VacationPy

Starter Code to Import Libraries and Load the Weather and Coordinates Data

```python
# Dependencies and Setup
import hvplot.pandas
import pandas as pd
import requests
import json
import pprint

# Import API key
from api_keys_vacation import geoapify_key
```

```python
# Load the CSV file created in Part 1 into a Pandas DataFrame
city_data_df = pd.read_csv("output_data/cities.csv")

# Display sample data
city_data_df.head()
```

	City_ID	City	Lat	Lng	Max Temp	Humidity	Cloudiness	Wind Speed	Country	Date
0	0	faya	18.3851	42.4509	22.06	35	21	2.60	SA	1666108228
1	1	farsund	58.0948	6.8047	13.30	100	0	7.65	NO	1666108228
2	2	new norfolk	-42.7826	147.0587	11.72	58	12	1.34	AU	1666108230
3	3	jamestown	42.0970	-79.2353	5.77	77	100	9.77	US	1666107934
4	4	lanzhou	36.0564	103.7922	14.53	48	59	1.20	CN	1666108230

```python
# Review the data set for missing data and type
city_data_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 577 entries, 0 to 576
Data columns (total 10 columns):
 #   Column      Non-Null Count  Dtype
---  ------      --------------  -----
 0   City_ID     577 non-null    int64
 1   City        577 non-null    object
 2   Lat         577 non-null    float64
 3   Lng         577 non-null    float64
 4   Max Temp    577 non-null    float64
 5   Humidity    577 non-null    int64
 6   Cloudiness  577 non-null    int64
 7   Wind Speed  577 non-null    float64
 8   Country     574 non-null    object
 9   Date        577 non-null    int64
dtypes: float64(4), int64(4), object(2)
memory usage: 45.2+ KB
```
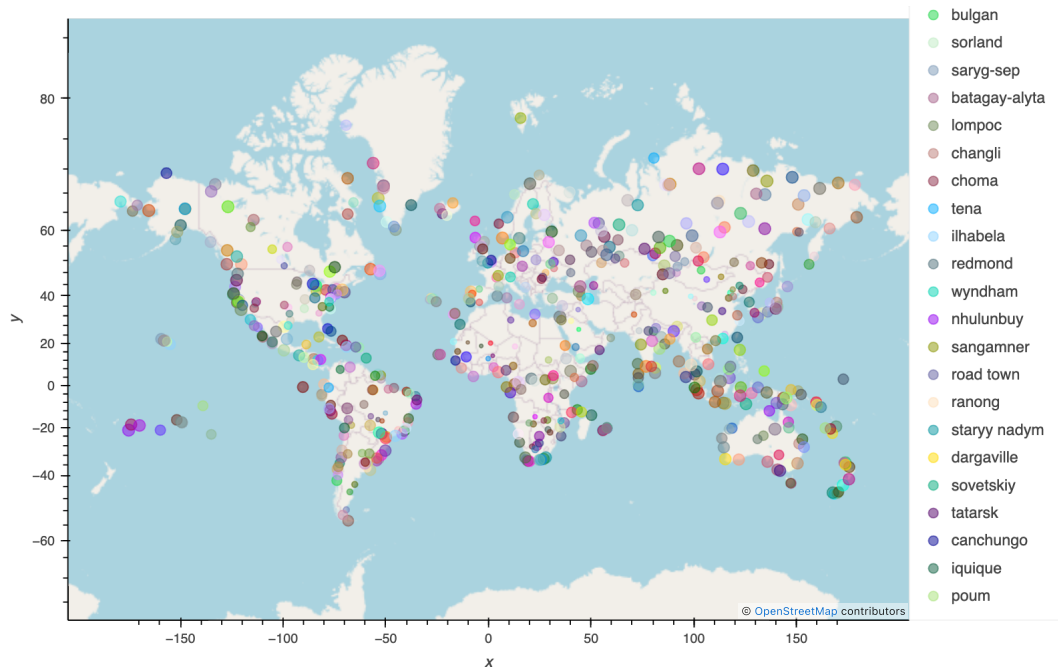
Step 1: Create a map that displays a point for every city in the `city_data_df` DataFrame. The size of the point should be the humidity in each city.

```python
%%capture --no-display

# Configure the map plot
map_plot_city = city_data_df.hvplot.points(
    "Lng",
    "Lat",
    geo = True,
    size = "Humidity",
    scale = 1,
    color = "City",
    alpha = 0.5,
    tiles = "OSM",
    frame_width = 700,
    frame_height = 500
)

# Display the map
map_plot_city
```

Step 2: Narrow down the `city_data_df` DataFrame to find your ideal weather condition

```python
# Narrow down cities that fit criteria and drop any results with null values

#reduce cities to ideal conditions
preferred_cities_df = city_data_df.loc[(city_data_df["Wind Speed"]<= 4.5) & (city_data_df["Cloudiness"] == 0) &
                        (city_data_df["Max Temp"]>= 21) & (city_data_df["Max Temp"]<= 27)].dropna()

# (cities_df["Humidity"]<= 80) &
preferred_cities_df
```

In [6]:

Out[6]:

	City_ID	City	Lat	Lng	Max Temp	Humidity	Cloudiness	Wind Speed	Country	Date
45	45	kapaa	22.0752	-159.3190	22.99	84	0	3.60	US	1666108257
51	51	hilo	19.7297	-155.0900	26.27	83	0	2.57	US	1666108260
63	63	banda	25.4833	80.3333	24.62	52	0	2.68	IN	1666108268
81	81	makakilo city	21.3469	-158.0858	21.66	81	0	2.57	US	1666108282
152	152	kahului	20.8947	-156.4700	23.80	60	0	3.09	US	1666108246
197	197	gat	31.6100	34.7642	24.38	100	0	3.69	IL	1666108356
211	211	laguna	38.4210	-121.4238	21.67	79	0	2.06	US	1666108364
240	240	tikaitnagar	26.9500	81.5833	23.56	59	0	0.35	IN	1666108378
265	265	san quintin	30.4833	-115.9500	21.20	74	0	1.37	MX	1666108394
340	340	santa rosalia	27.3167	-112.2833	24.62	56	0	0.74	MX	1666108436
363	363	narwar	25.6500	77.9000	22.35	55	0	1.29	IN	1666108449
375	375	port hedland	-20.3167	118.5667	21.03	73	0	3.09	AU	1666108455
381	381	roebourne	-20.7833	117.1333	23.48	65	0	2.95	AU	1666108458
391	391	saint-francois	46.4154	3.9054	23.69	57	0	4.12	FR	1666108465
409	409	capoterra	39.1763	8.9718	24.84	71	0	3.60	IT	1666108477
421	421	stolac	43.0844	17.9575	24.88	68	0	0.80	BA	1666108483
516	516	guerrero negro	27.9769	-114.0611	23.17	68	0	0.89	MX	1666108537

Step 3: Create a new DataFrame called `hotel_df`.

In [7]:

```python
# Use the Pandas copy function to create DataFrame called hotel_df to store the city, country, coordinates, and humidity
hotel_df = preferred_cities_df[["City","Country", "Lat", "Lng"]].copy()

# Add a "Hotel Name" column to the DataFrame.
hotel_df["Hotel Name"] = ""

# Display the result
hotel_df
```

	City	Country	Lat	Lng	Hotel Name
45	kapaa	US	22.0752	-159.3190	
51	hilo	US	19.7297	-155.0900	
63	banda	IN	25.4833	80.3333	
81	makakilo city	US	21.3469	-158.0858	
152	kahului	US	20.8947	-156.4700	
197	gat	IL	31.6100	34.7642	
211	laguna	US	38.4210	-121.4238	
240	tikaitnagar	IN	26.9500	81.5833	
265	san quintin	MX	30.4833	-115.9500	
340	santa rosalia	MX	27.3167	-112.2833	
363	narwar	IN	25.6500	77.9000	
375	port hedland	AU	-20.3167	118.5667	
381	roebourne	AU	-20.7833	117.1333	
391	saint-francois	FR	46.4154	3.9054	
409	capoterra	IT	39.1763	8.9718	
421	stolac	BA	43.0844	17.9575	
516	guerrero negro	MX	27.9769	-114.0611	

Step 4: For each city, use the Geoapify API to find the first hotel located within 10,000 metres of your coordinates.

In [10]:
```
name_address
```

```
Out[10]: {'type': 'FeatureCollection',
          'features': [{'type': 'Feature',
            'properties': {'name': 'Plaza sal paraiso',
             'street': 'Calle Sergio Noyola N.',
             'city': 'Guerrero Negro',
             'county': 'Municipio de Mulegé',
             'state': 'Lower California South',
             'country': 'Mexico',
             'country_code': 'mx',
             'lon': -114.0459381,
             'lat': 27.9705567,
             'formatted': 'Plaza sal paraiso, Calle Sergio Noyola N., Guerrero Negro, Lower California South, Mexico',
             'address_line1': 'Plaza sal paraiso',
             'address_line2': 'Calle Sergio Noyola N., Guerrero Negro, Lower California South, Mexico',
             'categories': ['accommodation', 'accommodation.hotel'],
             'details': ['details'],
             'datasource': {'sourcename': 'openstreetmap',
              'attribution': '© OpenStreetMap contributors',
              'license': 'Open Database Licence',
              'url': 'https://www.openstreetmap.org/copyright',
              'raw': {'name': 'Plaza sal paraiso',
               'osm_id': 4562814990,
               'name:es': 'Plaza sal paraiso',
               'tourism': 'hotel',
               'osm_type': 'n'}},
             'distance': 1649,
             'place_id': '51fb485ba6f0825cc0596932656776f83b40f00103f9010e08f70f01000000920311506c617a612073616c207061726169736f'},
            'geometry': {'type': 'Point',
             'coordinates': [-114.04593809999999, 27.97055669994953]}},
           {'type': 'Feature',
            'properties': {'name': 'Cabanas Malarrimo',
             'street': 'Pipilia',
             'city': 'Guerrero Negro',
             'county': 'Municipio de Mulegé',
             'state': 'Lower California South',
             'country': 'Mexico',
             'country_code': 'mx',
             'lon': -114.03025749397281,
             'lat': 27.96805955,
             'formatted': 'Cabanas Malarrimo, Pipilia, Guerrero Negro, Lower California South, Mexico',
             'address_line1': 'Cabanas Malarrimo',
             'address_line2': 'Pipilia, Guerrero Negro, Lower California South, Mexico',
             'categories': ['accommodation',
              'accommodation.hotel',
              'building',
              'building.accommodation',
              'internet_access',
              'internet_access.free'],
             'details': ['details', 'details.contact', 'details.facilities'],
             'datasource': {'sourcename': 'openstreetmap',
              'attribution': '© OpenStreetMap contributors',
              'license': 'Open Database Licence',
              'url': 'https://www.openstreetmap.org/copyright',
              'raw': {'name': 'Cabanas Malarrimo',
               'email': 'info@malarrimo.com',
               'osm_id': 142391188,
               'tourism': 'hotel',
               'website': 'malarrimo.com',
               'building': 'yes',
               'osm_type': 'w',
               'internet_access': 'yes',
               'internet_access:fee': 'no'}},
             'distance': 3173,
             'place_id': '51dec5e0d1ed815cc059b695762ad5f73b40f00102f90194b77c0800000000920311436162616e6173204d616c617272696d6f'},
            'geometry': {'type': 'Point',
             'coordinates': [-114.03014037085038, 27.96809640307557]}},
           {'type': 'Feature',
            'properties': {'name': 'Los Caracoles',
             'street': 'Avenida Emiliano Zapata',
             'city': 'Guerrero Negro',
             'county': 'Municipio de Mulegé',
             'state': 'Lower California South',
             'country': 'Mexico',
             'country_code': 'mx',
             'lon': -114.0281018,
             'lat': 27.9677748,
             'formatted': 'Los Caracoles, Avenida Emiliano Zapata, Guerrero Negro, Lower California South, Mexico',
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             'address_line2': 'Avenida Emiliano Zapata, Guerrero Negro, Lower California South, Mexico',
             'categories': ['accommodation', 'accommodation.hotel'],
             'details': ['details'],
             'datasource': {'sourcename': 'openstreetmap',
              'attribution': '© OpenStreetMap contributors',
              'license': 'Open Database Licence',
              'url': 'https://www.openstreetmap.org/copyright',
              'raw': {'name': 'Los Caracoles',
               'osm_id': 2742883220,
               'name:es': 'Los Caracoles',
               'tourism': 'hotel',
               'osm_type': 'n'}},
             'distance': 3400,
             'place_id': '515cfd7d6bcc815cc05970addb16c0f73b40f00103f90194137da30000000092030d4c6f732043617261636f6c6573'},
            'geometry': {'type': 'Point',
             'coordinates': [-114.0281018, 27.967774799949837]}},
           {'type': 'Feature',
            'properties': {'name': 'Los Caracoles',
             'street': 'Avenida Emiliano Zapata',
             'city': 'Guerrero Negro',
             'county': 'Municipio de Mulegé',
             'state': 'Lower California South',
             'country': 'Mexico',
             'country_code': 'mx',
             'lon': -114.0248887,
             'lat': 27.9680794,
             'formatted': 'Los Caracoles, Avenida Emiliano Zapata, Guerrero Negro, Lower California South, Mexico',
             'address_line1': 'Los Caracoles',
             'address_line2': 'Avenida Emiliano Zapata, Guerrero Negro, Lower California South, Mexico',
             'categories': ['accommodation', 'accommodation.hotel'],
```

```
        'details': [],
        'datasource': {'sourcename': 'openstreetmap',
         'attribution': '© OpenStreetMap contributors',
         'license': 'Open Database Licence',
         'url': 'https://www.openstreetmap.org/copyright',
         'raw': {'name': 'Los Caracoles',
          'osm_id': 736964184,
          'tourism': 'hotel',
          'osm_type': 'n'}},
        'distance': 3694,
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       'geometry': {'type': 'Point',
        'coordinates': [-114.0248887, 27.968079399949804]}},
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       'properties': {'name': 'Hotel TerraSal',
        'street': 'Avenida Emiliano Zapata',
        'suburb': 'Las Perchas',
        'city': 'Guerrero Negro',
        'county': 'Municipio de Mulegé',
        'state': 'Lower California South',
        'country': 'Mexico',
        'country_code': 'mx',
        'lon': -114.0172657,
        'lat': 27.9677014,
        'formatted': 'TerraSal Hotel, Avenida Emiliano Zapata, Las Perchas, Guerrero Negro, Lower California South, Mexico',
        'address_line1': 'TerraSal Hotel',
        'address_line2': 'Avenida Emiliano Zapata, Las Perchas, Guerrero Negro, Lower California South, Mexico',
        'categories': ['accommodation', 'accommodation.hotel', 'internet_access'],
        'details': ['details', 'details.facilities'],
        'datasource': {'sourcename': 'openstreetmap',
         'attribution': '© OpenStreetMap contributors',
         'license': 'Open Database Licence',
         'url': 'https://www.openstreetmap.org/copyright',
         'raw': {'name': 'Hotel TerraSal',
          'osm_id': 5920953885,
          'name:en': 'TerraSal Hotel',
          'tourism': 'hotel',
          'osm_type': 'n',
          'internet_access': 'wlan'}},
        'distance': 4432,
        'place_id': '51ed3598e11a815cc059f9136947bbf73b40f00103f9011d96ea600100000092030e486f74656c20546572726153616c'},
       'geometry': {'type': 'Point',
        'coordinates': [-114.01726570000001, 27.96770139994985]}},
      {'type': 'Feature',
       'properties': {'name': 'Desert Inn',
        'street': 'Carretera Punta Prieta-Guerrero Negro',
        'county': 'Municipio de San Quintín',
        'state': 'Baja California',
        'country': 'Mexico',
        'country_code': 'mx',
        'lon': -114.0140638,
        'lat': 28.0007271,
        'formatted': 'Desert Inn, Carretera Punta Prieta-Guerrero Negro, BCN, Mexico',
        'address_line1': 'Desert Inn',
        'address_line2': 'Carretera Punta Prieta-Guerrero Negro, BCN, Mexico',
        'categories': ['accommodation',
         'accommodation.hotel',
         'catering',
         'catering.restaurant'],
        'details': [],
        'datasource': {'sourcename': 'openstreetmap',
         'attribution': '© OpenStreetMap contributors',
         'license': 'Open Database Licence',
         'url': 'https://www.openstreetmap.org/copyright',
         'raw': {'name': 'Desert Inn',
          'osm_id': 771033368,
          'amenity': 'restaurant',
          'tourism': 'hotel',
          'osm_type': 'n'}},
        'distance': 5327,
        'place_id': '51ad43da6be6805cc0595b7db6a62f003c40f00103f9011809f52d0000000092030a44657365727420496e6e'},
       'geometry': {'type': 'Point',
        'coordinates': [-114.01406379999999, 28.000727099946157]}}]}
```

```
In [9]:  # Set parameters to search for a hotel
         radius = 10000
         params = {
             "apiKey":geoapify_key
         }

         # Print a message to follow up the hotel search
         print("Starting hotel search")
         print("--------------------")

         # Iterate through the hotel_df DataFrame
         for index, row in hotel_df.iterrows():

             # get latitude, longitude from the DataFrame
             latitude = hotel_df.loc[index, "Lat"]
             longitude = hotel_df.loc[index, "Lng"]

             # Add filter and bias parameters with the current city's latitude and longitude to the params dictionary
             params["filter"] = f"circle:{longitude},{latitude},{radius}"
             params["bias"] = f"proximity:{longitude},{latitude}"
             params["categories"] = f"accommodation.hotel"

             # Set base URL
             base_url = "https://api.geoapify.com/v2/places"

             # Make and API request using the params dictionaty
             name_address = requests.get(base_url, params=params)

             # Convert the API response to JSON format
             name_address = name_address.json()

             # Grab the first hotel from the results and store the name in the hotel_df DataFrame
             try:
                 hotel_df.loc[index, "Hotel Name"] = name_address["features"][0]["properties"]["name"]
```

```
    except(KeyError, IndexError):
        # If no hotel is found, set the hotel name as "No hotel found".
        hotel_df.loc[index, "Hotel Name"] = "No hotel found"

    # Log the search results
    print(f"{hotel_df.loc[index, 'City']} - nearest hotel: {hotel_df.loc[index, 'Hotel Name']}")

# Display sample data
hotel_df
```

```
Starting hotel search
---------------------
kapaa - nearest hotel: Pono Kai Resort
hilo - nearest hotel: Dolphin Bay Hotel
banda - nearest hotel: #acnindiafy21
makakilo city - nearest hotel: Embassy Suites by Hilton Oahu Kapolei
kahului - nearest hotel: Maui Seaside Hotel
gat - nearest hotel: No hotel found
laguna - nearest hotel: Holiday Inn Express & Suites
tikaitnagar - nearest hotel: No hotel found
san quintin - nearest hotel: Jardines Hotel
santa rosalia - nearest hotel: Hotel del Real
narwar - nearest hotel: No hotel found
port hedland - nearest hotel: The Esplanade Hotel
roebourne - nearest hotel: No hotel found
saint-francois - nearest hotel: Chez Lily
capoterra - nearest hotel: Rosa Hotel
stolac - nearest hotel: Bregava
guerrero negro - nearest hotel: Plaza sal paraiso
```

Out[9]:

	City	Country	Lat	Lng	Hotel Name
45	kapaa	US	22.0752	-159.3190	Pono Kai Resort
51	hilo	US	19.7297	-155.0900	Dolphin Bay Hotel
63	banda	IN	25.4833	80.3333	#acnindiafy21
81	makakilo city	US	21.3469	-158.0858	Embassy Suites by Hilton Oahu Kapolei
152	kahului	US	20.8947	-156.4700	Maui Seaside Hotel
197	gat	IL	31.6100	34.7642	No hotel found
211	laguna	US	38.4210	-121.4238	Holiday Inn Express & Suites
240	tikaitnagar	IN	26.9500	81.5833	No hotel found
265	san quintin	MX	30.4833	-115.9500	Jardines Hotel
340	santa rosalia	MX	27.3167	-112.2833	Hotel del Real
363	narwar	IN	25.6500	77.9000	No hotel found
375	port hedland	AU	-20.3167	118.5667	The Esplanade Hotel
381	roebourne	AU	-20.7833	117.1333	No hotel found
391	saint-francois	FR	46.4154	3.9054	Chez Lily
409	capoterra	IT	39.1763	8.9718	Rosa Hotel
421	stolac	BA	43.0844	17.9575	Bregava
516	guerrero negro	MX	27.9769	-114.0611	Plaza sal paraiso

Step 5: Add the hotel name and the country as additional information in the hover message for each city in the map.
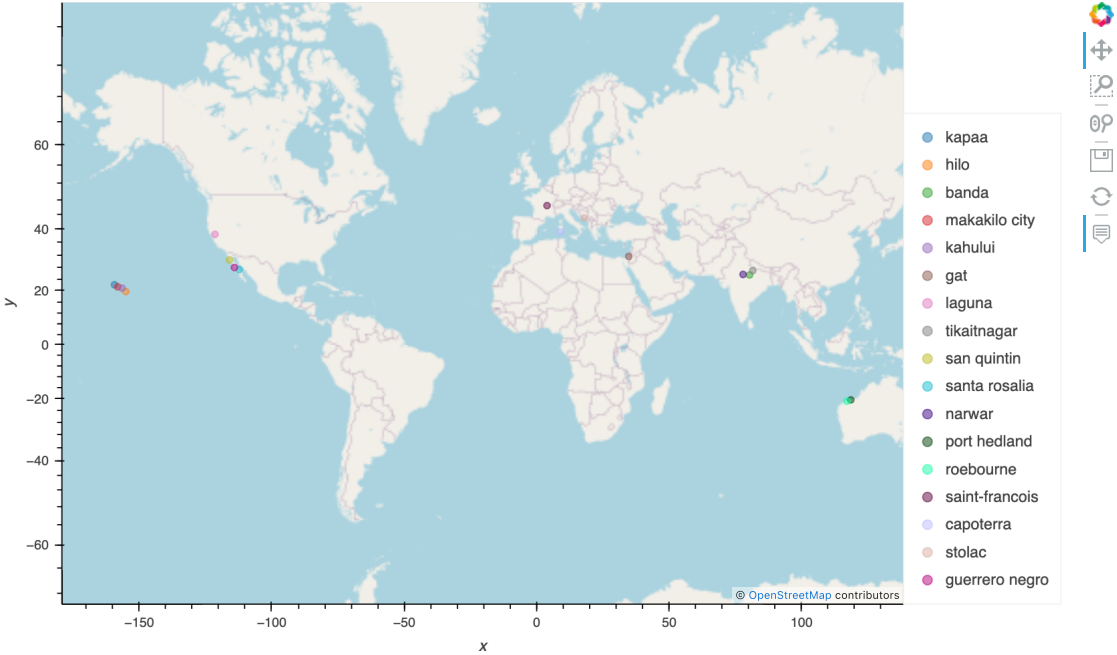
In [21]:
```
%%capture --no-display

# Configure the map plot
map_plot_hotel = hotel_df.hvplot.points(
    "Lng",
    "Lat",
    geo = True,
    scale = 5,
    color = "City",
    alpha = 0.5,
    tiles = "OSM",
    frame_width = 700,
    frame_height = 500
)

# Display the map
map_plot_hotel
```