milestone4

June 19, 2022

[1]:
```
import pandas as pd
from sqlalchemy import create_engine
```

[18]:
```
from sklearn.ensemble import RandomForestRegressor
from sklearn.multioutput import MultiOutputClassifier
from sklearn.pipeline import Pipeline
import pickle
from sklearn.model_selection import train_test_split
from sklearn.model_selection import GridSearchCV
from sklearn.metrics import confusion_matrix
from sklearn import metrics
import numpy as np
```

[3]:
```
#check sqlalchemy
import sqlalchemy
print (sqlalchemy.__version__ )
```

```
1.4.22
```

[53]:
```
#load data from database
def load_data():
    engine = create_engine('sqlite:///casas.db')
    df = pd.read_sql("SELECT * FROM casas", engine)
    X = df[['apartments', 'houses','areas_sqm', 'quartos','Latitude',␣
 ↪'Longitude', 'CodPostal', 'Cod_Condition', 'T0', 'T1', 'T2', 'T3', 'T4',␣
 ↪'T5', 'T6']]
    y = df[['Price']]
    return X, y
```

[54]:
```
#call function
X,y = load_data()
```

[55]:
```
X.head()
```

[55]:
```
   apartments  houses  areas_sqm  quartos  Latitude  Longitude  CodPostal  \
0           1       0         96        2   40.6175  -8.647778       3810
1           1       0        119        2   40.6175  -8.647778       3810
2           1       0         72        2   40.6175  -8.647778       3810
3           1       0         90        2   40.6175  -8.647778       3810
```

```
4           1        0         126         2   40.6175  -8.647778       3810

   Cod_Condition  T0  T1  T2  T3  T4  T5  T6
0              4   0   0   1   0   0   0   0
1              4   0   0   1   0   0   0   0
2              4   0   0   1   0   0   0   0
3              4   0   0   1   0   0   0   0
4              6   0   0   1   0   0   0   0
```

[56]:

```
y.head()
```

[56]:

```
    Price
0  145000
1  155000
2  118000
3  185000
4  295000
```

[7]:

```
X.shape, y.shape
```

[7]:

```
((4180, 15), (4180, 1))
```

[8]:

```
#split data
X_train, X_test, y_train, y_test = train_test_split(X,y,test_size=0.3,␣
 ↪random_state=42)
```

0.0.1 Substituir pelo modelo correto

[9]:

```
pipeline=Pipeline([
    ('clf',RandomForestRegressor())
])
```

[31]:

```
pipeline.get_params().keys()
```

[31]:

```
dict_keys(['memory', 'steps', 'verbose', 'clf', 'clf__bootstrap',
'clf__ccp_alpha', 'clf__criterion', 'clf__max_depth', 'clf__max_features',
'clf__max_leaf_nodes', 'clf__max_samples', 'clf__min_impurity_decrease',
'clf__min_impurity_split', 'clf__min_samples_leaf', 'clf__min_samples_split',
'clf__min_weight_fraction_leaf', 'clf__n_estimators', 'clf__n_jobs',
'clf__oob_score', 'clf__random_state', 'clf__verbose', 'clf__warm_start'])
```

[10]:

```
#choose parameters
parameters = {
     "clf__n_estimators": [10, 50, 100]
}
```

[11]:

```
# use GridSearchCV
cv = GridSearchCV(pipeline, param_grid=parameters, verbose=1)
```

[12]:

```
#fit model
model=cv.fit(X_train, y_train)
```

```
Fitting 5 folds for each of 3 candidates, totalling 15 fits
```

```
/Users/anateresaneto/opt/miniconda3/envs/my_env/lib/python3.9/site-
packages/sklearn/pipeline.py:346: DataConversionWarning: A column-vector y was
passed when a 1d array was expected. Please change the shape of y to
(n_samples,), for example using ravel().
  self._final_estimator.fit(Xt, y, **fit_params_last_step)
/Users/anateresaneto/opt/miniconda3/envs/my_env/lib/python3.9/site-
packages/sklearn/pipeline.py:346: DataConversionWarning: A column-vector y was
passed when a 1d array was expected. Please change the shape of y to
(n_samples,), for example using ravel().
  self._final_estimator.fit(Xt, y, **fit_params_last_step)
/Users/anateresaneto/opt/miniconda3/envs/my_env/lib/python3.9/site-
packages/sklearn/pipeline.py:346: DataConversionWarning: A column-vector y was
passed when a 1d array was expected. Please change the shape of y to
(n_samples,), for example using ravel().
  self._final_estimator.fit(Xt, y, **fit_params_last_step)
/Users/anateresaneto/opt/miniconda3/envs/my_env/lib/python3.9/site-
packages/sklearn/pipeline.py:346: DataConversionWarning: A column-vector y was
passed when a 1d array was expected. Please change the shape of y to
(n_samples,), for example using ravel().
  self._final_estimator.fit(Xt, y, **fit_params_last_step)
/Users/anateresaneto/opt/miniconda3/envs/my_env/lib/python3.9/site-
packages/sklearn/pipeline.py:346: DataConversionWarning: A column-vector y was
passed when a 1d array was expected. Please change the shape of y to
(n_samples,), for example using ravel().
  self._final_estimator.fit(Xt, y, **fit_params_last_step)
/Users/anateresaneto/opt/miniconda3/envs/my_env/lib/python3.9/site-
packages/sklearn/pipeline.py:346: DataConversionWarning: A column-vector y was
passed when a 1d array was expected. Please change the shape of y to
(n_samples,), for example using ravel().
  self._final_estimator.fit(Xt, y, **fit_params_last_step)
/Users/anateresaneto/opt/miniconda3/envs/my_env/lib/python3.9/site-
packages/sklearn/pipeline.py:346: DataConversionWarning: A column-vector y was
passed when a 1d array was expected. Please change the shape of y to
(n_samples,), for example using ravel().
  self._final_estimator.fit(Xt, y, **fit_params_last_step)
/Users/anateresaneto/opt/miniconda3/envs/my_env/lib/python3.9/site-
packages/sklearn/pipeline.py:346: DataConversionWarning: A column-vector y was
passed when a 1d array was expected. Please change the shape of y to
(n_samples,), for example using ravel().
  self._final_estimator.fit(Xt, y, **fit_params_last_step)
/Users/anateresaneto/opt/miniconda3/envs/my_env/lib/python3.9/site-
packages/sklearn/pipeline.py:346: DataConversionWarning: A column-vector y was
passed when a 1d array was expected. Please change the shape of y to
(n_samples,), for example using ravel().
  self._final_estimator.fit(Xt, y, **fit_params_last_step)
/Users/anateresaneto/opt/miniconda3/envs/my_env/lib/python3.9/site-
```

```
packages/sklearn/pipeline.py:346: DataConversionWarning: A column-vector y was
passed when a 1d array was expected. Please change the shape of y to
(n_samples,), for example using ravel().
  self._final_estimator.fit(Xt, y, **fit_params_last_step)
/Users/anateresaneto/opt/miniconda3/envs/my_env/lib/python3.9/site-
packages/sklearn/pipeline.py:346: DataConversionWarning: A column-vector y was
passed when a 1d array was expected. Please change the shape of y to
(n_samples,), for example using ravel().
  self._final_estimator.fit(Xt, y, **fit_params_last_step)
/Users/anateresaneto/opt/miniconda3/envs/my_env/lib/python3.9/site-
packages/sklearn/pipeline.py:346: DataConversionWarning: A column-vector y was
passed when a 1d array was expected. Please change the shape of y to
(n_samples,), for example using ravel().
  self._final_estimator.fit(Xt, y, **fit_params_last_step)
/Users/anateresaneto/opt/miniconda3/envs/my_env/lib/python3.9/site-
packages/sklearn/pipeline.py:346: DataConversionWarning: A column-vector y was
passed when a 1d array was expected. Please change the shape of y to
(n_samples,), for example using ravel().
  self._final_estimator.fit(Xt, y, **fit_params_last_step)
/Users/anateresaneto/opt/miniconda3/envs/my_env/lib/python3.9/site-
packages/sklearn/pipeline.py:346: DataConversionWarning: A column-vector y was
passed when a 1d array was expected. Please change the shape of y to
(n_samples,), for example using ravel().
  self._final_estimator.fit(Xt, y, **fit_params_last_step)
/Users/anateresaneto/opt/miniconda3/envs/my_env/lib/python3.9/site-
packages/sklearn/pipeline.py:346: DataConversionWarning: A column-vector y was
passed when a 1d array was expected. Please change the shape of y to
(n_samples,), for example using ravel().
  self._final_estimator.fit(Xt, y, **fit_params_last_step)
/Users/anateresaneto/opt/miniconda3/envs/my_env/lib/python3.9/site-
packages/sklearn/pipeline.py:346: DataConversionWarning: A column-vector y was
passed when a 1d array was expected. Please change the shape of y to
(n_samples,), for example using ravel().
  self._final_estimator.fit(Xt, y, **fit_params_last_step)
```

[13]:

```
#predict
y_pred=model.predict(X_test)
```

[27]:

```
def build_model():
    pipeline = Pipeline([
    ('clf',MultiOutputClassifier(RandomForestRegressor()))
])
    parameters = {
        'clf__estimator__n_estimators':[50, 100, 150]
    }
    #create grid_search
    cv = GridSearchCV(pipeline, param_grid = parameters, verbose = 1)
    return cv
```

[28]:

```
model = build_model()
```

[29]:

```
print('MAE:', metrics.mean_absolute_error(y_test, y_pred))
print('MSE:', metrics.mean_squared_error(y_test, y_pred))
print('RMSE:', np.sqrt(metrics.mean_squared_error(y_test, y_pred)))
print('VarScore:',metrics.explained_variance_score(y_test,y_pred))
```

```
MAE: 45821.41872795983
MSE: 7166046811.822071
RMSE: 84652.50623473631
VarScore: 0.5834095873470151
```

[51]:

```
file = 'casas.pkl'
pickle.dump(model, open(file, 'wb'))
```

[ ]:

```
# desenvolver o mapa
```

[34]:

```
import numpy as np # library to handle data in a vectorized manner

import pandas as pd # library for data analsysis
pd.set_option('display.max_columns', None)
pd.set_option('display.max_rows', None)

import json # library to handle JSON files

# tranforming json file into a pandas dataframe library
from pandas.io.json import json_normalize

#!conda install -c conda-forge geopy --yes # uncomment this line if you haven't␣
 ↪completed the Foursquare API lab
#from geopy.geocoders import Nominatim # convert an address into latitude and␣
 ↪longitude values

import requests # library to handle requests
from pandas.io.json import json_normalize # tranform JSON file into a pandas␣
 ↪dataframe

# Matplotlib and associated plotting modules
import matplotlib.cm as cm
import matplotlib.colors as colors

# import k-means from clustering stage
from sklearn.cluster import KMeans

#!conda install -c conda-forge folium=0.5.0 --yes
import folium # map rendering library
```

```
print('Libraries imported.')
```

```
Libraries imported.
```

[35]:
```
!pip install shapely
import shapely.geometry

!pip install pyproj
import pyproj

import math

def lonlat_to_xy(lon, lat):
    proj_latlon = pyproj.Proj(proj='latlong',datum='WGS84')
    proj_xy = pyproj.Proj(proj="utm", zone=33, datum='WGS84')
    xy = pyproj.transform(proj_latlon, proj_xy, lon, lat)
    return xy[0], xy[1]

def xy_to_lonlat(x, y):
    proj_latlon = pyproj.Proj(proj='latlong',datum='WGS84')
    proj_xy = pyproj.Proj(proj="utm", zone=33, datum='WGS84')
    lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
    return lonlat[0], lonlat[1]

def calc_xy_distance(x1, y1, x2, y2):
    dx = x2 - x1
    dy = y2 - y1
    return math.sqrt(dx*dx + dy*dy)
```

```
Collecting shapely
  Downloading Shapely-1.8.2-cp39-cp39-macosx_10_9_x86_64.whl (1.2 MB)
     || 1.2 MB 4.1 MB/s eta 0:00:01
Installing collected packages: shapely
Successfully installed shapely-1.8.2
Collecting pyproj
  Downloading pyproj-3.3.1-cp39-cp39-macosx_10_9_x86_64.whl (8.2 MB)
     || 8.2 MB 4.4 MB/s eta 0:00:01
Requirement already satisfied: certifi in
./opt/miniconda3/envs/my_env/lib/python3.9/site-packages (from pyproj)
(2022.6.15)
Installing collected packages: pyproj
Successfully installed pyproj-3.3.1
```

[36]:
```
aveiro_center = 40.6410163 ,-8.653466
address = 'Forum Aveiro'
print('Coordinate of {}: {}'.format(address, aveiro_center))
```

```
Coordinate of Forum Aveiro: (40.6410163, -8.653466)
```

[40]:

```
aveiro_center_x, aveiro_center_y = lonlat_to_xy(aveiro_center[1],␣
 ↪aveiro_center[0]) # City center in Cartesian coordinates

k = math.sqrt(3) / 2 # Vertical offset for hexagonal grid cells
x_min = aveiro_center_x - 3000
x_step = 300
y_min = aveiro_center_y - 3000 - (int(21/k)*k*300 - 6000)/2
y_step = 300 * k

latitudes = []
longitudes = []
distances_from_center = []
xs = []
ys = []
for i in range(0, int(21/k)):
    y = y_min + i * y_step
    x_offset = 150 if i%2==0 else 0
    for j in range(0, 21):
        x = x_min + j * x_step + x_offset
        distance_from_center = calc_xy_distance(aveiro_center_x,␣
 ↪aveiro_center_y, x, y)
        if (distance_from_center <= 3001):
            lon, lat = xy_to_lonlat(x, y)
            latitudes.append(lat)
            longitudes.append(lon)
            distances_from_center.append(distance_from_center)
            xs.append(x)
            ys.append(y)

print(len(latitudes), 'candidate neighborhood centers generated.')
```

```
<ipython-input-35-88702e7652dd>:12: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  xy = pyproj.transform(proj_latlon, proj_xy, lon, lat)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
```

```
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)

364 candidate neighborhood centers generated.
```

```
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
<ipython-input-35-88702e7652dd>:18: DeprecationWarning: This function is
deprecated. See: https://pyproj4.github.io/pyproj/stable/gotchas.html#upgrading-
to-pyproj-2-from-pyproj-1
  lonlat = pyproj.transform(proj_xy, proj_latlon, x, y)
```

[42]:

```
map_aveiro = folium.Map(location=aveiro_center, zoom_start=13)
folium.Marker(aveiro_center, popup='Forum Aveiro').add_to(map_aveiro)
for lat, lon in zip(latitudes, longitudes):
    #folium.CircleMarker([lat, lon], radius=2, color='blue', fill=True,␣
 ↪fill_color='blue', fill_opacity=1).add_to(map_lisbon)
    folium.Circle([lat, lon], radius=150, color='blue', fill=False).
 ↪add_to(map_aveiro)
    #folium.Marker([lat, lon]).add_to(map_lisbon)
map_aveiro
```

[42]:

```
<folium.folium.Map at 0x7fa6c21c6550>
```

[45]:

```
# instantiate a feature group for the X, Y in the dataframe Theatres
casas = folium.map.FeatureGroup()

# loop through the theatres and add each to the theatres feature group
for lat, lng, in zip(X.Latitude, X.Longitude):
    casas.add_child(
        folium.features.CircleMarker(
            [lat, lng],
            radius=10, #  circle markers
            color='red',
            fill=True,
            fill_color='yellow',
            fill_opacity=0.6
        )
    )

# add incidents to map
map_aveiro.add_child(casas)
```

[45]:

```
<folium.folium.Map at 0x7fa6c21c6550>
```

[59]:

```
# instantiate a feature group for the theatres in the dataframe
casas = folium.map.FeatureGroup()

# loop through the casas and add each to the casas feature group
for lat, lng, in zip(X.Latitude, X.Longitude):
    casas.add_child(
        folium.features.CircleMarker(
            [lat, lng],
            radius=10, #  circle markers
            color='red',
            fill=True,
            fill_color='yellow',
            fill_opacity=0.6
        )
    )


# add pop-up text to each marker on the map
latitudes = list(X.Latitude)
longitudes = list(X.Longitude)
labels = list(X.apartments)

for lat, lng, label in zip(latitudes, longitudes, labels):
    folium.Marker([lat, lng], popup=label).add_to(map_aveiro)


# add incidents to map
map_aveiro.add_child(casas)
```

[59]:

```
<folium.folium.Map at 0x7fa6c21c6550>
```

[ ]: