

# Introduccion manejo de Datos Geoespaciales con Python

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**Abstract** En este NoteBook encontraras codigo para manejar Datos Geoespaciales con Python

```
import geopandas as gpd
import matplotlib.pyplot as plt
import contextily as ctx # Opcional: para mapas base
import pandas as pd

# Read the shapefile into a GeoDataFrame
gdf = gpd.read_file("../mg_2025_integrado/conjunto_de_datos/00mun.shp")

# View the first few rows and associated attributes
print(gdf.head())
```

	CVEGEO	CVE_ENT	CVE_MUN	NOMGEO \
0	01001	01	001	Aguascalientes
1	01008	01	008	San José de Gracia
2	01011	01	011	San Francisco de los Romo
3	01009	01	009	Tepezalá
4	01007	01	007	Rincón de Romos

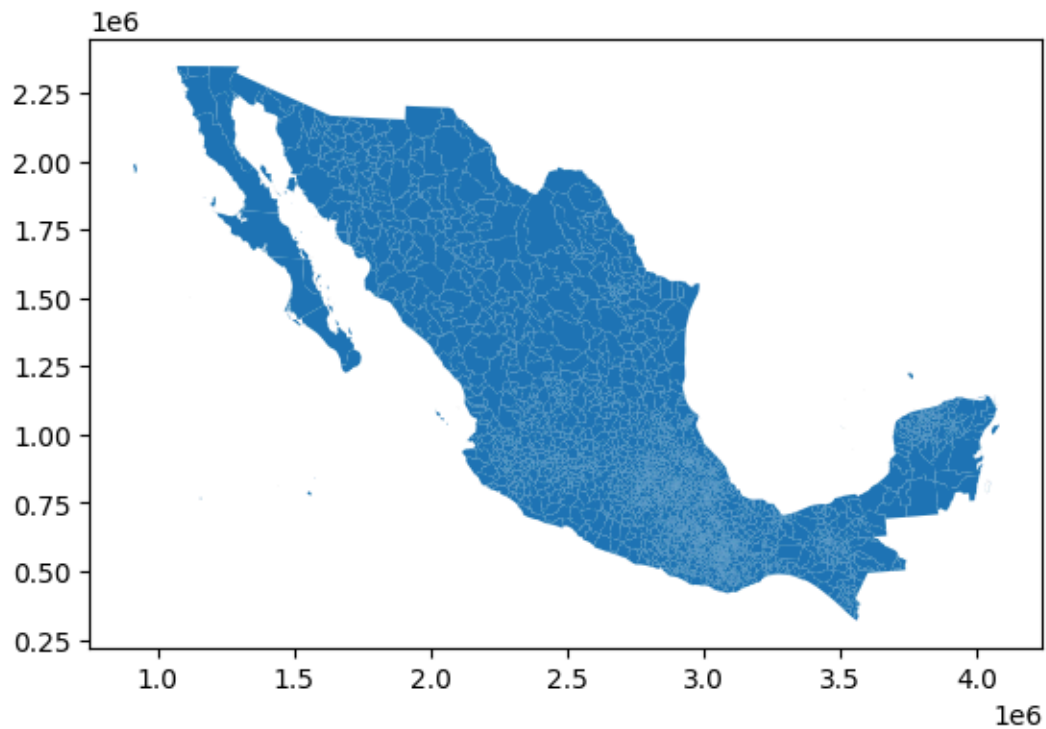
	geometry
0	POLYGON ((2488980.227 1117358.447, 2489013.495...
1	POLYGON ((2453326.553 1143576.423, 2453363.325...
2	POLYGON ((2483638.349 1120034.022, 2483946.175...
3	POLYGON ((2481826.447 1149055.253, 2481589.222...
4	POLYGON ((2476760.231 1150329.046, 2476783.634...

```
excel_df = pd.read_excel("IMM_2020.xlsx", sheet_name= "IMM_2020")
```

```
type(gdf)
```

```
geopandas.geodataframe.GeoDataFrame
```

```
gdf.plot()
```



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

```
PROJCS["MEXICO_ITRF_2008_LCC",GEOGCS["ITRF2008",DATUM["International_Terrestrial_Reference_Frame_1980",6378137,298.257222101,AUTHORITY["EPSG","7019"]],AUTHORITY["EPSG","1061"]],PRIMEM["Greenwich"]]
```

```
# Ajuste del tipo de dato para poder hacer Merge
gdf["CVEGEO"] = gdf["CVEGEO"].astype(str)
excel_df["CVE_MUN"] = excel_df["CVE_MUN"].astype(str)
```

```
merged_gdf = gdf.merge(excel_df, left_on="CVEGEO",
right_on="CVE_MUN",how="inner")
```

```
merged_gdf.head()
```

CVE	EVENT_MEN_NOME	NO	NO	NO	NO	TOT	O.VSD	SD	DES	AVP	HP	AC	50	10	20	20	20	20
GEO	GEO	e-																
		try																
0	100090	009	GuaPOLY0	Du- 10009	Gua-9869...	4.2935728372244822903062600052796446												829850
			nacevi	GON	rango	nacevi												
			((2078613.866															
			1611851.412,															
			2078675.423...															
1	100170	017	OcarPOLY0	Du- 10017	Ocar-8003...	4.05829424963154265873701020093558930												870007
			GON	rango														
			((2100516.1															
			1647595.689,															
			2100677.369															
			1...															
2	100360	036	TlahPOLY0	Du- 10036	Tlah-21143...	2.513531627437635539456945502674024739												893742
			GON	rango														bajo
			((2313611.763															
			1634351.113,															
			2314781.667...															
3	100210	021	PeñPOLY0	Du- 10021	Peñ-1118...	3.08385946623041569284293296574824662												888229
			BlancGON	rango	Blanco													bajo
			((2282098.631															
			1446608.773,															
			2280795.075...															
4	100340	034	TamPOLY0	Du- 10034	Tam-26000...	17.543665974283682625680000050901570												737373
			GON	rango														alto
			((2004791.908															
			1520210.009,															
			2007814.583...															

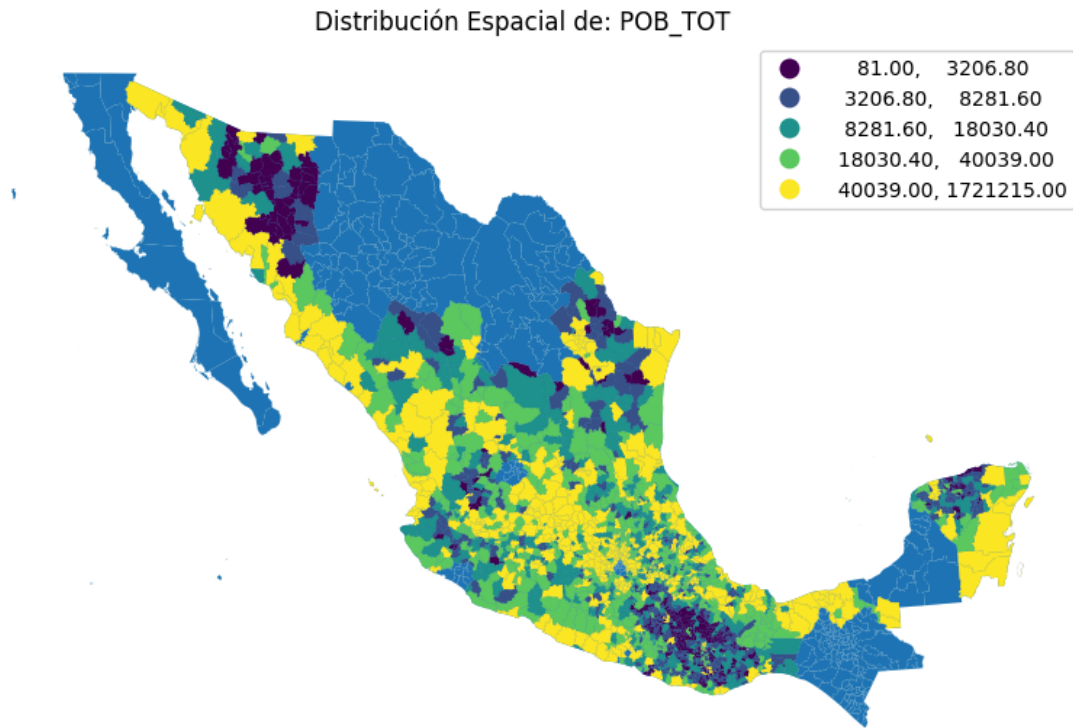
```
#variable_interes="IMN_2020"
variable_interes="POB_TOT"
```

```
f, ax = plt.subplots(1, figsize=(10, 10))
gdf.plot(ax=ax)
merged_gdf.plot(column=variable_interes,
                 scheme='quantiles', # Clasificación por cuantiles
```

```

        k=5,                # 5 clases
        cmap='viridis',     # Mapa de color
        legend=True,
        ax=ax)
ax.set_title(f"Distribución Espacial de: {variable_interes}")
ax.set_axis_off()
plt.show()

```



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<https://www.inegi.org.mx/temas/mg/#descargas> <https://www.inegi.org.mx/app/biblioteca/ficha.html?upc=794551163061>

Índices de marginación 2020

<https://www.gob.mx/conapo/documentos/indices-de-marginacion-2020-284372>