Tree Census Bengaluru 2025. Data downloaded from OpenCity https://data.opencity.in/dataset/bengaluru-tree-census-data

I have analysed the ongoing Tree Census in Bengaluru. The code was written in February 2025. As and when data is added I will update the code.

Happy Coding, be curious :)

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

!pip install geopandas
```

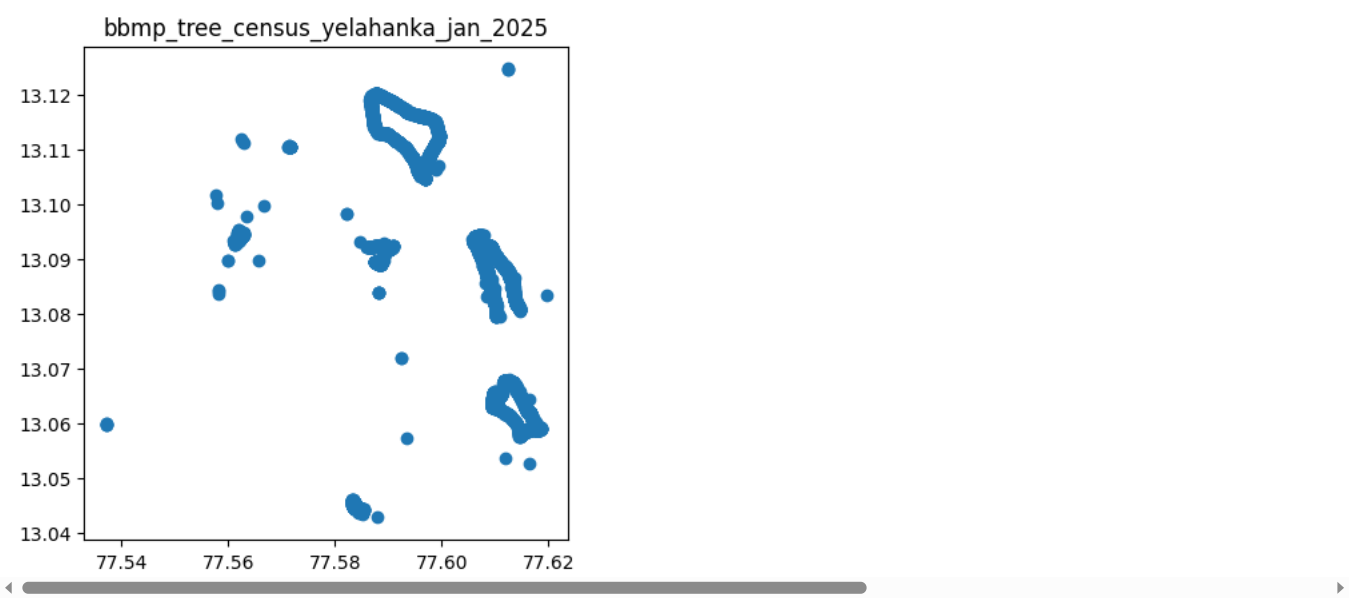
```
import os
import geopandas as gpd

# Step 4: Define the path to your folder
folder_path = '/content/drive/My Drive/2025_bengaluru_treecensus' #give the path where data is saved

# Step 5: List all KML files in the folder
kml_files = [f for f in os.listdir(folder_path) if f.endswith('.kml')]

# Step 6: Load each KML file into a GeoDataFrame
for kml_file in kml_files:
    file_path = os.path.join(folder_path, kml_file)
    gdf = gpd.read_file(file_path)
    print(f"Loaded {kml_file} with {len(gdf)} features")
```

Show hidden output

Start coding or generate with AI.

```
#this is just to check one kml

import pandas as pd
import matplotlib.pyplot as plt
```

```
file_path = os.path.join(folder_path, 'bbmp_tree_census_yelahanka_jan_2025.kml')
gdf = gpd.read_file(file_path)

# Plot the GeoDataFrame
gdf.plot()
plt.title('bbmp_tree_census_yelahanka_jan_2025')
plt.show()
```




```
# while loading kml certain columns were missing. Hence i merged all 7 kml in QGIS. saved as a geopackage and uploaded it to drive

import pandas as pd
import geopandas as gpd

file_path = '/content/drive/My Drive/2025_bengaluru_treecensus/merged_tree_2025.gpkg'
```

```
gdf_allzones = gpd.read_file(file_path)

# Now you can work with the geopandas GeoDataFrame 'gdf'
print(gdf_allzones.head())
```

Show hidden output

```
# prompt: convert geopackage to shapefile

# Assuming 'gdf_allzones' is your GeoDataFrame loaded from the geopackage

output_shapefile_path = '/content/drive/My Drive/2025_bengaluru_treecensus/merged_tree_2025.shp'  # Specify the desired output path for t

gdf_allzones.to_file(output_shapefile_path)

print(f"Shapefile created at: {output_shapefile_path}")
```

Show hidden output

```
# prompt: gdf_allzones all points . print no of points. give number in lakhs use comma

num_points = len(gdf_allzones)
print(f'{num_points/100000:,.2f} Lakhs')
```

```
4.17 Lakhs
```

```
print(gdf_allzones.crs)
```

```
EPSG:4326
```

```
# prompt: how many unique values are in column TreeName. The no of species

# Assuming 'gdf' is your GeoDataFrame
unique_species_count = gdf_allzones['TreeName'].nunique()
print(f"Number of unique tree species: {unique_species_count}")
```

```
Number of unique tree species: 234
```

We will ignore others. Total species will be **233**

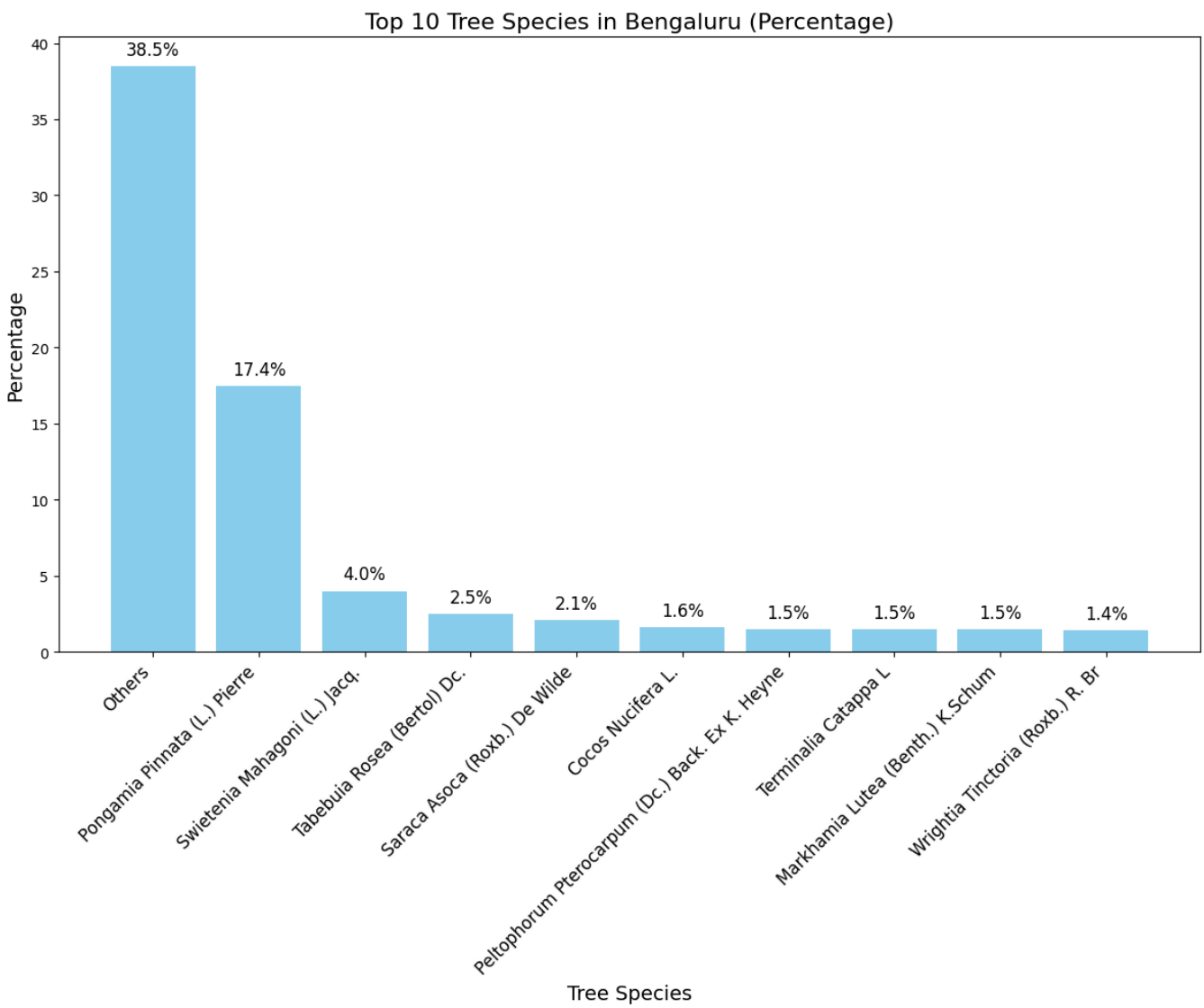
```
# prompt: write a code that will group species with same name and create a table

# Group by 'TreeName' and count occurrences
species_counts = gdf_allzones.groupby('TreeName').size().reset_index(name='Count')

# Sort the table by count in descending order
species_counts = species_counts.sort_values(by='Count', ascending=False)

# Display the table
species_counts
```

	TreeName	Count
153	Others	160463
173	Pongamia Pinnata (L.) Pierre	72725
200	Swietenia Mahagoni (L.) Jacq.	16622
212	Tabebuia Rosea (Bertol) Dc.	10351
189	Saraca Asoca (Roxb.) De Wilde	8655
...	...	...
123	Limonia Acidissima L.	3
87	Eriobotrya Japonica (Thunb.) Lindley	2
39	Brownea Coccinea Jacq.	2
217	Tecoma Castanifolia (D. Don) Melch	2
137	Melaleuca Leucodendron L	1

234 rows × 2 columns

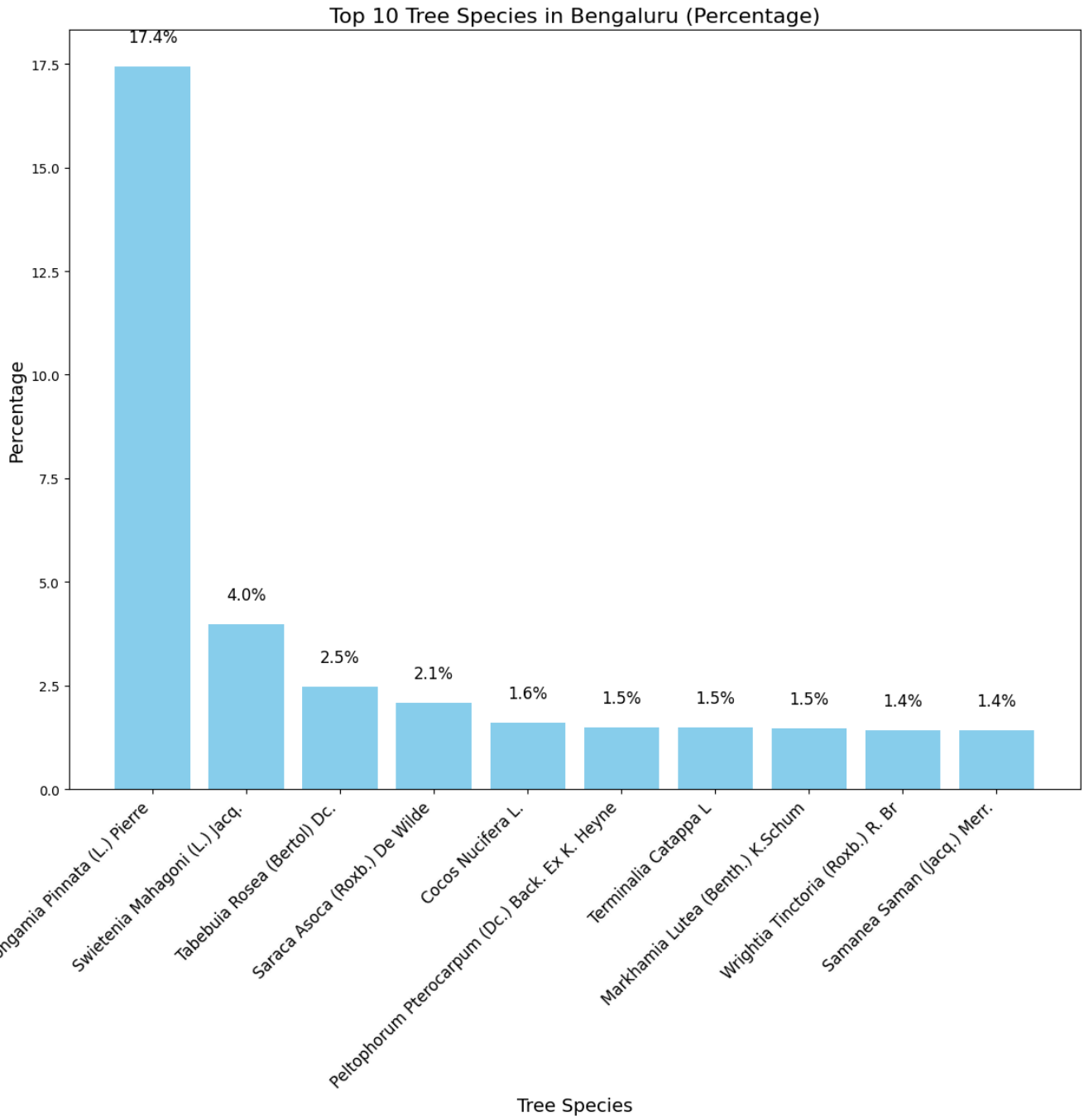
Next steps: Generate code with species_counts | View recommended plots | New interactive sheet

```
import matplotlib.pyplot as plt

total_trees = species_counts['Count'].sum()
species_counts['Percentage'] = (species_counts['Count'] / total_trees) * 100

#  top 10 species
top_10_species = species_counts.head(10)

#  bar chart
plt.figure(figsize=(12, 10))  # Increased figure size for better readability
bars = plt.bar(top_10_species['TreeName'], top_10_species['Percentage'], color='skyblue')
plt.xlabel("Tree Species", fontsize=14) # Increased font size
plt.ylabel("Percentage", fontsize=14) # Increased font size
plt.title("Top 10 Tree Species in Bengaluru (Percentage)", fontsize=16) # Increased font size
plt.xticks(rotation=45, ha='right', fontsize=12) # Increased font size and rotated labels
plt.tight_layout()

# Add percentage labels on top of each bar
for bar, percentage in zip(bars, top_10_species['Percentage']):
    yval = bar.get_height()
    plt.text(bar.get_x() + bar.get_width()/2, yval + 0.5, f'{percentage:.1f}%', ha='center', va='bottom', fontsize=12) # Increased font
plt.savefig('/content/top_10_tree_species.png', dpi=300, bbox_inches='tight')
plt.show()
```



Other that has 38 percent is not really species. So we will ignore that.

```
import matplotlib.pyplot as plt


# Calculate the total number of trees
total_trees = species_counts['Count'].sum()

# Calculate the percentage of each species
species_counts['Percentage'] = (species_counts['Count'] / total_trees) * 100

# Sort by percentage in descending order
species_counts = species_counts.sort_values(by='Percentage', ascending=False)

# Get the top 10 species (excluding the highest percentage)
top_10_species = species_counts[1:11]  # Slice from index 1 (second element) to 11 (exclusive)

# Create the bar chart for the top 10 species
plt.figure(figsize=(12, 12))
bars = plt.bar(top_10_species['TreeName'], top_10_species['Percentage'], color='skyblue')
plt.xlabel("Tree Species", fontsize=14)
plt.ylabel("Percentage", fontsize=14)
plt.title("Top 10 Tree Species in Bengaluru (Percentage)", fontsize=16)
plt.xticks(rotation=45, ha='right', fontsize=12)
plt.tight_layout()

# Add percentage labels on top of each bar
for bar, percentage in zip(bars, top_10_species['Percentage']):
    yval = bar.get_height()
    plt.text(bar.get_x() + bar.get_width()/2, yval + 0.5, f'{percentage:.1f}%', ha='center', va='bottom', fontsize=12)
plt.savefig('/content/final_top_10_tree_species.png', dpi=300, bbox_inches='tight')
plt.show()
```



Double-click (or enter) to edit

Start coding or generate with AI.

```
top_10_species = species_counts.head(10)

# Print the list of top 10 species
print(top_10_species['TreeName'].tolist())
```

```
['Others', 'Pongamia Pinnata (L.) Pierre', 'Swietenia Mahagoni (L.) Jacq.', 'Tabebuia Rosea (Bertol) Dc.', 'Saraca Asoca (Roxb.) De
```

I want to see the distribution of Tabebuia Rosea. The tree that gives Bengaluru pink colours.

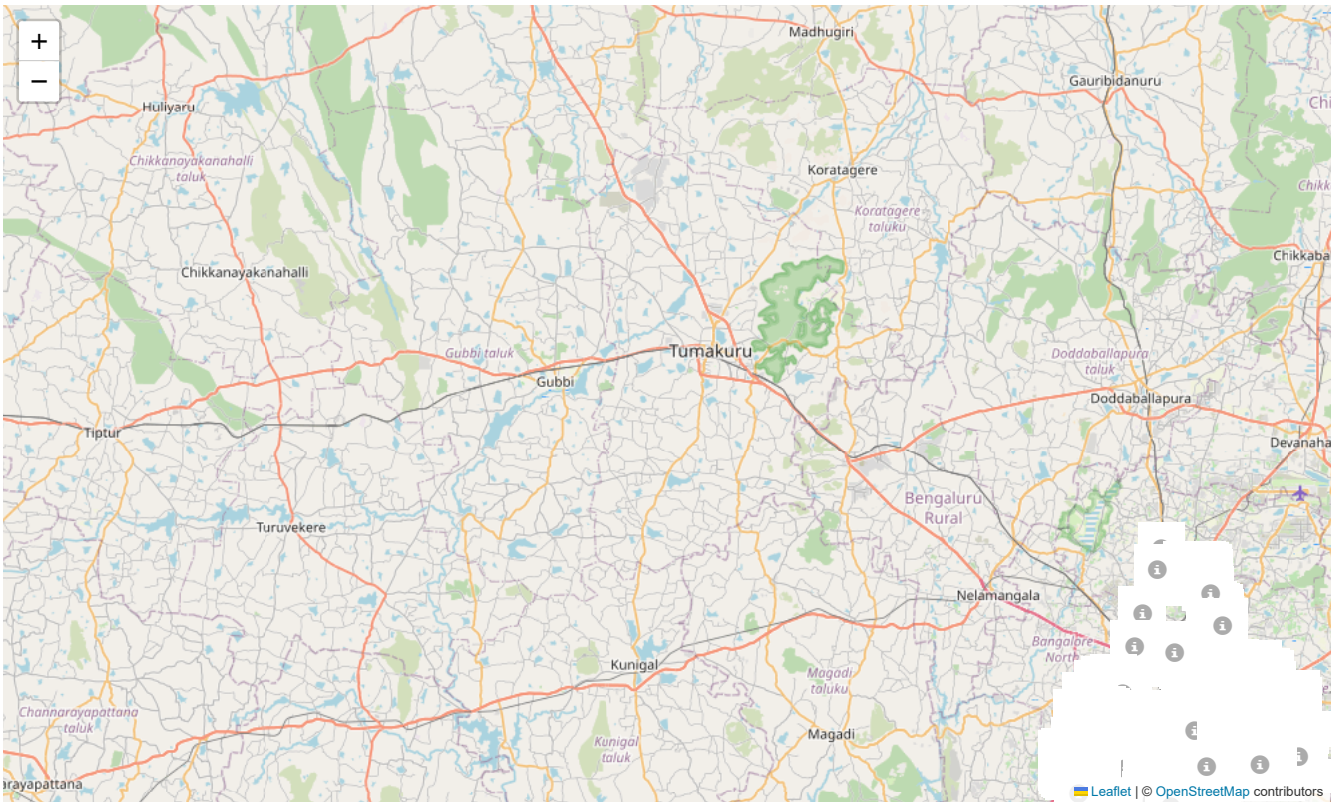
```
#

# Filter the GeoDataFrame for 'Tabebuia Rosea (Bertol) Dc.'
tabebuia_rosea_gdf = gdf_allzones[gdf_allzones['TreeName'] == 'Tabebuia Rosea (Bertol) Dc.']

# Export the filtered GeoDataFrame to a new GeoPackage file
output_file = '/content/drive/My Drive/2025_bengaluru_treecensus/tabebuia_rosea.gpkg'
tabebuia_rosea_gdf.to_file(output_file, driver='GPKG')

print(f"GeoPackage file created: {output_file}")
```

```
GeoPackage file created: /content/drive/My Drive/2025_bengaluru_treecensus/tabebuia_rosea.gpkg
```

```
#  print count of tabebuia_rosea_gdf. The tree that gives Bengaluru pink colour.

print(len(tabebuia_rosea_gdf))
```

```
10351
```

```
#use matplotlib and folium to plot tabebuia_rosea. use a red marker . put title as Distribution of Tabebuia Rosea in Bengaluru.

import folium

# Assuming tabebuia_rosea_gdf is already created as in the previous code

# Create a map centered around Bengaluru
m = folium.Map(location=[12.9716, 77.5946], zoom_start=10)

# Add markers for each Tabebuia Rosea tree
for index, row in tabebuia_rosea_gdf.iterrows():
    folium.Marker(
        location=[row.geometry.y, row.geometry.x],
        popup=row['TreeName'],  # Optional: Add tree name as popup
        icon=folium.Icon(color='red')
    ).add_to(m)

# Set the map title
m.title = 'Distribution of Tabebuia Rosea in Bengaluru'

# Display the map
m
```

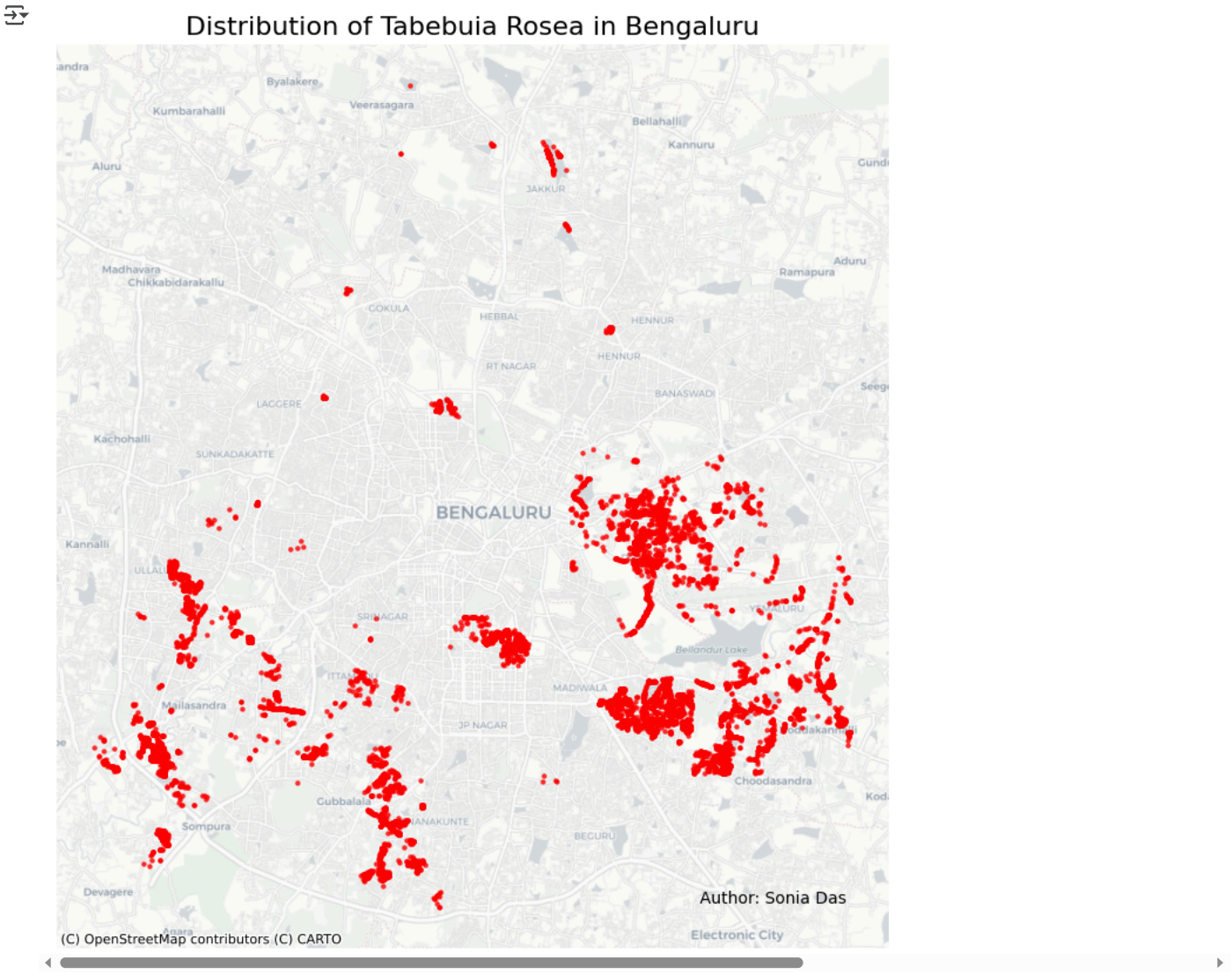



```
pip install contextily
```

Show hidden output

```
import contextily as ctx
import matplotlib.pyplot as plt

# Assuming tabebuia_rosea_gdf is your GeoDataFrame for Tabebuia Rosea

# Create the plot
fig, ax = plt.subplots(figsize=(10, 10))  # Adjust figure size as needed
tabebuia_rosea_gdf.to_crs(epsg=3857).plot(ax=ax, markersize=5, color='red', alpha=0.7)  # Use appropriate markersize

# Add CartoDB basemap
ctx.add_basemap(ax, source=ctx.providers.CartoDB.Positron)  # You can explore other basemaps

# Remove axis
ax.set_axis_off()

# Add title
plt.title("Distribution of Tabebuia Rosea in Bengaluru", fontsize=16)
```

```
# Add author text in the corner
plt.text(0.95, 0.05, "Author: Sonia Das", transform=ax.transAxes, ha='right', fontsize=10)

# Show plot
plt.show()
```




```
!pip install folium geopandas shapely

import folium
import geopandas as gpd
from shapely.geometry import Point, shape
from folium.plugins import Draw
from google.colab import output

# Load your GeoDataFrame (Ensure it's pre-loaded)
# tabebuia_rosea_gdf = gpd.read_file("path_to_your_shapefile_or_geojson")

# Function to create a folium map with Leaflet Draw
def create_map():
    m = folium.Map(location=[12.9716, 77.5946], zoom_start=12)

    # Add points
    for _, row in tabebuia_rosea_gdf.iterrows():
        folium.CircleMarker(
            location=[row.geometry.y, row.geometry.x],
            radius=4,
            color="red",
            fill=True,
            fill_color="red",
            fill_opacity=0.5
        ).add_to(m)

    # Add drawing tool
    draw = Draw(
        export=True,  # Allows user to export the drawn shape
        draw_options={"circle": True, "polygon": True, "rectangle": True},
        edit_options={"remove": True}
```

```
        )
        draw.add_to(m)

        return m

    # Display the interactive map
    m = create_map()
    display(m)
```

```
Requirement already satisfied: folium in /usr/local/lib/python3.11/dist-packages (0.19.5)
Requirement already satisfied: geopandas in /usr/local/lib/python3.11/dist-packages (1.0.1)
Requirement already satisfied: shapely in /usr/local/lib/python3.11/dist-packages (2.0.7)
Requirement already satisfied: branca>=0.6.0 in /usr/local/lib/python3.11/dist-packages (from folium) (0.8.1)
Requirement already satisfied: jinja2>=2.9 in /usr/local/lib/python3.11/dist-packages (from folium) (3.1.6)
Requirement already satisfied: numpy in /usr/local/lib/python3.11/dist-packages (from folium) (2.0.2)
Requirement already satisfied: requests in /usr/local/lib/python3.11/dist-packages (from folium) (2.32.3)
Requirement already satisfied: xyzservices in /usr/local/lib/python3.11/dist-packages (from folium) (2025.1.0)
```