```
import folium
from folium.plugins import BeautifyIcon
import pandas as pd


from google.colab import drive
drive.mount('/content/gdrive')
```

```
Mounted at /content/gdrive
```

```
!pip install geopandas
```

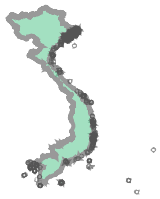
```
Collecting geopandas
  Downloading https://files.pythonhosted.org/packages/d7/bf/e9cefb69d39155d122b6ddca5
     |████████████████████████████████| 1.0MB 4.0MB/s
Requirement already satisfied: pandas>=0.24.0 in /usr/local/lib/python3.7/dist-packag
Collecting fiona>=1.8
  Downloading https://files.pythonhosted.org/packages/9c/fc/9807326c37a6bfb2393ae3e1c
     |████████████████████████████████| 15.4MB 232kB/s
Requirement already satisfied: shapely>=1.6 in /usr/local/lib/python3.7/dist-packages
Collecting pyproj>=2.2.0
  Downloading https://files.pythonhosted.org/packages/11/1d/1c54c672c2faf08d28fe78e15
     |████████████████████████████████| 6.6MB 31.2MB/s
Requirement already satisfied: numpy>=1.15.4 in /usr/local/lib/python3.7/dist-package
Requirement already satisfied: python-dateutil>=2.7.3 in /usr/local/lib/python3.7/dis
Requirement already satisfied: pytz>=2017.2 in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: certifi in /usr/local/lib/python3.7/dist-packages (fro
Requirement already satisfied: six>=1.7 in /usr/local/lib/python3.7/dist-packages (fr
Requirement already satisfied: attrs>=17 in /usr/local/lib/python3.7/dist-packages (f
Collecting munch
  Downloading https://files.pythonhosted.org/packages/cc/ab/85d8da5c9a45e072301beb37a
Requirement already satisfied: setuptools in /usr/local/lib/python3.7/dist-packages (
Requirement already satisfied: click>=4.0 in /usr/local/lib/python3.7/dist-packages (
Collecting cligj>=0.5
  Downloading https://files.pythonhosted.org/packages/73/86/43fa9f15c5b9fb6e826204288
Collecting click-plugins>=1.0
  Downloading https://files.pythonhosted.org/packages/e9/da/824b92d9942f4e4727024888f
Installing collected packages: munch, cligj, click-plugins, fiona, pyproj, geopandas
Successfully installed click-plugins-1.1.1 cligj-0.7.2 fiona-1.8.20 geopandas-0.9.0 m
```

```
import geopandas as gp


geo_df = gp.read_file('Vietnam_AL2-AL2.shp',encoding='utf8')
geo_df.head()
```

	id	country	name	enname	locname	offname	boundary	adminlevel	wikid
0	49915	VNM	Vietnam	Vietnam	Vi?t	C?ng Ha X H? i Ch?	administrative	2	Q

```
geo_df.loc[0,'geometry']
```

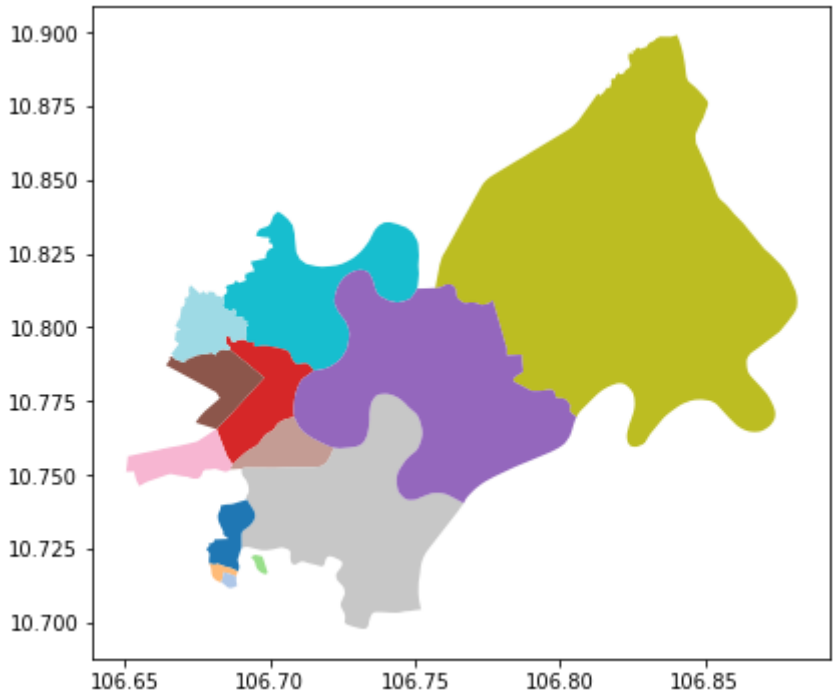


```
gdf = gp.read_file('district-boundary-hcm-city.geojson')
gdf.head()
```

	id	name	localname	timestamp	SRID	admin_level	tags
0	3850184	Saigon South	Khu đô thị Nam Sài Gòn	2016-03-18T23:05:02	4326	5	{'name': 'Khu đô thị Nam Sài Gòn', 'name:en': ...
1	3797166	Binh Thanh District	Quận Bình Thạnh	2016-03-18T23:05:02	4326	6	{'name': 'Quận Bình Thạnh', 'name:en': 'Binh T...

```
gdf.plot(column='localname',cmap='tab20',figsize=(8,6))
```

```
<matplotlib.axes._subplots.AxesSubplot at 0xabd9670>
```




```
print(gdf.crs)
```

```
epsg:4326
```

```
gdf.geometry = gdf.geometry.to_crs(epsg = 3587)
```

```
gdf.head()
```

	id	name	localname	timestamp	SRID	admin_level	tags
0	3850184	Saigon South	Khu đô thị Nam Sài Gòn	2016-03-18T23:05:02	4326	5	{'name': 'Khu đô thị Nam Sài Gòn', 'name:en': ...
1	3797166	Binh Thanh District	Quận Bình Thạnh	2016-03-18T23:05:02	4326	6	{'name': 'Quận Bình Thạnh', 'name:en': 'Binh T...

```
gdf.crs
```

```
<Projected CRS: EPSG:3587>
Name: NAD83(NSRS2007) / Michigan Central
Axis Info [cartesian]:
- X[east]: Easting (metre)
- Y[north]: Northing (metre)
Area of Use:
- name: USA - Michigan - SPCS - C
- bounds: (-87.06, 43.8, -82.27, 45.92)
Coordinate Operation:
- name: SPCS83 Michigan Central zone (meters)
- method: Lambert Conic Conformal (2SP)
Datum: NAD83 (National Spatial Reference System 2007)
- Ellipsoid: GRS 1980
- Prime Meridian: Greenwich
```

```
latitude = 10.7758439
longitude = 106.7017555
```

```
df = pd.read_excel('/content/gdrive/MyDrive/HCMC_location.xlsx', sheet_name='Location')
df.head()
```

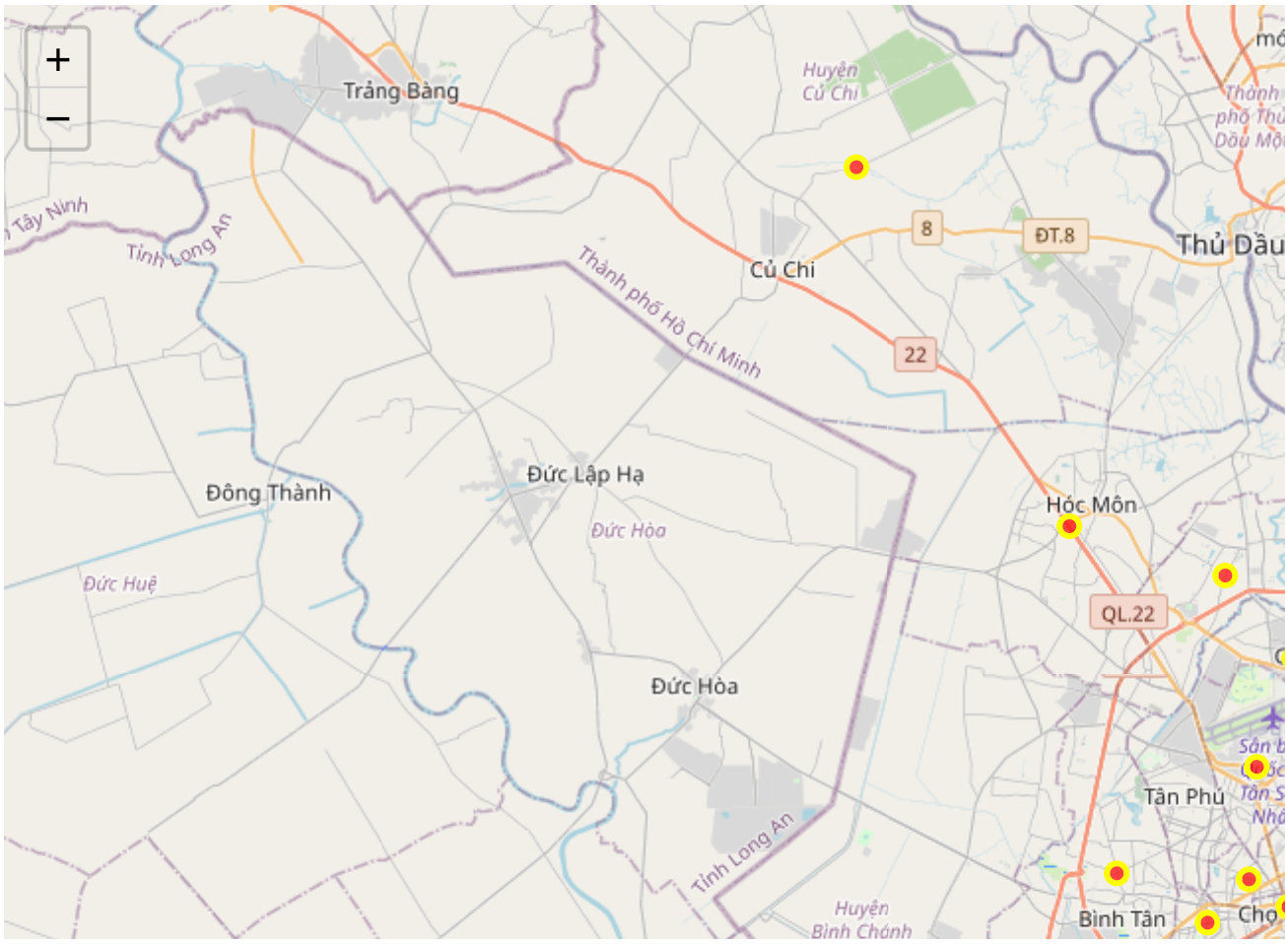
	STT	ID	Name	Bourough	Postal cost	Latitude	Longitude	Population	Population_al
0	1	760	Quận 1	Vietnam, Quan 1	NaN	10.775659	106.700424	193.632	19363
1	2	761	Quận 12	Vietnam, Quan 12	NaN	10.867153	106.641332	510.326	51032
2	3	762	Quận Thủ Đức	Vietnam, Thu Duc	NaN	10.849409	106.753705	528.413	52841

```
# create map of Toronto using latitude and longitude values
map_hcm = folium.Map(location=[latitude, longitude], zoom_start=11)

# add markers to map
for lat, lng, label in zip(df['Latitude'], df['Longitude'], df['Name']):
    folium.CircleMarker(
        [lat, lng],
        radius=5,
        popup=label,
        color='yellow',
        fill=True,
```

```
        fill_color='red',
        tooltip=label,
        fill_opacity=0.7).add_to(map_hcm)

map_hcm
```




```
# create map of Toronto using latitude and longitude values
map_hcm = folium.Map(location=[latitude, longitude], zoom_start=11)
```

```
# add markers to map
for lat, lng, label in zip(df['Latitude'], df['Longitude'], df['Name']):
    icon_star = folium.Icon(
        prefix='fa',
        icon='fa-apple',
        icon_color='red',
    )
    folium.Marker([lat, lng],icon=icon_star, tooltip=label).add_to(map_hcm)

map_hcm
```


```
# Make an empty map
m = folium.Map(location=[15, 0], tiles="OpenStreetMap", zoom_start=2)

# square marker
icon_square = BeautifyIcon(
    icon_shape='rectangle-dot',
    border_color='red',
    border_width=10,
)
folium.Marker([50, -70], tooltip='square', icon=icon_square).add_to(m)

# circle marker
icon_circle = BeautifyIcon(
    icon_shape='ambulance',
    border_color='green',
    border_width=10,
)
folium.Marker([-20, 25], tooltip='circle', icon=icon_circle).add_to(m)

# star marker
icon_star = BeautifyIcon(
    icon_shape='star',
    border_color='green',
    border_width=10,
)
folium.Marker([60, 125], tooltip='star', icon=icon_star).add_to(m)
m
```