```
import folium

# Coordinates from earlier data (approximate locations for the individuals)
locations = {
    "Pictou": (45.543238, -62.666417),
    "Inverness": (46.537269, -61.055994),
    "Cape Breton": (46.135109, -60.172928),
    "Cumberland": (45.650522, -64.060595),
    "Cape Breton": (46.152498, -60.178935),
    "Cape Breton": (46.261618, -60.254962),
    "Yarmouth": (43.8271, -66.119302),
    "Colchester": (45.359487, -63.278571),
    "Lunenburg": (44.294391, -64.324932),
    "Halifax": (44.671237, -63.612627),
    "Lunenburg": (44.376453, -64.301968),
    "Halifax": (44.72348, -63.739062),
    "Hants": (44.975006, -64.127454),
    "Guysborough": (45.337274, -61.001514),
    "Pictou": (45.675657, -62.723432),
    "Cape Breton": (46.1959, -59.970987),
    "Halifax": (44.782216, -63.689245),
    "Cape Breton": (45.982886, -60.211082),
    "Annapolis": (44.890907, -65.149837),
    "Lunenburg": (44.384917, -64.507279),
    "Cape Breton": (46.185808, -59.871441),
    "Cape Breton": (46.248052, -60.087946),
    "Pictou": (45.556812, -62.667521),
    "Colchester": (45.36532, -63.275631),
    "Cape Breton": (46.241993, -60.080484),
    "Cape Breton": (46.122724, -60.196319),
    "Hants": (45.317299, -63.502503),
    "Queens": (44.036375, -64.708266),
    "Inverness": (46.231683, -61.302422),
    "Kings": (45.035165, -64.728666),
    "Yarmouth": (43.661154, -65.801384),
    "Yarmouth": (43.824588, -66.122376),
    "Pictou": (45.595175, -62.648775),
    "Yarmouth": (43.853559, -66.108126),
    "Kings": (45.065447, -64.454845),
    "Inverness": (45.901516, -61.094998),
    "Cape Breton": (46.132231, -60.17125),
    "Cape Breton": (46.004525, -59.847511),
    "Digby": (44.242461, -66.130128),
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    "Cumberland": (45.83906, -64.209698),
    "Cumberland (duplicate)": (45.823523, -64.206534),
    "Halifax": (44.571762, -63.560398),
    "Cape Breton": (46.243455, -60.220107),
    "Kings": (44.987819, -64.960415),
    "Pictou": (45.575157, -62.642779),
    "Queens": (44.036614, -64.70867),
    "Colchester": (45.378523, -63.257207),
    "Halifax (duplicate)": (44.676622, -63.493337),
    "Colchester (duplicate)": (45.140913, -63.350021),
    "Pictou (duplicate)": (45.554431, -62.671919),
    "Kings (alternate)": (45.072704, -64.184998),
    "Guysborough": (45.608078, -61.394955),
    "Kings (another)": (45.132501, -64.52906),
    "Victoria": (46.894797, -60.471929),
    "Pictou (another)": (45.56632, -62.719453),
    "Lunenburg": (44.450198, -64.38446),
    "Kings (variant)": (45.028145, -64.838557),
    "Cape Breton (second)": (46.122171, -60.175602),
    "Hants": (45.067785, -64.182336),
    "Cape Breton (third)": (46.163696, -60.181975),
    "Yarmouth": (43.827675, -66.113666),
    "Pictou (fourth)": (45.618565, -62.636492),
    "Cape Breton (fourth)": (46.11025, -60.198955),
    "Colchester (another)": (45.378336, -63.257768),
    "Cape Breton (fifth)": (46.14104, -60.212716),
    "Richmond": (45.512695, -60.959388),
    "Cumberland (variant)": (45.406593, -64.330034),
    "Annapolis": (44.740139, -65.503711),
    "Cape Breton (sixth)": (46.163259, -60.190273),
    "Cape Breton (seventh)": (46.240831, -60.080881),
    "Cape Breton (eighth)": (46.140169, -60.212401),
    "Cumberland (third)": (45.731966, -63.871084),
    "Annapolis (alternate)": (44.839769, -65.284206),
    "Cape Breton (ninth)": (46.143836, -60.194191),
    "Antigonish": (45.624204, -61.995422),
    "Pictou (fifth)": (45.566614, -62.718921),
    "Halifax (third)": (44.672759, -63.565203),
    "Cape Breton (tenth)": (46.179087, -60.02028),
    "Pictou (sixth)": (45.567149, -62.719084),
    "Hants (second)": (44.93804, -63.535932),
    "Hants (third)": (45.294446, -63.747153),
    "Kings (third)": (45.083933, -64.490789),
    "Kings (fourth)": (45.083273, -64.491123),
    "Lunenburg (alternate)": (44.380953, -64.311999),
```

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    "Cumberland (fourth)": (45.406698, -64.329151),
    "Cumberland (fifth)": (45.803171, -64.199857),
    "Cape Breton (eleventh)": (46.138241, -60.162243),
    "Halifax (fourth)": (44.670486, -63.585144),
    "Hants (fourth)": (44.975085, -64.128219),
    "Cape Breton (twelfth)": (46.19465, -60.26341),
    "Halifax (fifth)": (44.66691, -63.571399),
    "Hants (fifth)": (44.894735, -63.833898),
    "Annapolis (second)": (44.890435, -65.150739),
    "Cape Breton (thirteenth)": (46.138098, -60.161274),
    "Cape Breton (fourteenth)": (46.178863, -60.020371),
    "Halifax (sixth)": (44.744331, -63.27838),
    "Cumberland (sixth)": (45.652133, -64.062465),
    "Inverness": (46.395657, -61.074891),
    "Cumberland (seventh)": (45.652724, -64.058438),
    "Cumberland (eighth)": (45.811961, -63.47197),
    "Halifax (seventh)": (44.652811, -63.544116),
    "Halifax (eighth)": (45.044285, -63.148096),
    "Cumberland (ninth)": (45.652935, -64.059126),
    "Richmond (second)": (45.512661, -61.02381),
    "Colchester (third)": (45.418382, -63.602189),
    "Cape Breton (fifteenth)": (46.137822, -60.19621),
    "Richmond (third)": (45.588263, -60.962304),
    "Antigonish (second)": (45.619133, -61.977745),
}

hospital_locations = {
    "Abbie J. Lane Memorial Building": (44.6484, -63.5852),
    "Cape Breton Regional Hospital": (46.1397, -60.1865),
    "Eastern Shore Memorial Hospital": (44.7997, -62.1944),
    "St. Martha's Regional Hospital": (45.6175, -61.9866),
    "Yarmouth Regional Hospital": (43.8419, -66.1214),
    "Halifax Infirmary": (44.6414, -63.5912),
    "Dartmouth General Hospital": (44.6690, -63.5796),
    "Cumberland Regional Health Care Centre": (45.3590, -64.3466),
    "Digby General Hospital": (44.6258, -65.7552),
    "Guysborough Memorial Hospital": (45.3596, -61.5161),
    "Harbourview Hospital": (46.0649, -60.1880),
    "Lillian Fraser Memorial Hospital": (45.6820, -63.3000),
    "All Saints Springhill Hospital": (45.3736, -63.5892),
    "Annapolis Community Health Centre": (44.7410, -65.5291),
    "Northside General Hospital": (46.1065, -60.1961),
    "Nova Scotia Rehabilitation and Arthritis Centre": (44.6421, -63.5885),
    "QEII Cancer Centre": (44.6432, -63.5855),
    "Queens General Hospital": (44.0427, -64.7361),
```

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    "Roseway Hospital": (43.7652, -65.2847),
    "Soldiers Memorial Hospital": (44.9157, -64.5884),
    "St. Mary's Memorial Hospital": (45.3838, -61.3583),
    "Strait Richmond Hospital": (45.7510, -61.4522),
    "Sutherland Harris Memorial Hospital": (45.6944, -62.6350),
    "Twin Oaks Memorial Hospital": (44.9800, -62.5452),
    "Valley Regional Hospital": (45.0728, -64.4430),
}

# Create a map centered around the average coordinates of the individual location
avg_lat = sum(lat for lat, lon in locations.values()) / len(locations)
avg_lon = sum(lon for lat, lon in locations.values()) / len(locations)
map_ = folium.Map(location=[avg_lat, avg_lon], zoom_start=14)

# Add markers for each person (individual locations)
for name, (lat, lon) in locations.items():
    folium.Marker(location=[lat, lon], popup=name).add_to(map_)

# Add markers for hospital locations with red markers
for name, (lat, lon) in hospital_locations.items():
    folium.Marker(location=[lat, lon], popup=name, icon=folium.Icon(color='red')).add_to(map_)

# Display the map
map_
```


```
import folium
from geopy.distance import geodesic
import numpy as np

def nearest_hospital_distance(loc, hospitals):
    return min(geodesic(loc, hosp_loc).kilometers for hosp_loc in hospitals.values(

# Dictionary to store distances from each location to nearest hospital
location_distances = {}

for loc_name, loc_coords in locations.items():
    distance = nearest_hospital_distance(loc_coords, hospital_locations)
    location_distances[loc_name] = distance
```

```
# Calculate average distance for summary
avg_distance = np.mean(list(location_distances.values()))

# Color scale for visualization
def get_color(distance):
    if distance < 10:
        return 'green'
    elif distance < 25:
        return 'orange'
    else:
        return 'red'

# Create a map centered around the average coordinates
avg_lat = sum(lat for lat, lon in locations.values()) / len(locations)
avg_lon = sum(lon for lat, lon in locations.values()) / len(locations)
map_ = folium.Map(location=[avg_lat, avg_lon], zoom_start=7)

# Add markers for individual locations
for name, (lat, lon) in locations.items():
    distance = location_distances[name]
    color = get_color(distance)
    folium.CircleMarker(
        location=[lat, lon],
        radius=5,
        color=color,
        fill=True,
        fill_color=color,
        fill_opacity=0.7,
        popup=f"{name}<br>Distance to nearest hospital: {distance:.2f} km"
    ).add_to(map_)

# Add hospital markers (red)
for name, (lat, lon) in hospital_locations.items():
    folium.Marker(location=[lat, lon], popup=name, icon=folium.Icon(color='red')).a

# Add average distance summary to map
folium.map.Marker(
    [avg_lat, avg_lon],
    icon=folium.DivIcon(
        html=f"""
        <div style="font-family: Arial; color: black; font-size: 14pt">
        Avg. Distance to Nearest Hospital: {avg_distance:.2f} km
        </div>
        """
    )
```

```
).add_to(map_)

# Show map
map_
```