# Practical no: 10

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Roll No: 13

Batch : C1

Topic Covered: Geopy & Folium

Task 1: Consider Names of two places from the user and find out the distance between them using Geopy library and Mark the location using folium. Now connect both two places on the map by line using Polyline method

```
pip install geopy
```

```
Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/public/simple/
Requirement already satisfied: geopy in /usr/local/lib/python3.8/dist-packages (1.17.0)
Requirement already satisfied: geographiclib<2,>=1.49 in /usr/local/lib/python3.8/dist-packages (from geopy) (1.52)
```

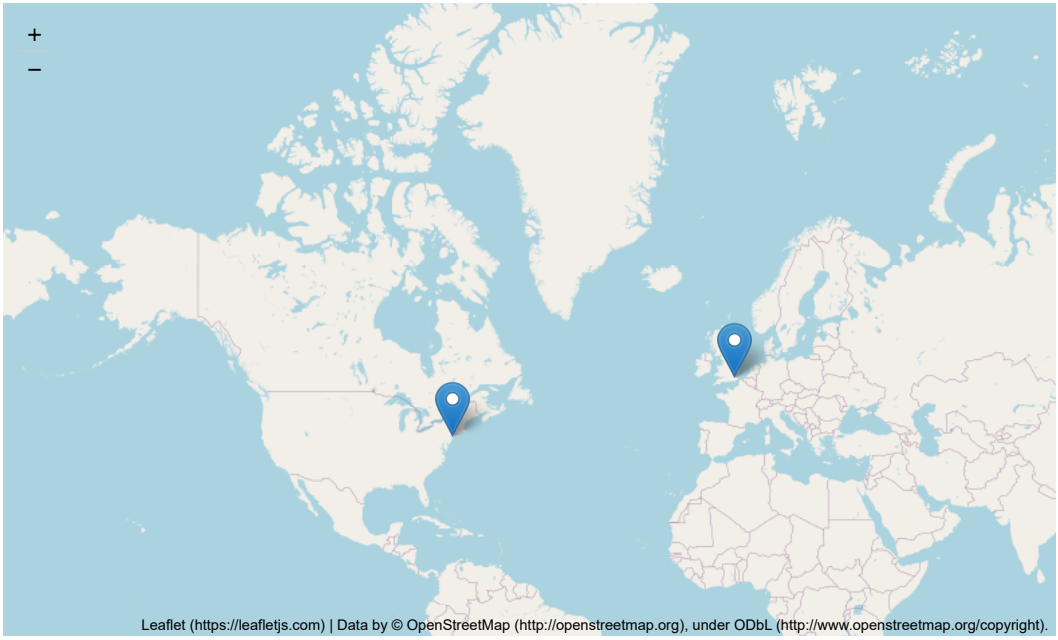
```
pip install folium
```

```
Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/public/simple/
Requirement already satisfied: folium in /usr/local/lib/python3.8/dist-packages (0.12.1.post1)
Requirement already satisfied: branca>=0.3.0 in /usr/local/lib/python3.8/dist-packages (from folium) (0.6.0)
Requirement already satisfied: requests in /usr/local/lib/python3.8/dist-packages (from folium) (2.25.1)
Requirement already satisfied: numpy in /usr/local/lib/python3.8/dist-packages (from folium) (1.21.6)
Requirement already satisfied: jinja2>=2.9 in /usr/local/lib/python3.8/dist-packages (from folium) (2.11.3)
Requirement already satisfied: MarkupSafe>=0.23 in /usr/local/lib/python3.8/dist-packages (from jinja2>=2.9->folium) (2.0.1)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in /usr/local/lib/python3.8/dist-packages (from requests->folium) (1.24.3)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.8/dist-packages (from requests->folium) (2022.12.7)
Requirement already satisfied: chardet<5,>=3.0.2 in /usr/local/lib/python3.8/dist-packages (from requests->folium) (4.0.0)
Requirement already satisfied: idna<3,>=2.5 in /usr/local/lib/python3.8/dist-packages (from requests->folium) (2.10)
```

```
from geopy.distance import geodesic as GD
from geopy.geocoders import Nominatim

loc1=input("Enter first location :")
geolocator1=Nominatim(user_agent="my_request")
location1=geolocator1.geocode(loc1)

loc2=input("Enter second location :")
geolocator2=Nominatim(user_agent="my_request")
location2=geolocator2.geocode(loc2)

print(location1.address)
print((location1.latitude,location1.longitude))
print(location2.address)
print((location2.latitude,location2.longitude))

la1,lo1=location1.latitude,location1.longitude
la2,lo2=location2.latitude,location2.longitude
```

```
Enter first location :New York
Enter second location :London
City of New York, New York, United States
(40.7127281, -74.0060152)
London, Greater London, England, United Kingdom
(51.5073219, -0.1276474)
```

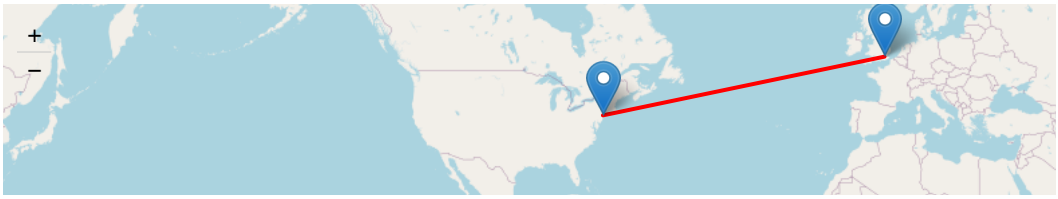
```
import folium
world=folium.Map(zoom_start=2)

folium.Marker(location=[la1,lo1,]).add_to(world)
folium.Marker(location=[la2,lo2,]).add_to(world)
world
```




```
place1=(48.8588897, 2.3200410217200766)
place2=(40.7127281, -74.0060152)

print("The distance between two places is : ",GD(place1,place2).km)
```

```
     The distance between two places is :  5850.655606443815
```

```
p=[(la1,lo1),(la2,lo2)]
folium.PolyLine(p,color='red').add_to(world)
world
```



Task 2. Using “list-indian-states-and-capitals.csv” file get the name of Indian-state-capitals using Geopy find the latitude and longitude of the Indian-state-capitals and label the capital on the map using folium.

```
import pandas as pd
cities=pd.read_csv('list-indian-states-and-capitals.csv')
cities.head(7)
```

| | S.No | StateName | Capital | Area | Population | StateEstablished | LargestCity | Lang |
|---|---|---|---|---|---|---|---|---|
| **0** | 1 | Andhra Pradesh | Hyderabad (de jure)\nAmaravati (de facto)\nVis... | 1,60,205 Sq Km | 49.67 Million | 01-10-1953 | Visakhapatnam | |
| **1** | 2 | Arunachal Pradesh | Itanagar | 83,743 sq. km | 13,82,611 | 20-02-1987 | Itanagar | Monpa, Mij Sherdı \nNyishi, Ap |
| **2** | 3 | Assam | Dispur | 78,438 sq. km | 3,11,69,272 | 26-01-1950 | Guwahati | Assa |
| **3** | 4 | Bihar | Patna | 94,163 sq. km | 10,38,04,637 | 26-01-1950 | Patna | Hind |

```
la=[]
lo=[]
a=[]
from geopy.geocoders import Nominatim
for i in range (0,len(cities['Capital '])-1):
  loc = cities['Capital '][i]
  geolocator = Nominatim(user_agent="my_raequest")
  location = geolocator.geocode(loc)
  print(i,location.address)
  print((location.latitude, location.longitude))
  la.append(location.latitude)
  lo.append(location.longitude)
  a.append((la[i],lo[i]))
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
<ipython-input-14-bf4e6d3ae057> in <module>
      7   geolocator = Nominatim(user_agent="my_raequest")
      8   location = geolocator.geocode(loc)
----> 9   print(i,location.address)
     10   print((location.latitude, location.longitude))
     11   la.append(location.latitude)

AttributeError: 'NoneType' object has no attribute 'address'
```

SEARCH STACK OVERFLOW

Task 3: Locate the following locations of the Nagpur city on the map using geopy and folium. Add tooltip, popup info, set specific color and set the suitable icon to the given location. Also mark the area with the circle. 1) RCOEM

2) Your home location

3) hospital with + sign

4) Hotel

5) Eternity Mall Nagpur

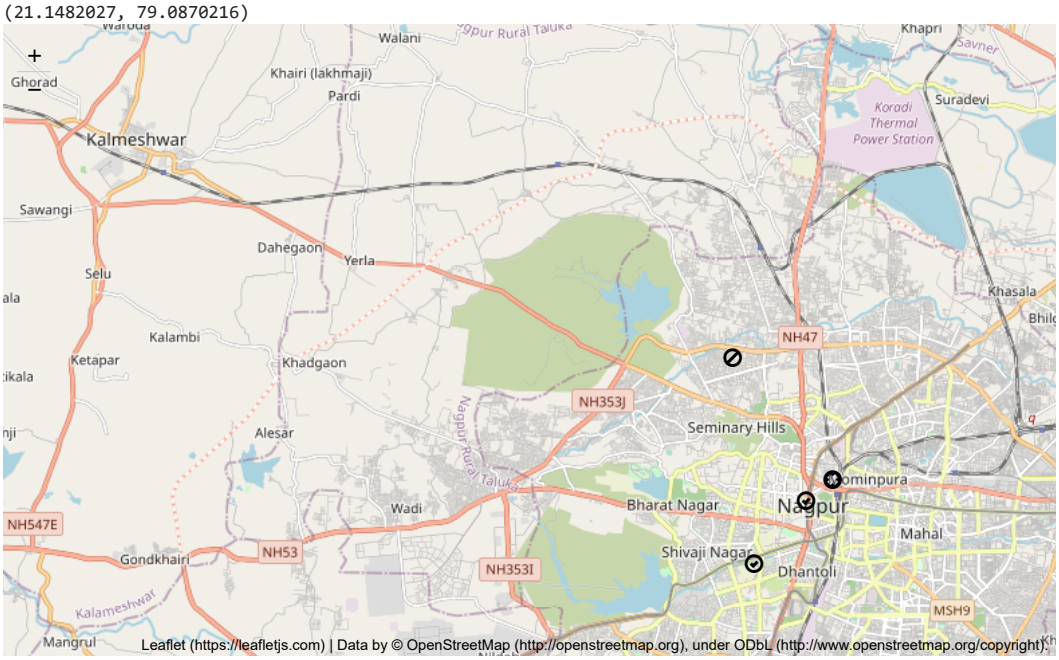
6) Deekshabhoomi

7) Temple of Tekdi Ganesh

```
world_all_cities = folium.Map()
la=[]
lo=[]
icons=['ban-circle','house','ok-circle','ok-circle','remove-sign']
a=[]
nag=['RCOEM','Gittikhadan','Eternity mall','Deekshabhoomi','Tekdi Ganesh nagpur']
from geopy.geocoders import Nominatim
for i in range (0,5):
  loc = nag[i]
```

```
  geolocator = Nominatim(user_agent="my_raequest")
  location = geolocator.geocode(loc)
  print(i,location.address)
  print((location.latitude, location.longitude))
  la.append(location.latitude)
  lo.append(location.longitude)
  a.append((la[i],lo[i]))
  folium.Marker(location=[la[i],lo[i]],popup=nag[i],tooltip=nag[i],icon=folium.Icon(color='blue',icon=icons[i])).add_to(world_all_cities)
world_all_cities
```

```
0 RCOEM IT Square, Seminary Hills, Nagpur Urban Taluka, Nagpur, Maharashtra, 440013, India
(21.1773238, 79.0614865)
1 Gittikhadan road, Seminary Hills, Nagpur Urban Taluka, Nagpur, Maharashtra, 440013, India
(21.1750912, 79.0608519)
2 Eternity Mall, Wardha Road Flyover, Vasant Nagar, Dhantoli, Nagpur Urban Taluka, Nagpur, Maharashtra,
(21.143152049999998, 79.08022817813524)
3 Deekshabhoomi, South Ambazari Road, Vasant Nagar, Dhantoli, Nagpur Urban Taluka, Nagpur, Maharashtra,
(21.1282013, 79.06693)
4 Tekdi Ganesh Mandir, Ghat Road, Santra Bazaar, Mominpura, Nagpur Urban Taluka, Nagpur, Maharashtra, 4
(21.1482027, 79.0870216)
```




```
loc = 'Hotel nagpur'
i+=1
geolocator = Nominatim(user_agent="my_raequest")
location = geolocator.geocode(loc)
print(i,location.address)
print((location.latitude, location.longitude))
la.append(location.latitude)
lo.append(location.longitude)
a.append((la[i],lo[i]))
folium.Marker(
        location=[la[i], lo[i]],
    ).add_to(world_all_cities)
folium.Marker(location=[la[i],lo[i]],popup='Hotel',tooltip='<strong>Hotel</strong>',icon=folium.Icon(color='green',icon="cross")).add_to(
loc = 'Hospital nagpur'
i+=1
geolocator = Nominatim(user_agent="my_raequest")
location = geolocator.geocode(loc)
print(i,location.address)
print((location.latitude, location.longitude))
```

```
la.append(location.latitude)
lo.append(location.longitude)
a.append((la[i],lo[i]))
folium.Marker(location=[la[i],lo[i]],popup='Hospital',tooltip='<strong>Hospital</strong>',icon=folium.Icon(color='red',prefix='fa',icon='
world_all_cities
```

```
5 HOTEL SHOURYA, NH47, Nagpur Urban Taluka, Nagpur, Maharashtra, 440025, India
(21.0786436, 79.0781503)
6 Govt Medical College & Hospital, Chandan Nagar, Nagpur Urban Taluka, Nagpur, Maharashtra, India
(21.12744335, 79.0970879696533)
```