In [2]:
```
pip install folium
```

```
Collecting folium
  Obtaining dependency information for folium from https://files.pythonhosted.org/packages/b9/98/9ba4b9d2d07dd32765ddb4e4c
189dcbdd7dca4d5a735e2e4ea756f40c36b/folium-0.16.0-py2.py3-none-any.whl.metadata
  Downloading folium-0.16.0-py2.py3-none-any.whl.metadata (3.6 kB)
Collecting branca>=0.6.0 (from folium)
  Obtaining dependency information for branca>=0.6.0 from https://files.pythonhosted.org/packages/75/ca/6074ab4a04dd1a5032
01c18091b3426f3709670115fae316907a97f98d75/branca-0.7.2-py3-none-any.whl.metadata
  Downloading branca-0.7.2-py3-none-any.whl.metadata (1.5 kB)
Requirement already satisfied: jinja2>=2.9 in c:\users\sandra\anaconda3\lib\site-packages (from folium) (3.1.2)
Requirement already satisfied: numpy in c:\users\sandra\anaconda3\lib\site-packages (from folium) (1.24.3)
Requirement already satisfied: requests in c:\users\sandra\anaconda3\lib\site-packages (from folium) (2.31.0)
Requirement already satisfied: xyzservices in c:\users\sandra\anaconda3\lib\site-packages (from folium) (2022.9.0)
Requirement already satisfied: MarkupSafe>=2.0 in c:\users\sandra\anaconda3\lib\site-packages (from jinja2>=2.9->folium)
(2.1.1)
Requirement already satisfied: charset-normalizer<4,>=2 in c:\users\sandra\anaconda3\lib\site-packages (from requests->fol
ium) (2.0.4)
Requirement already satisfied: idna<4,>=2.5 in c:\users\sandra\anaconda3\lib\site-packages (from requests->folium) (3.4)
Requirement already satisfied: urllib3<3,>=1.21.1 in c:\users\sandra\anaconda3\lib\site-packages (from requests->folium)
(1.26.16)
Requirement already satisfied: certifi>=2017.4.17 in c:\users\sandra\anaconda3\lib\site-packages (from requests->folium)
(2023.7.22)
Downloading folium-0.16.0-py2.py3-none-any.whl (100 kB)
   ---------------------------------------- 0.0/100.0 kB ? eta -:--:--
   ---------- -------------------------- 30.7/100.0 kB 660.6 kB/s eta 0:00:01
   ---------------------------------------- 100.0/100.0 kB 2.0 MB/s eta 0:00:00
Downloading branca-0.7.2-py3-none-any.whl (25 kB)
Installing collected packages: branca, folium
Successfully installed branca-0.7.2 folium-0.16.0
Note: you may need to restart the kernel to use updated packages.
```

In [2]:
```
pip install pandas geopandas shapely
```

```
  Cell In[2], line 1
    pip install pandas geopandas shapely
        ^
SyntaxError: invalid syntax
```

In [4]:
```
pip install folium matplotlib mapclassify
```

```
Requirement already satisfied: folium in c:\users\sandra\anaconda3\lib\site-packages (0.16.0)
Requirement already satisfied: matplotlib in c:\users\sandra\anaconda3\lib\site-packages (3.7.2)
Requirement already satisfied: mapclassify in c:\users\sandra\anaconda3\lib\site-packages (2.6.1)
Requirement already satisfied: branca>=0.6.0 in c:\users\sandra\anaconda3\lib\site-packages (from folium) (0.7.2)
Requirement already satisfied: jinja2>=2.9 in c:\users\sandra\anaconda3\lib\site-packages (from folium) (3.1.2)
Requirement already satisfied: numpy in c:\users\sandra\anaconda3\lib\site-packages (from folium) (1.24.3)
Requirement already satisfied: requests in c:\users\sandra\anaconda3\lib\site-packages (from folium) (2.31.0)
Requirement already satisfied: xyzservices in c:\users\sandra\anaconda3\lib\site-packages (from folium) (2022.9.0)
Requirement already satisfied: contourpy>=1.0.1 in c:\users\sandra\anaconda3\lib\site-packages (from matplotlib) (1.0.5)
Requirement already satisfied: cycler>=0.10 in c:\users\sandra\anaconda3\lib\site-packages (from matplotlib) (0.11.0)
Requirement already satisfied: fonttools>=4.22.0 in c:\users\sandra\anaconda3\lib\site-packages (from matplotlib) (4.25.0)
Requirement already satisfied: kiwisolver>=1.0.1 in c:\users\sandra\anaconda3\lib\site-packages (from matplotlib) (1.4.4)
Requirement already satisfied: packaging>=20.0 in c:\users\sandra\anaconda3\lib\site-packages (from matplotlib) (23.1)
Requirement already satisfied: pillow>=6.2.0 in c:\users\sandra\anaconda3\lib\site-packages (from matplotlib) (9.4.0)
Requirement already satisfied: pyparsing<3.1,>=2.3.1 in c:\users\sandra\anaconda3\lib\site-packages (from matplotlib) (3.
0.9)
Requirement already satisfied: python-dateutil>=2.7 in c:\users\sandra\anaconda3\lib\site-packages (from matplotlib) (2.8.
2)
Requirement already satisfied: networkx>=2.7 in c:\users\sandra\anaconda3\lib\site-packages (from mapclassify) (3.1)
Requirement already satisfied: pandas!=1.5.0,>=1.4 in c:\users\sandra\anaconda3\lib\site-packages (from mapclassify) (2.0.
3)
Requirement already satisfied: scikit-learn>=1.0 in c:\users\sandra\anaconda3\lib\site-packages (from mapclassify) (1.3.0)
Requirement already satisfied: scipy>=1.8 in c:\users\sandra\anaconda3\lib\site-packages (from mapclassify) (1.11.1)
Requirement already satisfied: MarkupSafe>=2.0 in c:\users\sandra\anaconda3\lib\site-packages (from jinja2>=2.9->folium)
(2.1.1)
Requirement already satisfied: pytz>=2020.1 in c:\users\sandra\anaconda3\lib\site-packages (from pandas!=1.5.0,>=1.4->mapc
lassify) (2023.3.post1)
Requirement already satisfied: tzdata>=2022.1 in c:\users\sandra\anaconda3\lib\site-packages (from pandas!=1.5.0,>=1.4->ma
pclassify) (2023.3)
Requirement already satisfied: six>=1.5 in c:\users\sandra\anaconda3\lib\site-packages (from python-dateutil>=2.7->matplot
lib) (1.16.0)
Requirement already satisfied: joblib>=1.1.1 in c:\users\sandra\anaconda3\lib\site-packages (from scikit-learn>=1.0->mapcl
assify) (1.2.0)
Requirement already satisfied: threadpoolctl>=2.0.0 in c:\users\sandra\anaconda3\lib\site-packages (from scikit-learn>=1.0
->mapclassify) (2.2.0)
Requirement already satisfied: charset-normalizer<4,>=2 in c:\users\sandra\anaconda3\lib\site-packages (from requests->fol
ium) (2.0.4)
Requirement already satisfied: idna<4,>=2.5 in c:\users\sandra\anaconda3\lib\site-packages (from requests->folium) (3.4)
Requirement already satisfied: urllib3<3,>=1.21.1 in c:\users\sandra\anaconda3\lib\site-packages (from requests->folium)
(1.26.16)
Requirement already satisfied: certifi>=2017.4.17 in c:\users\sandra\anaconda3\lib\site-packages (from requests->folium)
(2023.7.22)
Note: you may need to restart the kernel to use updated packages.
```

In [6]:

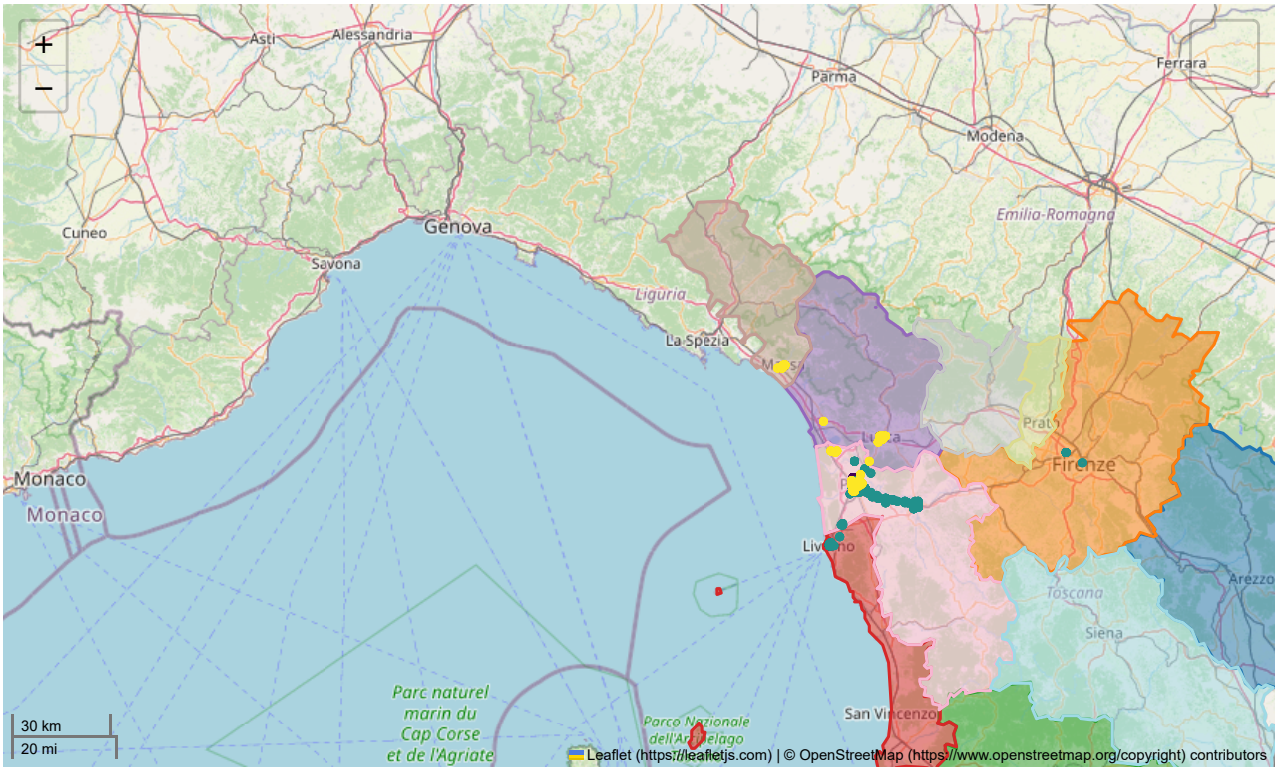
```python
import geopandas
import geodatasets
import pandas as pd
from shapely import wkb

chicago = geopandas.read_file("gadm41_ITA_2.shp")
print(chicago.columns)
filtered_gdf = chicago[chicago['NAME_1'] == 'Toscana']
chicago2 = geopandas.read_file("gadm41_ITA_1.shp")
groceries = geopandas.read_file(geodatasets.get_path("geoda.groceries")).explode(ignore_index=True)

# Load CSV into DataFrame
csv_data = pd.read_csv('context_dataset_stage.csv')

# Create geometry column from latitude and longitude
#csv_data['geometry'] = csv_data.apply(lambda row: Point(row['longitude'], row['latitude']), axis=1)
csv_data['geometry'] = csv_data['posicao_it'].apply(wkb.loads)
# Convert DataFrame to GeoDataFrame
gdf_csv = geopandas.GeoDataFrame(csv_data, geometry='geometry')

# Set the Coordinate Reference System (CRS) to WGS84
gdf_csv.set_crs(epsg=4326, inplace=True)

import folium

print(chicago.columns)
m = filtered_gdf.explore(
    column="NAME_2",  # make choropleth based on "POP2010" column
    scheme="naturalbreaks",  # use mapclassify's natural breaks scheme
    legend=False,  # show legend
    k=10,  # use 10 bins
    tooltip=False,  # hide tooltip
    #popup=["POP2010", "POP2000"],  # show popup (on-click)
    legend_kwds=dict(colorbar=False),  # do not use colorbar
    name="freguesias",  # name of the layer in the map
)
```

```
# chicago2.explore(
#     m=m,
#     column="NAME_1",  # make choropleth based on "POP2010" column
#     scheme="naturalbreaks",  # use mapclassify's natural breaks scheme
#     legend=False,  # show legend
#     k=10,  # use 10 bins
#     tooltip=False,  # hide tooltip
#     #popup=["POP2010", "POP2000"],  # show popup (on-click)
#     legend_kwds=dict(colorbar=False),  # do not use colorbar
#     name="cidades",  # name of the layer in the map
# )
print(gdf_csv.columns)
gdf_csv.explore(
    m=m,
    column="uid",  # make choropleth based on "POP2010" column
    scheme="naturalbreaks",  # use mapclassify's natural breaks scheme
    legend=False,  # show legend
    k=10,  # use 10 bins
    tooltip=False,  # hide tooltip
    #popup=["POP2010", "POP2000"],  # show popup (on-click)
    legend_kwds=dict(colorbar=False),  # do not use colorbar
    name="pontos",  # name of the layer in the map
)

folium.TileLayer("CartoDB positron", show=False).add_to(
    m
)  # use folium to add alternative tiles
folium.LayerControl().add_to(m)  # use folium to add layer control

m  # show map
```

```
Index(['GID_2', 'GID_0', 'COUNTRY', 'GID_1', 'NAME_1', 'NL_NAME_1', 'NAME_2',
       'VARNAME_2', 'NL_NAME_2', 'TYPE_2', 'ENGTYPE_2', 'CC_2', 'HASC_2',
       'geometry'],
      dtype='object')
Index(['GID_2', 'GID_0', 'COUNTRY', 'GID_1', 'NAME_1', 'NL_NAME_1', 'NAME_2',
       'VARNAME_2', 'NL_NAME_2', 'TYPE_2', 'ENGTYPE_2', 'CC_2', 'HASC_2',
       'geometry'],
      dtype='object')
Index(['time', 'time_t', 'location_lat', 'location_lon', 'wifi_connected',
       'sensor_light_mean', 'sensor_accelerometer_x_mean',
       'sensor_accelerometer_y_mean', 'sensor_accelerometer_z_mean',
       'sensor_gravity_x_mean', 'sensor_gravity_y_mean',
       'sensor_gravity_z_mean', 'sensor_gyroscope_x_mean',
       'sensor_gyroscope_y_mean', 'sensor_gyroscope_z_mean',
       'sensor_linear_acc_x_mean', 'sensor_linear_acc_y_mean',
       'sensor_linear_acc_z_mean', 'sensor_rotation_vec_x_mean',
       'sensor_rotation_vec_y_mean', 'sensor_rotation_vec_z_mean',
       'sensor_proximity_mean', 'label', 'activity_label', 'uid',
       'trajectory_id', 'posicao_it', 'posicao_pt', 'geometry'],
      dtype='object')
```

```
C:\Users\sandra\anaconda3\Lib\site-packages\mapclassify\classifiers.py:686: UserWarning: Not enough unique values in array
to form 10 classes. Setting k to 3.
  self._classify()
```

Out[6]:


Asti
Alessandria
Parma
Ferrara
Modena
Emilia-Romagna
Cuneo
Genova
Savona
Liguria
La Spezia
Monaco
Monaco
Prato
Firenze
Toscana
Siena
Arezzo
San Vincenzo
Parc naturel
marin du
Cap Corse
et de l'Agriate
30 km
20 mi
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In [ ]: