Geospatial Vector Data Handling and Analysis using Python

IIRS Outreach Program | 49th Outreach Course
"Geoprocessing using Python" | July 22-26, 2019

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Python Package Index (pypi.org)

613 projects with the selected classifier   Order by [Trending ▾]

▼ TOPIC :: SCIENTIFIC/ENGINEERING :: GIS ✕

tilecloud-chain 1.12.3
Tools to generate tiles from WMS or Mapnik, to S3, Berkley DB, MBTiles, or local filesystem in WMTS layo…

pysal 2.0.0
A library of spatial analysis functions.

pygeoprocessing 1.7.0
PyGeoprocessing: Geoprocessing routines for GIS

geomet 0.2.0.post2
GeoJSON <-> WKT/WKB conversion utilities

pynmea2 1.15.0
Python library for the NMEA 0183 protcol

mapboxgl 0.10.2
MapboxGL plugin for Jupyter Notebooks

As on 22-July-2019
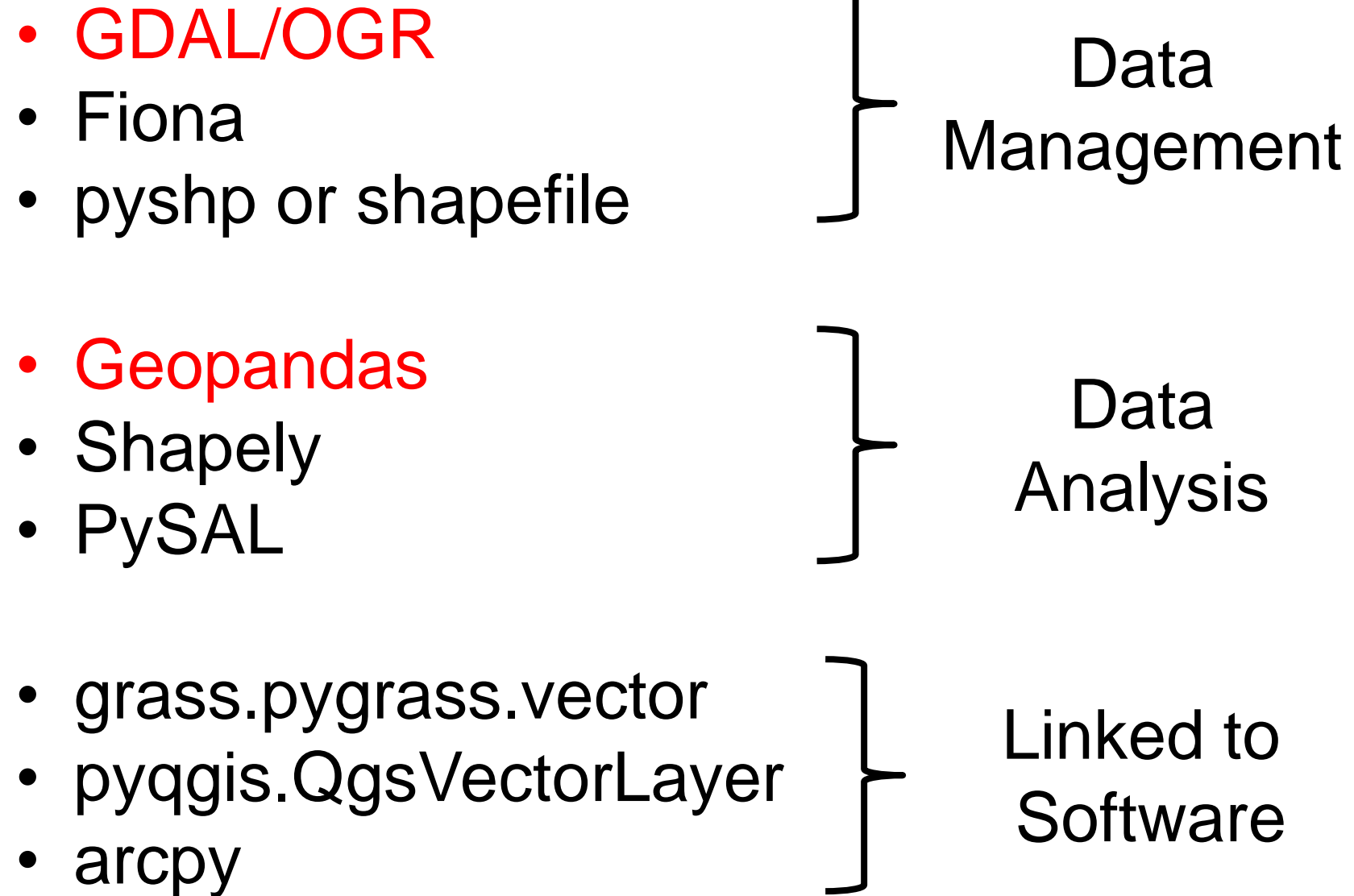
Vector Data Handling in Python

- GDAL/OGR
- Fiona
- pyshp or shapefile

- Geopandas
- Shapely
- PySAL

- grass.pygrass.vector
- pyqgis.QgsVectorLayer
- arcpy

Non Exhaustive!

Last release

- GDAL/OGR   Jul'19
- Fiona   Mar'19
- pyshp or shapefile   Feb'19

- Geopandas   Jul'19
- Shapely   Jun'19
- PySAL   Jan'19

- grass.pygrass.vector
- pyqgis.QgsVectorLayer   ⎫ Under Active
- arcpy   ⎭ Development

Purpose

- GDAL/OGR
- Fiona
- pyshp or shapefile

⎫ Data Management

- Geopandas
- Shapely
- PySAL

⎫ Data Analysis

- grass.pygrass.vector
- pyqgis.QgsVectorLayer
- arcpy

⎫ Linked to Software

Several more categories like Space-Time Analysis, GPS, Projections, Network Analysis, Mapping etc.

OGR

- OGR is a translator library for vector geospatial data formats, released under an Open Source license.

- Presents a single vector abstract data model to the calling application for all supported formats.

- Comes with a variety of useful command line utilities for data translation and processing.

History

- Launched in late 1998 by Frank Warmerdam
  - **Core Team:** Even Rouault, Howard Butler, Markus Neteler, and many more.

- URL: www.gdal.org

- Software using GDAL
  - Around 107 listed on the website [1]
  - Includes all popular software like ArcGIS, QGIS, Google Earth, GRASS GIS, IDRISI, ILWIS, SAGA, SkylineGlobe, Geoserver etc.

[1] https://gdal.org/software_using_gdal.html#software-using-gdal

Nyall Dawson
@nyalldawson

This is your periodic reminder that if @EvenRouault is ever hit by a bus, the **whole** spatial community is well and truely doomed 😱

2:30 AM · Jun 25, 2019 · Twitter for Android

12 Retweets   **55** Likes

Why OGR?

- Supports all known GIS file formats

- Supported vector formats (**95 drivers**[2]): ESRI Shapefile, ESRI ArcSDE, ESRI FileGDB, MapInfo (tab and mid/mif), GML, KML, PostGIS, Oracle Spatial, GeoPackage, ...
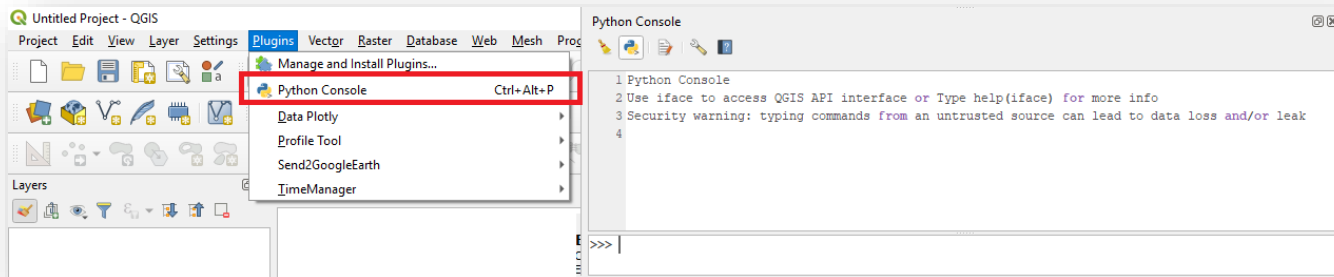
Getting hands dirty …

- Installing OGR is as simple as typing in Anaconda Prompt

  conda install gdal

- Assumptions:
  - Anaconda is your python distribution
  - It is updated (if not type **conda update --all**)

- Latest build (July 23, 2019) available on conda is GDAL-2.3.3 which requires Numpy 1.16.4 on Python 3.7.3

Warning!

- GDAL/OGR can be a nightmare in installation.

- PLEASE follow steps advised.

- **Last Resort:** If you are facing installation issues, suggest to run the OGR code in the Python console of QGIS.

GeoPandas [3]

- GeoPandas is an open source project to make working with geospatial data in python easier.

- GeoPandas extends the datatypes used by Pandas to allow spatial operations on geometric types.

- Geometric operations (shapely), file access (fiona) and plotting (descartes and matplotlib).

Installation

- Installing GeoPandas is as simple as typing in Anaconda Prompt

> **conda install geopandas**

- Assumptions:
  - Anaconda is your python distribution
  - It is updated (if not type **conda update --all**)

- Latest build (July 23, 2019) available on conda is geopandas-0.4.1 on Python 3.7.3

Classwork

- Hands dirty in Jupyter notebook

- URL with code & documentation

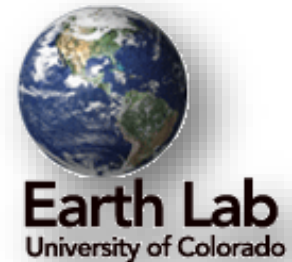 bit.ly/vector-python

- Type on Youtube comment box Yes/No for:
  – Did you download the slides/notebook?
  – Do you know GIS?
  – Do you know Python?

Credits

- Prof. Chris Garrard, Utah State University.

- Earth Lab, University of Colorado, Boulder.

- Data:
    - Natural Earth Data
    - Open Street Map
    - Datameet