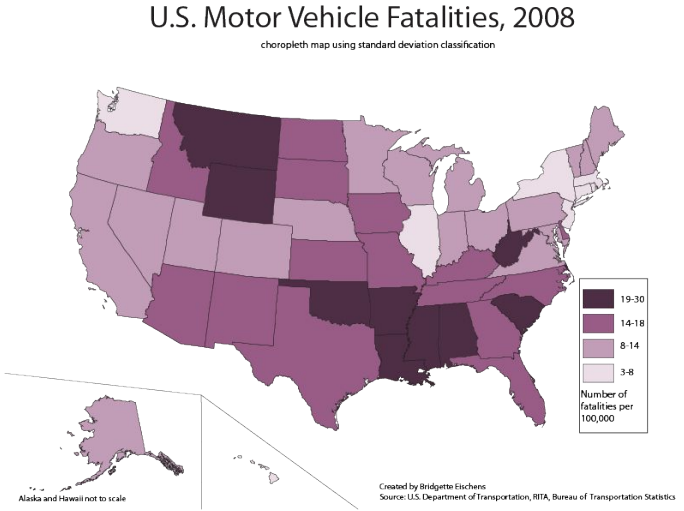
Id, Name, Description
1, School Boundary, Fenceline for the school 2, Sports Field, We play soccer here

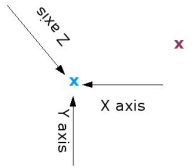


Introduction to Maps: Types of Location Data

Three types of spatial vector data: **point, polyline, polygon**

Vector Point Feature

Point Geometry (indicates the x,y and z position of the feature)



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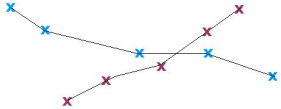

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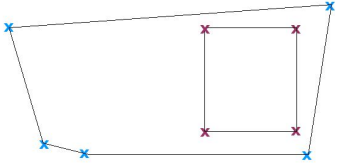

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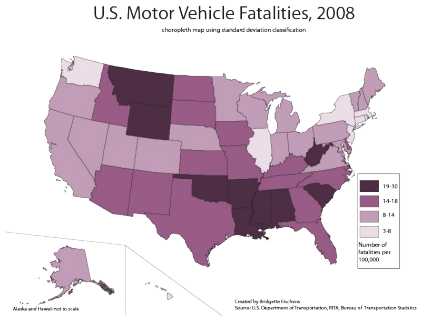
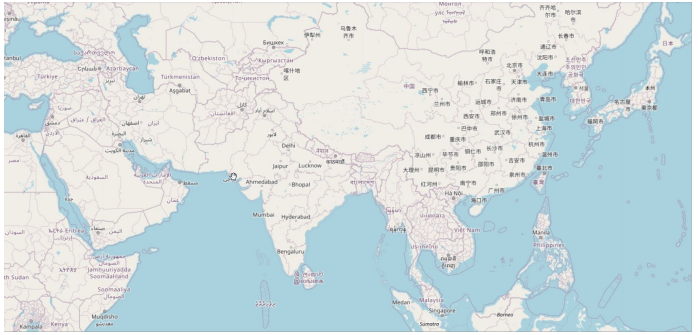
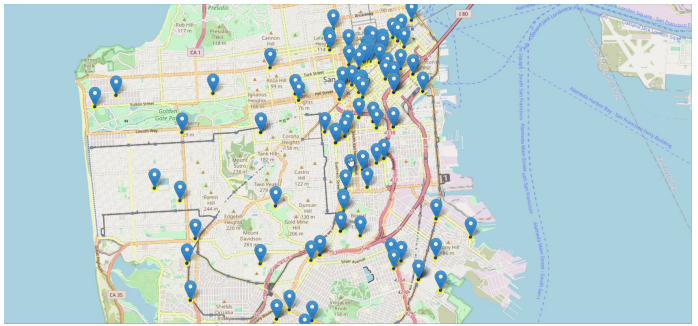


Introduction to Folium

- Folium is a Python library for visualizing geospatial data.
- Easy to use and very powerful
- Folium is a Python wrapper for Leaflet.js - a leading open-source JavaScript library for plotting interactive maps.
- It works efficiently, can be extended with a lot of plugins, has a beautiful and easy-to-use API





Demo

Head over to jupyter notebook: Map Making 101