GeoSpatial Analysis: US Gun Violence

Import Libraries

In [1]:
```
#Import the required libraries
import pandas as pd
import folium
import json
```

Find a GeoJSON File

In [2]:
```
# Download the US states GeoJSON file from https://raw.githubusercontent.com/py
geojson_path = 'us-states.json'  # Replace with the actual path
us_states_geojson = json.load(open(geojson_path))
```

Load and Prepare the Dataset

In [3]:
```
# Step 5: Load and Prepare the Dataset
# Load the gun violence dataset
gun_violence_df = pd.read_csv('gun-violence-data_01-2013_03-2018.csv')
```

Wrangle and Clean Data

In [4]:
```
# Step 5: Wrangle and Clean Data
# Let's perform any necessary data wrangling and cleaning

# For example, you can filter and aggregate the data by state to create the var
state_agg = gun_violence_df.groupby('state')[['n_killed', 'n_injured']].sum().

# Merge the aggregated data with the GeoJSON properties
merged_data = us_states_geojson.copy()
for feature in merged_data['features']:
    state_name = feature['properties']['name']
    state_info = state_agg[state_agg['state'] == state_name]

    if not state_info.empty:
        feature['properties']['killed'] = state_info['n_killed'].iloc[0]
        feature['properties']['injured'] = state_info['n_injured'].iloc[0]
    else:
        feature['properties']['killed'] = 0
        feature['properties']['injured'] = 0
```

Within this code, we are "wrangling" the data and aggregating the results. We are organizing the data on gun violence by state and computing the overall number of people killed and injured in each state. After that, we are going to combine these aggregated data sets with the GeoJSON characteristics so that each state in the GeoJSON will have the appropriate values for the number of people killed and injured.

Create Choropleth Map

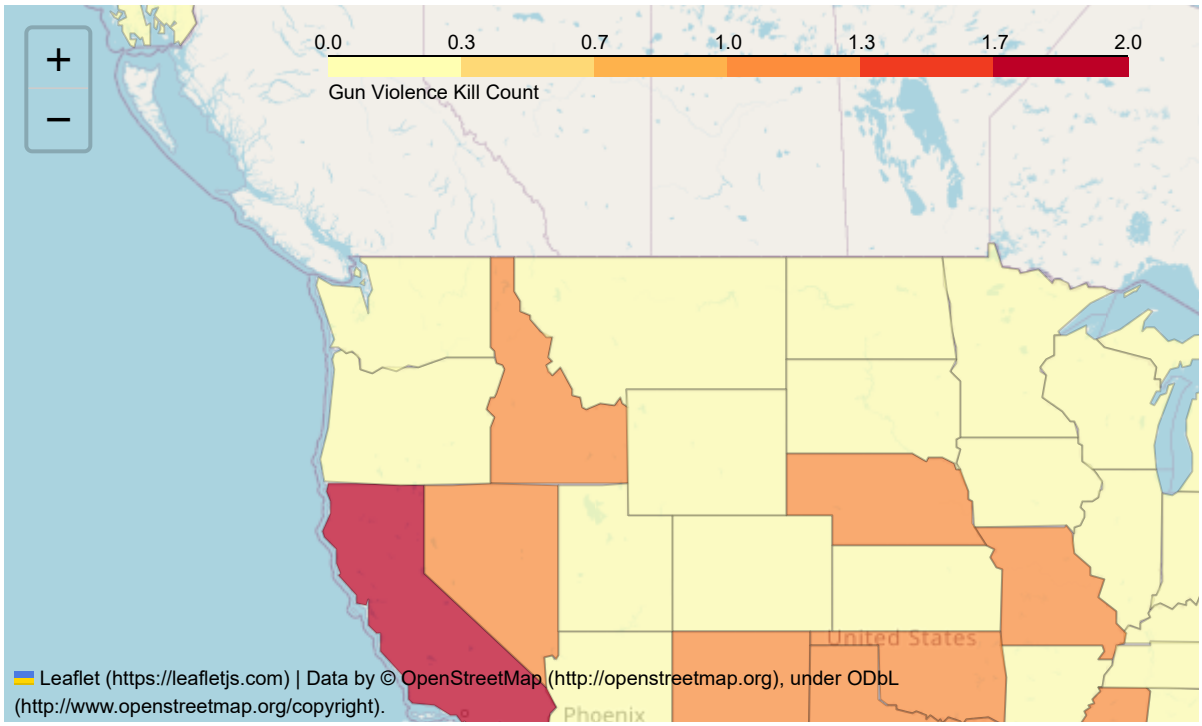
In [5]:
```
# Load the US states GeoJSON file
geojson_path = 'us-states.json'
us_states_geojson = json.load(open(geojson_path))

# Initialize the map
m = folium.Map(location=[37, -95], zoom_start=4)  # Centered at the US

# Create the choropleth layer
folium.Choropleth(
    geo_data=us_states_geojson,
    data=gun_violence_df,  # Your DataFrame
    columns=['state', 'n_killed'],  # Column with state names and variable vali
    key_on='feature.properties.name',  # Key to match the GeoJSON properties
    fill_color='YlOrRd',  # Color scale
    fill_opacity=0.7,
    line_opacity=0.2,
    legend_name='Gun Violence Kill Count',
).add_to(m)

# Display the map
m
```

Out[5]:



Interpretation of Results

Our geospatial analysis of gun violence kill counts per states has yielded some insights. This is how we interpret the results and address the research questions:

Interpretation of Results:

1. **Highest Gun Violence Kill Count:** Los Angeles and Maine have recorded the highest gun violence kill counts among all the states. This means that these states have experienced a relatively higher number of gun violence incidents resulting in fatalities.
2. **Low Gun Violence Kill Count:** States like Oregon and South Dakota have recorded low gun violence kill counts. This suggests that these states have experienced fewer incidents of gun violence resulting in fatalities.

Research Questions:

1. **Existing Research Questions:** If you had research questions related to understanding the variation in gun violence incidents across states, particularly in terms of fatalities, then this analysis answers those questions. For instance, if you were wondering which states have the highest and lowest gun violence kill counts, you now have that information.
2. **New Research Questions:** Based on the analysis, you might want to explore further by asking questions such as:

    - What factors contribute to the higher gun violence kill count in Los Angeles and Maine compared to other states?
    - Are there any patterns in terms of gun control policies, socioeconomic factors, or urbanization that correlate with higher or lower gun violence incidents?
    - Are there particular regions within states that experience higher gun violence incidents, and if so, what might be causing this concentration?
    - How have gun violence trends changed over the years covered by the dataset (January 2013 to March 2018)?

These new research questions can lead you to conduct more in-depth analyses and gather additional data to understand the underlying factors contributing to the observed patterns of gun violence across different states.

Remember that while this analysis provides initial insights, drawing conclusions about causation or correlations requires more comprehensive investigation and possibly additional data sources

Map Output

In [6]:
```
m.save('gun_violence_choropleth.html')
```

In [ ]:
```

```