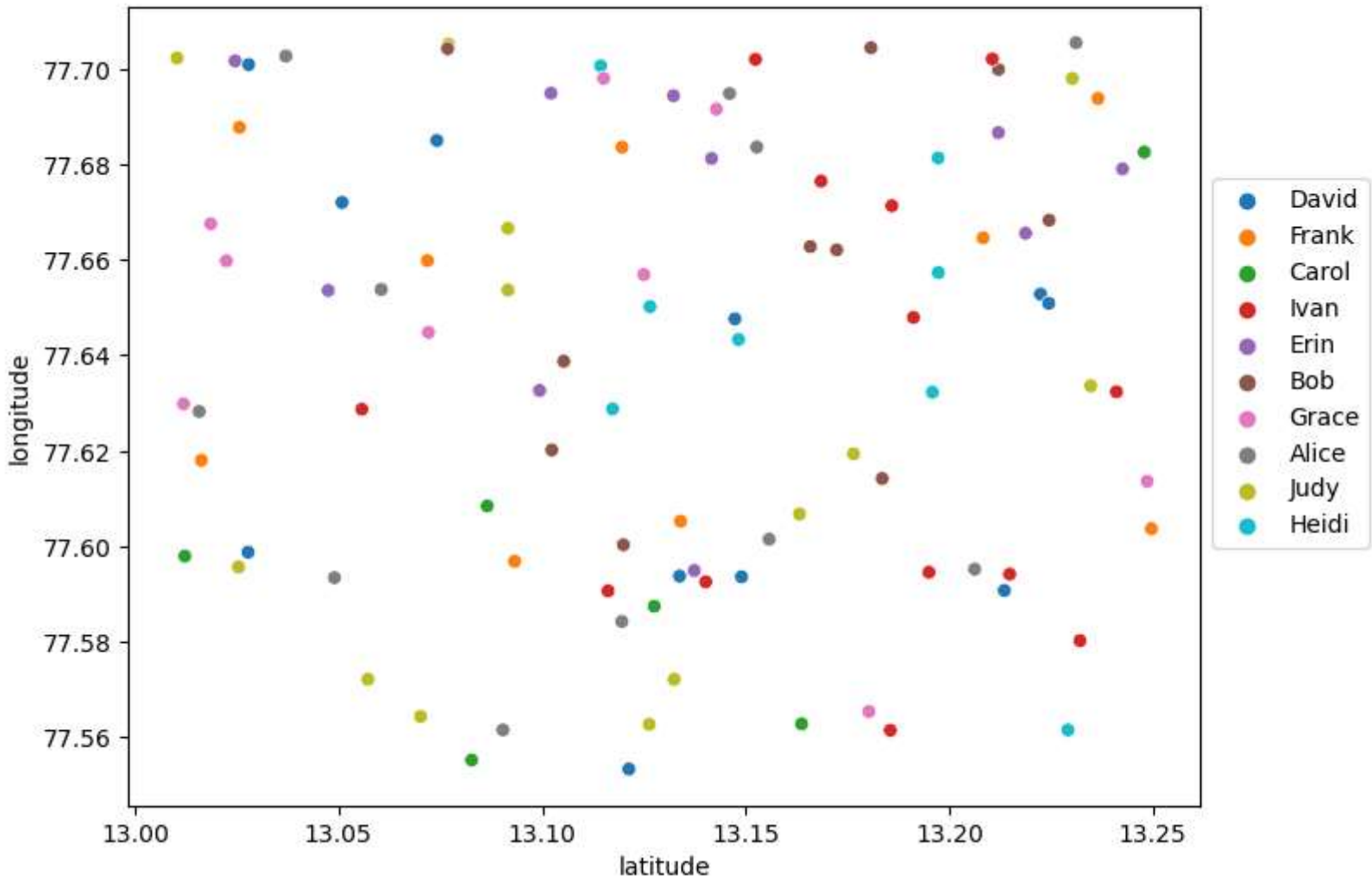
In [17]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import datetime as dt
from sklearn.cluster import DBSCAN
from math import radians
import json
```

In [18]:
```
# Load the JSON data
with open('livedata.json') as f:
    data = json.load(f)
```

In [19]:
```
# Convert the latitude and longitude strings to floats
for entry in data:
    entry['latitude'] = float(entry['latitude'])
    entry['longitude'] = float(entry['longitude'])

df = pd.DataFrame(data)
```

In [20]:
```
plt.figure(figsize=(8,6))
sns.scatterplot(x='latitude', y='longitude', data=df, hue='id')
plt.legend(bbox_to_anchor=[1, 0.8])
plt.show()
```



In [29]:

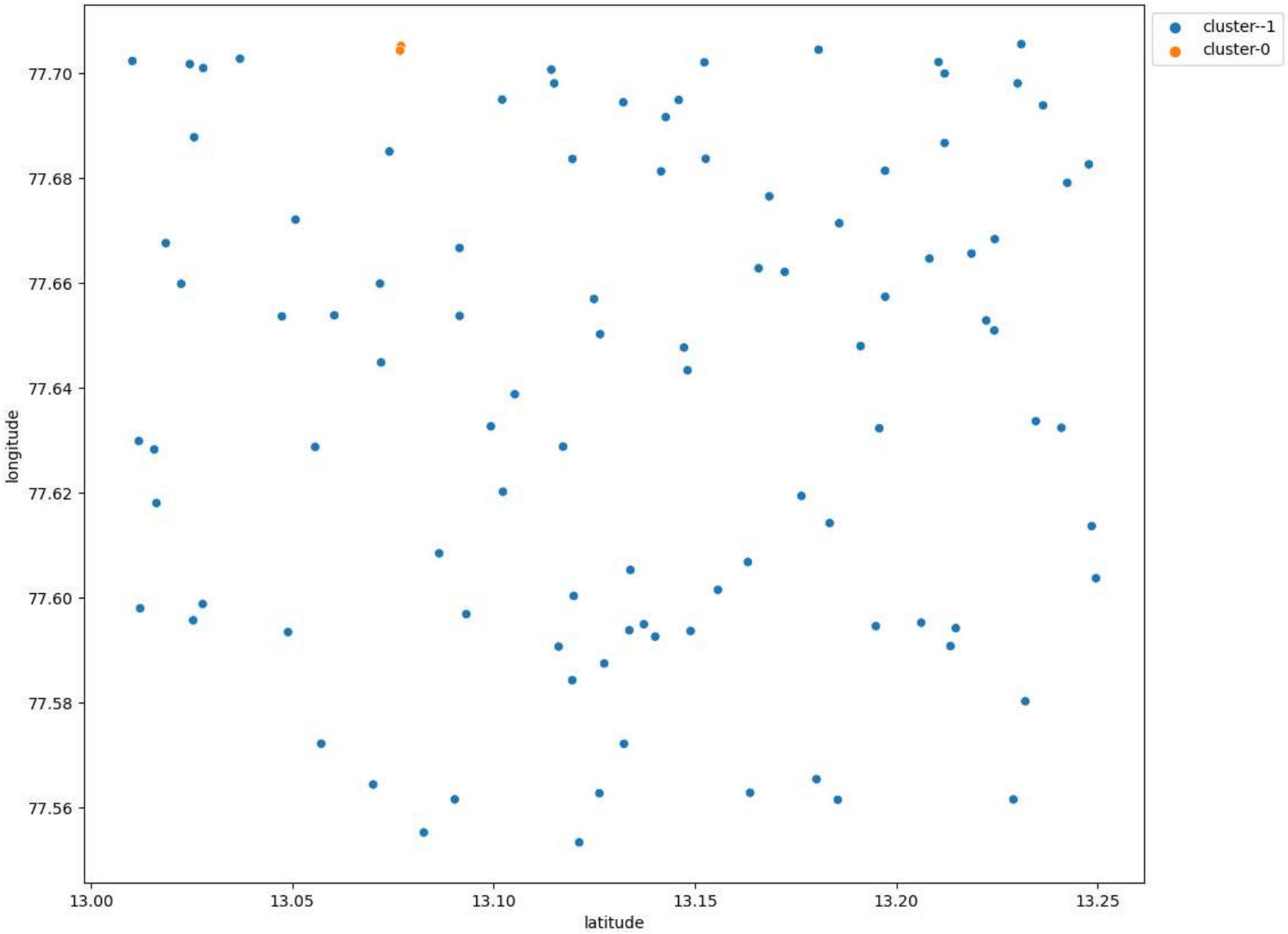
```
def get_infected_names(input_name):
    epsilon = 0.0018288
    model = DBSCAN(eps=epsilon, min_samples=2, metric='haversine').fit(df[['latitude', 'longitude']])
    df['cluster'] = model.labels_.tolist()

    input_name_clusters = []
    for i in range(len(df)):
        if df['id'][i] == input_name:
            if df['cluster'][i] in input_name_clusters:
                pass
            else:
```

```
                input_name_clusters.append(df['cluster'][i])

    infected_names = []
    for cluster in input_name_clusters:
        if cluster != -1:
            ids_in_cluster = df.loc[df['cluster'] == cluster, 'id']
            for i in range(len(ids_in_cluster)):
                member_id = ids_in_cluster.iloc[i]
                if (member_id not in infected_names) and (member_id != input_name):
                    infected_names.append(member_id)
                else:
                    pass
    return infected_names

epsilon = 0.0018288  # Define epsilon here
model = DBSCAN(eps=epsilon, min_samples=2, metric='haversine').fit(df[['latitude', 'longitude']])
df['cluster'] = model.labels_.tolist()
```

In [30]:

```
labels = df['cluster']
fig = plt.figure(figsize=(12,10))
sns.scatterplot(df['latitude'], df['longitude'], hue=['cluster-{}'.format(x) for x in labels])
plt.legend(bbox_to_anchor=[1, 1])
plt.show()
```

```
C:\Users\user\anaconda3\lib\site-packages\seaborn\_decorators.py:36: FutureWarning: Pass the following variables as key
word args: x, y. From version 0.12, the only valid positional argument will be `data`, and passing other arguments with
out an explicit keyword will result in an error or misinterpretation.
  warnings.warn(
```



In [31]:
```
unique_names = set()

# Iterate through the data and add names to the set
for entry in data:
    unique_names.add(entry['id'])
```

```
# Print the unique names
for name in unique_names:
    print(name)
```

```
Grace
David
Frank
Ivan
Bob
Heidi
Erin
Judy
Carol
Alice
```

In [39]:
```
print(get_infected_names("Bob"))
```

```
['Judy']
```

In [ ]: