Installing GeoPandas and Dependencies

Python libraries:
https://www.lfd.uci.edu/~gohlke/pythonlibs/#gdal

Anaconda Prompt (run as Administrator):

GeoPandas install:
conda install geopandas - worked

Descartes install:
conda install descartes - worked

Fiona install **FAILED**

Attempting to install **fiona** did not work and a continuous error occurred:
"ImportError: the 'read_file' function requires the 'fiona' package, but it is not installed or does not import correctly. Importing fiona resulted in: DLL load failed while importing ogrext: The specified module could not be found."

Tried: *pip uninstall wheel fiona* to uninstall "fiona-1.8.13.post1-py3.9.egg-info"

Tried: *conda install fiona-1.8.xxx*
Received error: "PackagesNotFoundError: The following packages are not available from current channels:
- fiona-1.8.19"

Tried .whl files:
*.whl files pulled from the following website: https://www.lfd.uci.edu/~gohlke/pythonlibs/#gdal

(base) C:\Users\TLukshaiDesktop>pip3 install Fiona-1.8.21-cp38-pypy38_pp73-win_amd64.whl
ERROR: Fiona-1.8.21-cp38-pypy38_pp73-win_amd64.whl is not a supported wheel on this platform.

(base) C:\Users\TLukshaiDesktop>pip install GDAL-3.4.3-cp311-cp311-win32.whl
ERROR: GDAL-3.4.3-cp311-cp311-win32.whl is not a supported wheel on this platform.

(base) C:\Users\TLukshaiDesktop>pip install GDAL-3.4.3-cp38-cp39y38_pp73-win_amd64.whl
ERROR: GDAL-3.4.3-cp38-pypy38_pp73-win_amd64.whl is not a supported wheel on this platform.

(base) C:\Users\TLukshaiDesktop>pip install Fiona-1.8.21-**cp38**-pypy38_pp73-win_amd64.whl
ERROR: Fiona-1.8.21-cp38-pypy38_pp73-win_amd64.whl is not a supported wheel on this platform.

I WAS USING THE WRONG .whl file version. I was using the PyPackage for 3.8 (...-pp38-...)

The following line was successful until the gdal dependency failed:
pip3 install Fiona-1.8.21-cp39-cp39-win_amd64.whl
Tried the following which appeared to run successfully:
(base) C:\Users\TLukshaiDesktop>*pip3 install GDAL-3.4.3-cp39-cp39-win_amd64.whl*

Retried the Fiona install and it ran successfully.

Moved to nexe successive error:
AttributeError: partially initialized module 'fiona' has no attribute '_loading' (most likely due to a circular import)

Complete code that creates this error (less indentation):
import geopandas as gpd

districts = gpd.read_file(r'C:\Users\TLukshaiDesktop\Python\geopandas_learning\GeoPandasTestingData\MSAGCommunity_Polygon.shp')

Resolve was: *conda remove geopandas* and *conda install geopandas*

Using "geopandas as gpd":

Great, simple tutorial:
https://www.youtube.com/watch?v=t7lliJXFt8w&t=10s

Plotting with gpd:
https://geopandas.org/en/stable/docs/reference/api/geopandas.GeoSeries.plot.html
Definition :

layer.plot(column=None, cmap=None, color=None, ax=None, cax=None, categorical=False, legend=False, scheme=None, k=5, vmin=None, vmax=None, markersize=None, figsize=None, legend_kwds=None, categories=None, classification_kwds=None, missing_kwds=None, aspect="auto", /, *, column=None, cmap=None, color=None, ax=None, cax=None, categorical=False, legend=False, scheme=None, k=5, vmin=None, vmax=None, markersize=None, figsize=None, legend_kwds=None, categories=None, classification_kwds=None, missing_kwds=None, aspect="auto", marker="o", **kwargs)

Color theme (cmap = 'brg'):
https://matplotlib.org/2.0.2/users/colormaps.html

Code:

```
import geopandas as gpd
import matplotlib.pyplot as plt

districts = gpd.read_file(r'C:\Users\TLuksha\Desktop\Python\geopandas_learning\GeoPandasTestingData\MSAGCommunity_Polygon.shp')
countyBoundary = gpd.read_file(r'C:\Users\TLuksha\Desktop\Python\geopandas_learning\GeoPandasTestingData\County_Boundary.shp')
structures = gpd.read_file(r'C:\Users\TLuksha\Desktop\Python\geopandas_learning\GeoPandasTestingData\Structures_08-18-2006.shp')
slimStructures = gpd.read_file(r'C:\Users\TLuksha\Desktop\Python\geopandas_learning\GeoPandasTestingData\slimSet.shp')
rcl = gpd.read_file(r'C:\Users\TLuksha\Desktop\Python\geopandas_learning\GeoPandasTestingData\RoadCenterlines.shp')
roadInfoPoints = gpd.read_file(r'C:\Users\TLuksha\Desktop\Python\geopandas_learning\GeoPandasTestingData\RoadInfoPoints.shp')
ssap = gpd.read_file(r'C:\Users\TLuksha\Desktop\Python\geopandas_learning\GeoPandasTestingData\SSAP.shp')

# Color map that is referenced in the 'cmap =' section below can be found at: https://matplotlib.org/2.0.2/users/colormaps.html
# districts.plot(cmap = 'Spectral', edgecolor = 'black', column = 'MSAGComm')
# structures.plot()
# countyBoundary.plot(color="none", edgecolor = 'black')

# Plot the figures side by side
# fig, (ax1, ax2) = plt.subplots(ncols = 2, figsize = (10,8))
# districts.plot(ax = ax1, cmap = 'Spectral', edgecolor = 'black', column = 'MSAGComm')
# countyBoundary.plot(ax = ax2, color="none", edgecolor = 'black')

# Plotting multiple layers
fig, ax = plt.subplots(figsize = (20,15)) # figsize=(width,height)
https://www.geeksforgeeks.org/how-to-change-the-size-of-figures-drawn-with-matplotlib/#:~:text=pyplot,-Syntax%3A&text=The%20figsize%20attribute%20is%20a,not%20mentioned%20in%20the%20function.

# districts.plot(ax = ax, cmap = 'Spectral', edgecolor = 'black', column = 'MSAGComm') # https://geopandas.org/en/stable/docs/reference/api/geopandas.GeoSeries.plot.html
plt.title('Madison County', fontsize = 50, verticalalignment = 'baseline', horizontalalignment = 'center', loc = 'center', pad = 25)
countyBoundary.plot(ax = ax, color="none", edgecolor = 'black', linewidth = 3, zorder=1)
rcl.plot(column = 'RoadClass', cmap = 'jet', ax = ax, edgecolor = 'black', linewidth = 2, zorder=2)
rcl.plot(column='RoadClass', cmap='brg', color=None, ax=ax, cax=(1,1), categorical=True, legend=False, scheme=None, k=5, vmin=None, vmax=None, markersize=None, figsize=None, legend_kwds=None, categories=None, zorder=3)
# roadInfoPoints.plot(ax = ax, color='black', markersize = 16)
# slimStructures.plot(ax = ax, color = 'red', markersize = 45)
ssap.plot(ax = ax, color = 'green', markersize = 25, zorder=5)

# Reprojecting GeoPandas GeoDataFrames to EPSG: 32629 **** DOES NOT WORK CORRECTLY **** - I am not sure why at this point and I don't have time to research.
# print(countyBoundary.crs)
# countyBoundary = countyBoundary.to_crs(epsg=32629)
# countyBoundary.plot(figsize = (10,15))


'''LATER VERSION'''

# -*- coding: utf-8 -*-
"""
Created on Mon Oct  3 07:35:48 2022

@author: TLuksha
"""
import geopandas as gpd
import matplotlib.pyplot as plt
from fpdf import FPDF

def plottingMyData():
    districts = gpd.read_file(r'C:\Users\TLuksha\Desktop\Python\geopandas_learning\GeoPandasTestingData\MSAGCommunity_Polygon.shp')
    countyBoundary = gpd.read_file(r'C:\Users\TLuksha\Desktop\Python\geopandas_learning\GeoPandasTestingData\County_Boundary.shp')
    structures = gpd.read_file(r'C:\Users\TLuksha\Desktop\Python\geopandas_learning\GeoPandasTestingData\Structures_08-18-2006.shp')
    slimStructures = gpd.read_file(r'C:\Users\TLuksha\Desktop\Python\geopandas_learning\GeoPandasTestingData\slimSet.shp')
    rcl = gpd.read_file(r'C:\Users\TLuksha\Desktop\Python\geopandas_learning\GeoPandasTestingData\RoadCenterlines.shp')
    roadInfoPoints = gpd.read_file(r'C:\Users\TLuksha\Desktop\Python\geopandas_learning\GeoPandasTestingData\RoadInfoPoints.shp')
    ssap = gpd.read_file(r'C:\Users\TLuksha\Desktop\Python\geopandas_learning\GeoPandasTestingData\SSAP.shp')

    # Color map that is referenced in the 'cmap =' section below can be found at: https://matplotlib.org/2.0.2/users/colormaps.html
    # districts.plot(cmap = 'Spectral', edgecolor = 'black', column = 'MSAGComm')
    # structures.plot()
    # countyBoundary.plot(color="none", edgecolor = 'black')

    # Plot the figures side by side
    # fig, (ax1, ax2) = plt.subplots(ncols = 2, figsize = (10,8))
    # districts.plot(ax = ax1, cmap = 'Spectral', edgecolor = 'black', column = 'MSAGComm')
    # countyBoundary.plot(ax = ax2, color="none", edgecolor = 'black')



    # Plotting multiple layers
    fig, (ax1, ax2) = plt.subplots(ncols=2, figsize = (20,15)) # figsize=(width,height)
https://www.geeksforgeeks.org/how-to-change-the-size-of-figures-drawn-with-matplotlib/#:~:text=pyplot,-Syntax%3A&text=The%20figsize%20attribute%20is%20a,not%20mentioned%20in%20the%20function.

    districts.plot(ax = ax1, cmap = 'Spectral', edgecolor = 'black', column = 'MSAGComm', legend=True) # https://geopandas.org/en/stable/docs/reference/api/geopandas.GeoSeries.plot.html
    plt.title('Madison County', fontsize = 50, verticalalignment = 'baseline', horizontalalignment = 'center', loc = 'center', pad = 25)
    countyBoundary.plot(ax = ax1, color="none", edgecolor = 'black', linewidth = 3, zorder=1)
    structures.plot(column='structures', markersize = 25, ax=ax1, legend=True) # geopandas cannot handle the data load on this particular full list of structures.
    plt.legend(bbox_to_anchor=(1.05, 1), loc='lower left', borderaxespad=0)

    countyBoundary.plot(ax = ax2, color="none", edgecolor = 'black', linewidth = 3, zorder=1)
    # rcl.plot(column = 'RoadClass', cmap = 'jet', ax = ax, edgecolor = 'black', linewidth = 2, zorder=2)
    rcl.plot(column='RoadClass', cmap='brg', color=None, ax=ax2, cax=(1,1), categorical=True, legend=True, scheme=None, k=5, vmin=None, vmax=None, markersize=None, figsize=None, legend_kwds=None,
categories=None, zorder=3)
    # roadInfoPoints.plot(ax = ax, color='black', markersize = 16)
    # slimStructures.plot(ax = ax, color = 'red', markersize = 45)
    ssap.plot(ax = ax1, color = 'green', markersize = 25, zorder=5, legend = True)
    plt.legend()
    plt.grid(True)
    plt.savefig('My_Second_gpd_Map_Export.pdf')

plottingMyData()

''' CREATE PDF FROM RESULTS'''
width = 210
height = 297
day = '10/5/2022'
```

```
def create_title(day, pdf):
  # Unicode is not yet supported in the py3k version; use windows-1252 standard font
  pdf.set_font('Arial', '', 24)
  pdf.ln(60)
  pdf.write(5, f"Covid Analytics Report")
  pdf.ln(10)
  pdf.set_font('Arial', '', 16)
  pdf.write(4, f'{day}')
  pdf.ln(5)

def create_report(day, filename = 'tutorial3.pdf'):
    pdf = FPDF()
    '''First page'''
    pdf.add_page()
    pdf.image('first_map_with_geopandas.png', 10, 10, width, height)

# Reprojecting GeoPandas GeoDataFrames to EPSG: 32629 ****DOES NOT WORK RIGHT****
# print(countyBoundary.crs)
# countyBoundary = countyBoundary.to_crs(epsg=32629)
# countyBoundary.plot(figsize = (10,15))
```

Code Information / Lessons Learned:
Either geopandas or Spyder cannot display the structures dataset in full.

Questions:

How do we get the geopandas plot output to a PDF?
plt.savefig("filename.ext")

Why can't geopandas display 9,654 points?

```
structures = gpd.read_file(r'C:\Users\TLuksha\Desktop\Python\geopandas_learning\GeoPandasTestingData\Structures_08-18-2006.shp')
# structures.plot(column='structures', color = 'green', markersize = 25, ax=ax1, legend=True) # geopandas cannot handle the data load on this particular full list of structures.
```

If gpd can't display that many points, can it select from them at least?

File "C:\Users\TLuksha\Desktop\Python\geopandas_learning\AnAbsoluteBeginnersGuideToPythonGeoPandas.py", line 38, in plottingMyData
structures.plot(column='structures', markersize = 25, ax=ax1, legend=True) # geopandas cannot handle the data load on this particular full list of structures.