Lab 7. Interactive geovisualization with Folium library

```
import folium
from folium.plugins import
MarkerCluster
import pandas as pd
df_incidents = pd.read_csv('
Police_Department_Incidents_-
_Previous_Year__2016_.csv')
limit = 1000
df_incidents =
df_incidents.iloc[0:limit, :]
df_incidents.shape
```

So the dataframe consists of 150,500 crimes, which took place in the year 2016. In order to reduce computational cost, let's just work with the first 1000 incidents in this dataset.

Let's confirm that our dataframe now consists only of 1000 crimes

Now that we reduced the data a little bit, let's visualize where these crimes took place in the city of San Francisco. We will use the default style and we will initialize the zoom level to 12.

```
# San Francisco latitude and longitude
values // Сан-Франциско значення
широти і довготи
latitude = 37.77
longitude = -122.42
```

Now that we reduced the data a little bit, let's visualize where these crimes took place in the city of San Francisco. We will use the default style and we will initialize the zoom level to 12

```
sanfran_map = folium.Map(location =
[latitude, longitude], zoom_start = 12)

sanfran_map
# instantiate a feature group for the
incidents in the dataframe
```

Now let's superimpose the locations of the crimes onto the map. The way to do that

```
# Продемонструвати групу функцій для інцидентів на кадрі даних
incidents = folium.map.FeatureGroup()

# loop through the 1000 crimes and add each to the incidents feature group
# Петлю через 1000 злочинів і додати кожен до групи об'єктів інцидентів
for lat, lng, in zip(df_incidents.Y, df_incidents.X):
    incidents.add_child(
        folium.features.CircleMarker(
            [lat, lng],
            radius = 5, # define how big you want the circle markers to be
            color = "yellow",
            fill_color = "blue",
            fill_opacity=0.6
        )
    )

# add incidents to map
# Додавати інциденти на карту
sanfran_map.add_child(incidents)
```

in **Folium** is to create a *feature group* with its own features and style and then add it to the sanfran_map. You can also add some pop-up text that would get displayed when you hover over a marker. Let's make each marker display the category of the crime when hovered over.

```
sanfran_map = folium.Map(location = [latitude, longitude], zoom_start = 12)


# instantiate a mark cluster object for the incidents in the dataframe
```

To implement this, we start off by instantiating a *MarkerCluster* object and adding all the data points in the dataframe to this object.

```
# # Інстанція об'єкта кластерів міток
для випадків на кадрі даних
incidents =
MarkerCluster().add_to(sanfran_map)

# loop through the dataframe and
add each data point to the mark
cluster
# Петля через кадр даних і додати
кожну точку даних до кластеру
позначок
for lat, lng, label, in zip(df_incidents.Y,
df_incidents.X,
df_incidents.Category):
    folium.Marker(
        location = [lat, lng],
        icon = None,
        popup = label,
    ).add_to(incidents)


sanfran_map
```