PS 5

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2024-11-07

Due 11/9 at 5:00PM Central. Worth 100 points + 10 points extra credit.

Submission Steps (10 pts)

1. This problem set is a paired problem set.
2. Play paper, scissors, rock to determine who goes first. Call that person *Partner 1*.
    - Partner 1 (name and cnet ID): Yuting Meng, yutingm
    - Partner 2 (name and cnet ID): Yunzhou Guo, guoy
3. Partner 1 will accept the `ps5` and then share the link it creates with their partner. You can only share it with one partner so you will not be able to change it after your partner has accepted.
4. "This submission is our work alone and complies with the 30538 integrity policy." Add your initials to indicate your agreement: YM, YG
5. "I have uploaded the names of anyone else other than my partner and I worked with on the problem set **here**" (1 point)
6. Late coins used this pset: 0 Late coins left after submission: 3
7. Knit your `ps5.qmd` to an PDF file to make `ps5.pdf`,
    - The PDF should not be more than 25 pages. Use `head()` and re-size figures when appropriate.
8. (Partner 1): push `ps5.qmd` and `ps5.pdf` to your github repo.
9. (Partner 1): submit `ps5.pdf` via Gradescope. Add your partner on Gradescope.
10. (Partner 1): tag your submission in Gradescope

```
import pandas as pd
import altair as alt
import time

import warnings
warnings.filterwarnings('ignore')
alt.renderers.enable("png")
```

```
RendererRegistry.enable('png')
```

```
from bs4 import BeautifulSoup
import requests
```

Step 1: Develop initial scraper and crawler

1. Scraping (PARTNER 1)

```
url = "https://oig.hhs.gov/fraud/enforcement/"

response = requests.get(url)
soup = BeautifulSoup(response.text, 'html.parser')

titles = []
dates = []
categories = []
links = []

for action in soup.select('li.usa-card.card--list.pep-card--minimal'):
    title_tag = action.select_one('h2.usa-card__heading a')
    title = title_tag.get_text(strip=True)
    link = f"https://oig.hhs.gov{title_tag['href']}"

    date = action.select_one('span.text-base-dark').get_text(strip=True)
    category = action.select_one('li.usa-tag').get_text(strip=True)

    titles.append(title)
    dates.append(date)
    categories.append(category)
    links.append(link)
```

```
data = {
    "Title": titles,
    "Date": dates,
    "Category": categories,
    "Link": links
}
df = pd.DataFrame(data)
```

	Title	Date	Category	Link
0	Pharmacist and Brother Convicted of $15M Medic...	November 8, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/pharmaci...
1	Boise Nurse Practitioner Sentenced To 48 Month...	November 7, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/boise-nu...
2	Former Traveling Nurse Pleads Guilty To Tamper...	November 7, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/former-t...
3	Former Arlington Resident Sentenced To Prison ...	November 7, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/former-a...
4	Paroled Felon Sentenced To Six Years For Fraud...	November 7, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/paroled-...
5	Former Licensed Counselor Sentenced For Defrau...	November 6, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/former-l...
6	Macomb County Doctor And Pharmacist Agree To P...	November 4, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/macomb-c...
7	Rocky Hill Pharmacy And Its Owners Indicted Fo...	November 4, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/rocky-hi...
8	North Texas Medical Center Pays $14.2 Million ...	November 4, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/north-te...
9	New England Doctor Pleads Guilty To Drug Distr...	November 4, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/new-engl...
10	Attorney General Alan Wilson Announces Upstate...	November 4, 2024	State Enforcement Agencies	https://oig.hhs.gov/fraud/enforcement/attorney...
11	St. Louis County Woman Accused Of $3 Million H...	November 1, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/st-louis...
12	Lab Owner And Marketing Company Owner Both Fou...	November 1, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/lab-owne...
13	Compound Ingredient Supplier Medisca Inc., To ...	November 1, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/compound...
14	The New Mexico Department Of Justice Charges F...	November 1, 2024	State Enforcement Agencies	https://oig.hhs.gov/fraud/enforcement/the-new-...
15	Nashville Woman Indicted, Charged In TBI Medic...	November 1, 2024	State Enforcement Agencies	https://oig.hhs.gov/fraud/enforcement/nashvill...
16	Michael DePalma, MD and Virginia I-Spine Physi...	October 31, 2024	CMP and Affirmative Exclusions	https://oig.hhs.gov/fraud/enforcement/michael-...
17	Columbus Doctor, His Clinic Convicted of $1.5 ...	October 31, 2024	State Enforcement Agencies	https://oig.hhs.gov/fraud/enforcement/columbus...
18	Mercy Health Youngstown Agreed to Pay $69,000 ...	October 30, 2024	Fraud Self-Disclosures	https://oig.hhs.gov/fraud/enforcement/mercy-he...
19	Quincy-Based Physician Group To Pay $650,000 T...	October 30, 2024	State Enforcement Agencies	https://oig.hhs.gov/fraud/enforcement/quincy-b...

Figure 1: Table 1

2. Crawling (PARTNER 1)

```
titles = []
dates = []
categories = []
links = []
agencies = []
for action in soup.select('li.usa-card.card--list.pep-card--minimal'):
    title_tag = action.select_one('h2.usa-card__heading a')
    title = title_tag.get_text(strip=True)
    link = f"https://oig.hhs.gov{title_tag['href']}"
```

```
    date = action.select_one('span.text-base-dark').get_text(strip=True)
    category = action.select_one('li.usa-tag').get_text(strip=True)

    titles.append(title)
    dates.append(date)
    categories.append(category)
    links.append(link)

    try:
        action_response = requests.get(link)
        action_soup = BeautifulSoup(action_response.text, 'html.parser')

        agency_name = "Not Found"
        for label in action_soup.find_all('span'):
            if "Agency:" in label.get_text():
                agency_name = label.find_next_sibling(text=True).strip() if
 ↪  label.find_next_sibling(text=True) else "Not Found"
                break
    except Exception as e:
        agency_name = "Not Found"

    agencies.append(agency_name)

min_length = min(len(titles), len(dates), len(categories), len(links),
 ↪  len(agencies))
data = {
    "Title": titles[:min_length],
    "Date": dates[:min_length],
    "Category": categories[:min_length],
    "Link": links[:min_length],
    "Agency": agencies[:min_length]
}

df = pd.DataFrame(data)
```

	Title	Date	Category	Link	Agency
0	Pharmacist and Brother Convicted of $15M Medic...	November 8, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/pharmaci...	U.S. Department of Justice
1	Boise Nurse Practitioner Sentenced To 48 Month...	November 7, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/boise-nu...	November 7, 2024; U.S. Attorney's Office, Dist...
2	Former Traveling Nurse Pleads Guilty To Tamper...	November 7, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/former-t...	U.S. Attorney's Office, District of Massachusetts
3	Former Arlington Resident Sentenced To Prison ...	November 7, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/former-a...	U.S. Attorney's Office, Eastern District of Vi...
4	Paroled Felon Sentenced To Six Years For Fraud...	November 7, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/paroled-...	U.S. Attorney's Office, Middle District of Flo...
5	Former Licensed Counselor Sentenced For Defrau...	November 6, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/former-l...	U.S. Attorney's Office, Western District of Texas
6	Macomb County Doctor And Pharmacist Agree To P...	November 4, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/macomb-c...	U.S. Attorney's Office, Eastern District of Mi...
7	Rocky Hill Pharmacy And Its Owners Indicted Fo...	November 4, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/rocky-hi...	U.S. Attorney's Office, Eastern District of Te...
8	North Texas Medical Center Pays $14.2 Million ...	November 4, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/north-te...	U.S. Attorney's Office, Northern District of T...
9	New England Doctor Pleads Guilty To Drug Distr...	November 4, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/new-engl...	U.S. Department of Justice
10	Attorney General Alan Wilson Announces Upstate...	November 4, 2024	State Enforcement Agencies	https://oig.hhs.gov/fraud/enforcement/attorney...	State of South Carolina
11	St. Louis County Woman Accused Of $3 Million H...	November 1, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/st-louis...	U.S. Attorney's Office, Eastern District of Mi...
12	Lab Owner And Marketing Company Owner Both Fou...	November 1, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/lab-owne...	U.S. Attorney's Office, Middle District of Ten...
13	Compound Ingredient Supplier Medisca Inc., To ...	November 1, 2024	Criminal and Civil Actions	https://oig.hhs.gov/fraud/enforcement/compound...	U.S. Department of Justice
14	The New Mexico Department Of Justice Charges F...	November 1, 2024	State Enforcement Agencies	https://oig.hhs.gov/fraud/enforcement/the-new-...	State of New Mexico
15	Nashville Woman Indicted, Charged In TBI Medic...	November 1, 2024	State Enforcement Agencies	https://oig.hhs.gov/fraud/enforcement/nashvill...	State of Tennessee
16	Michael DePalma, MD and Virginia I-Spine Physi...	October 31, 2024	CMP and Affirmative Exclusions	https://oig.hhs.gov/fraud/enforcement/michael-...	Not Found
17	Columbus Doctor, His Clinic Convicted of $1.5 ...	October 31, 2024	State Enforcement Agencies	https://oig.hhs.gov/fraud/enforcement/columbus...	Ohio
18	Mercy Health Youngstown Agreed to Pay $69,000 ...	October 30, 2024	Fraud Self-Disclosures	https://oig.hhs.gov/fraud/enforcement/mercy-he...	Not Found
19	Quincy-Based Physician Group To Pay $650,000 T...	October 30, 2024	State Enforcement Agencies	https://oig.hhs.gov/fraud/enforcement/quincy-b...	State of Massachusetts

Figure 2: Table 2

Step 2: Making the scraper dynamic

1. Turning the scraper into a function

- a. Pseudo-Code (PARTNER 2)

1. Input Validation: Check if the year is greater than or equal to 2013. If the year is less than 2013, print a reminder to restrict the year to >= 2013.
2. URL Construction: Based on the input month and year, construct the starting URL for scraping (e.g., page 1, page 2, etc.). Loop through multiple pages to gather all the data.
3. Scraping and Storing Data: Scrape the enforcement actions from each page (titles, dates, categories, links, agencies). Store the scraped data in lists. After scraping all pages, save the data into a DataFrame.
4. Save to CSV: After scraping all enforcement actions, save the data to a .csv file named enforcement_actions_year_month.csv.

- b. Create Dynamic Scraper (PARTNER 2)

```
import aiohttp
import asyncio
from bs4 import BeautifulSoup
import pandas as pd
from datetime import datetime
import nest_asyncio
```

```
nest_asyncio.apply()

async def fetch(session, url):
    async with session.get(url) as response:
        return await response.text()

async def fetch_agency(session, link):
    """Fetches the agency name from the action detail page."""
    try:
        html = await fetch(session, link)
        soup = BeautifulSoup(html, 'html.parser')

        agency_name = "Not Found"
        for label in soup.find_all('span'):
            if "Agency:" in label.get_text():
                agency_name = label.find_next_sibling(text=True).strip() if
 ↪  label.find_next_sibling(text=True) else "Not Found"
                break
        return agency_name
    except Exception as e:
            print(f"Error fetching agency for {link}: {e}")
            return "Not Found"

async def scrape_page(session, page_number, start_date, titles, dates,
 ↪  categories, links, agencies):
    url = f"https://oig.hhs.gov/fraud/enforcement/?page={page_number}"

    html = await fetch(session, url)
    soup = BeautifulSoup(html, 'html.parser')
    actions = soup.select('li.usa-card.card--list.pep-card--minimal')

    if not actions:
        print(f"No actions found on page {page_number}.")
        return False

    page_reached_start_date = False

    for action in actions:
        title_tag = action.select_one('h2.usa-card__heading a')
        title = title_tag.get_text(strip=True)
        link = f"https://oig.hhs.gov{title_tag['href']}"
```

```
        date_str =
↪   action.select_one('span.text-base-dark').get_text(strip=True)
        action_date = datetime.strptime(date_str, "%B %d, %Y")

        if action_date < start_date:
            page_reached_start_date = True
            break
        category = action.select_one('li.usa-tag').get_text(strip=True)

        titles.append(title)
        dates.append(date_str)
        categories.append(category)
        links.append(link)

        agency_name = await fetch_agency(session, link)
        agencies.append(agency_name)

    return not page_reached_start_date

async def scrape_enforcement_actions(year, month, max_pages=480,
↪   batch_size=10):
    start_date = datetime(year, month, 1)
    titles, dates, categories, links, agencies = [], [], [], [], []

    async with aiohttp.ClientSession() as session:
        for start_page in range(1, max_pages + 1, batch_size):
            tasks = [
                scrape_page(session, page_number, start_date, titles, dates,
↪   categories, links, agencies)
                for page_number in range(start_page, min(start_page +
                ↪   batch_size, max_pages + 1))
            ]

            results = await asyncio.gather(*tasks)
            if not all(results):
                print("Stopping scraping as reached entries before
                ↪   start_date.")
                break

    data = {
        "Title": titles,
        "Date": dates,
```

```
        "Category": categories,
        "Link": links,
        "Agency": agencies
    }
    df = pd.DataFrame(data)
    csv_filename = f"enforcement_actions_{year}_{month}.csv"
    df.to_csv(csv_filename, index=False)

    print(f"Data saved to {csv_filename}")
    print(f"Total records: {len(df)}")
    print(f"Earliest date in data: {df['Date'].iloc[-1] if not df.empty else
    ↪  'No data'}")
    return df

year, month = 2023, 1
await scrape_enforcement_actions(year, month)
```

```
Stopping scraping as reached entries before start_date.
Data saved to enforcement_actions_2023_1.csv
Total records: 1534
Earliest date in data: February 9, 2023
```

	Title	Date	Category
0	South Dakota Surgical Hospital Agrees To Pay M...	September 16, 2024	Criminal and Civil Actio
1	The Rector and Visitors of the University of V...	September 6, 2024	Fraud Self-Disclosures
2	Yavapai Regional Medical Center Agreed to Pay ...	August 27, 2024	Fraud Self-Disclosures
3	Big South Fork Medical Center Agreed to Pay $6...	September 24, 2024	CMP and Affirmative E
4	Dunes Surgical Hospital and USP Siouxland Agre...	September 16, 2024	Fraud Self-Disclosures
...	...	...	...
1529	Owners Of Mobile Phlebotomy Company Plead Guil...	January 23, 2023	Criminal and Civil Actio
1530	Pharmacist Convicted For $1M Prescription Drug...	February 9, 2023	Criminal and Civil Actio
1531	UnityPoint Health-Meriter Agreed to Pay $42,00...	January 23, 2023	Fraud Self-Disclosures
1532	Chicago Man Convicted Of Participating In Ille...	January 20, 2023	Criminal and Civil Actio
1533	Attorney General Alan Wilson Announces Upstate...	February 9, 2023	State Enforcement Agen

There are 1510 records that I got. The earliest date in data was on Feb 7, 2023. Twenty-Three Individuals Charged In $61.5 Mill… February 7, 2023 Criminal and Civil Actions https://oig.hhs.gov/fraud/enforcement/twenty-t… U.S. Department of Justice.

- c. Test Partner's Code (PARTNER 1)

```
year, month = 2021, 1
await scrape_enforcement_actions(year, month, batch_size=50)
```

```
Stopping scraping as reached entries before start_date.
Data saved to enforcement_actions_2021_1.csv
Total records: 3022
Earliest date in data: January 6, 2021
```

	Title	Date	Category
0	SBS Therapy Centers, Cherry Hill CORF, and Was...	February 7, 2024	Fraud Self-Disclosures
1	Brooklyn-Based Home Health Care Agencies Settl...	September 30, 2024	Criminal and Civil Actior
2	Indictment of Joseph Bye, Sara Lapointe, and K...	November 7, 2023	State Enforcement Agenc
3	Laboratory Owner Sentenced to 36 Months in Fed...	September 14, 2023	Criminal and Civil Actior
4	Verdict: Jury Convicts Philadelphia Care Worke...	March 8, 2024	State Enforcement Agenc
...	...	...	...
3017	AG Balderas Secures Conviction of Former Perso...	January 8, 2021	State Enforcement Agenc
3018	Ex-Indian Health Services doctor sentenced to ...	January 7, 2021	Criminal and Civil Actior
3019	Anchorage Doctor Sentenced For Prescribing Med...	January 6, 2021	Criminal and Civil Actior
3020	California Genetic Testing Lab Agrees to Pay $...	January 6, 2021	Criminal and Civil Actior
3021	Barrington Terrace of Boynton Beach Agreed to ...	January 6, 2021	Fraud Self-Disclosures

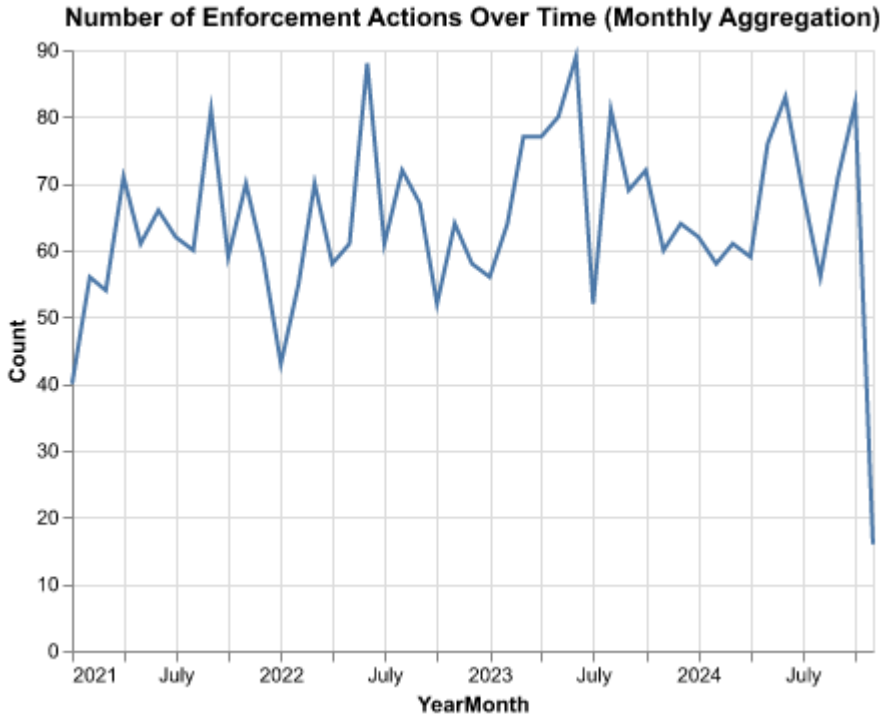
There are 2998 records that I got. The earliest date in data was on September 17, 2021. Gloucester County Man Charged with Fraud for R… September 17, 2021 Criminal and Civil Actions https://oig.hhs.gov/fraud/enforcement/gloucest…

Step 3: Plot data based on scraped data

1. Plot the number of enforcement actions over time (PARTNER 2)

```
import pandas as pd
import altair as alt

df = pd.read_csv('enforcement_actions_2021_1.csv')
df['Date'] = pd.to_datetime(df['Date'])

df['YearMonth'] = df['Date'].dt.to_period('M')
monthly_counts = df.groupby('YearMonth').size().reset_index(name='Count')
monthly_counts['YearMonth'] = monthly_counts['YearMonth'].dt.to_timestamp()
```

```
chart = alt.Chart(monthly_counts).mark_line().encode(
    x='YearMonth:T',
    y='Count:Q',
    tooltip=['YearMonth:T', 'Count:Q']
).properties(
    title="Number of Enforcement Actions Over Time (Monthly Aggregation)",
    width=400,
    height=300
)

chart
```

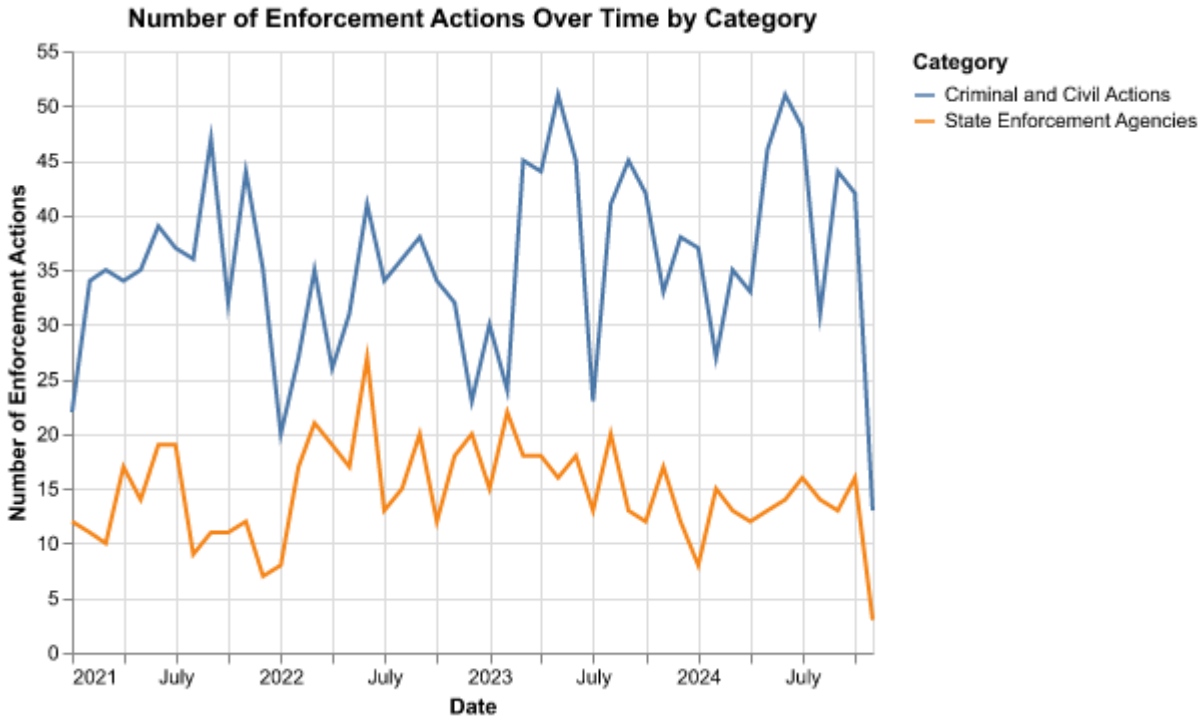


2. Plot the number of enforcement actions categorized: (PARTNER 1)

- based on "Criminal and Civil Actions" vs. "State Enforcement Agencies"

```
df['Date'] = pd.to_datetime(df['Date'])
```

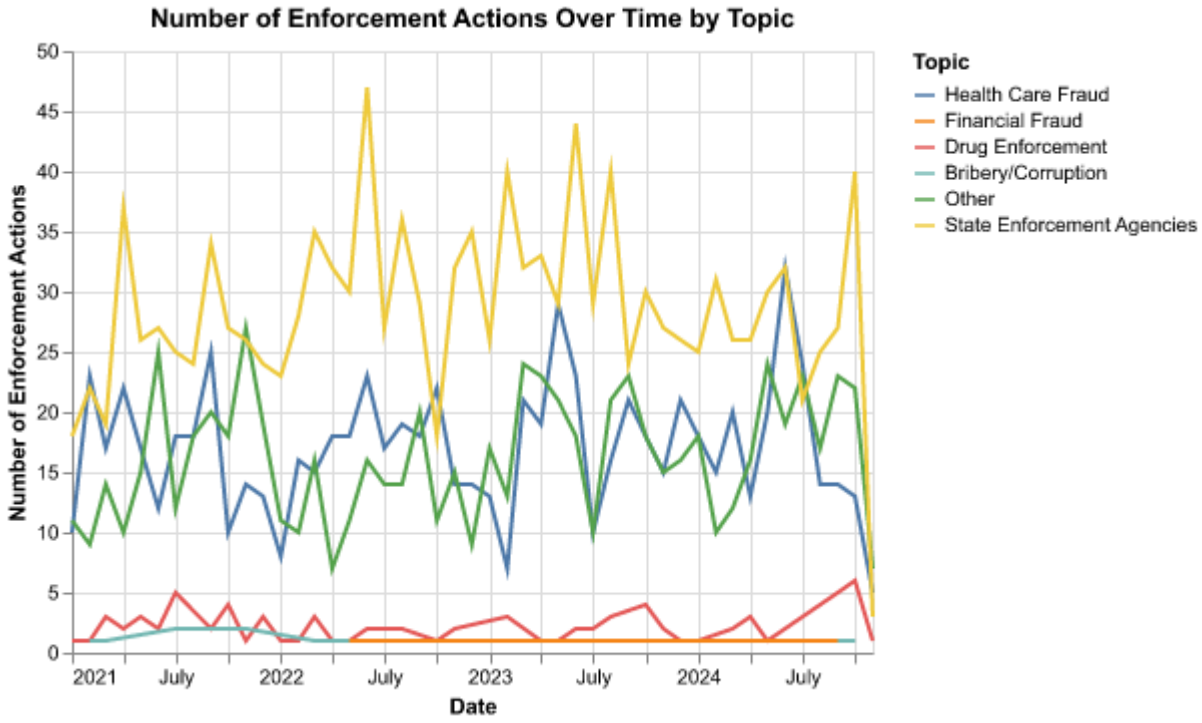
```
df['Year_Month'] = df['Date'].dt.to_period('M')

monthly_counts = df.groupby(['Year_Month',
 ↪  'Category']).size().reset_index(name='Count')
monthly_counts['Year_Month'] = monthly_counts['Year_Month'].dt.to_timestamp()
 ↪

monthly_counts = monthly_counts[monthly_counts['Category'].isin(["Criminal
 ↪  and Civil Actions", "State Enforcement Agencies"])]

line_chart = alt.Chart(monthly_counts).mark_line().encode(
    x=alt.X('Year_Month:T', title='Date'),
    y=alt.Y('Count:Q', title='Number of Enforcement Actions'),
    color=alt.Color('Category:N', title='Category'),
    tooltip=['Year_Month:T', 'Category:N', 'Count:Q']
).properties(
    title='Number of Enforcement Actions Over Time by Category',
    width=400,
    height=300
)

line_chart
```



- based on five topics

```
def classify_topic(title):
    """Classifies each action title into one of the five topics or 'State
     ↪ Enforcement Agencies'."""
    title = title.lower()
    if "health" in title or "care" in title:
        return "Health Care Fraud"
    elif "financial" in title or "bank" in title or "money" in title:
        return "Financial Fraud"
    elif "drug" in title or "narcotics" in title:
        return "Drug Enforcement"
    elif "bribery" in title or "corruption" in title or "bribe" in title:
        return "Bribery/Corruption"
    else:
        return "Other"

df['Topic'] = df.apply(
    lambda row: classify_topic(row['Title']) if row['Category'] == "Criminal
     ↪ and Civil Actions" else "State Enforcement Agencies",
    axis=1
```

```
)

monthly_counts = df.groupby(['Year_Month',
 ↪  'Topic']).size().reset_index(name='Count')
monthly_counts['Year_Month'] = monthly_counts['Year_Month'].dt.to_timestamp()

line_chart = alt.Chart(monthly_counts).mark_line().encode(
    x=alt.X('Year_Month:T', title='Date'),
    y=alt.Y('Count:Q', title='Number of Enforcement Actions'),
    color=alt.Color('Topic:N', title='Topic', scale=alt.Scale(domain=[
        "Health Care Fraud", "Financial Fraud", "Drug Enforcement",
        "Bribery/Corruption", "Other", "State Enforcement Agencies"
    ])),
    tooltip=['Year_Month:T', 'Topic:N', 'Count:Q']
).properties(
    title='Number of Enforcement Actions Over Time by Topic',
    width=400,
    height=300
)

line_chart
```



Step 4: Create maps of enforcement activity

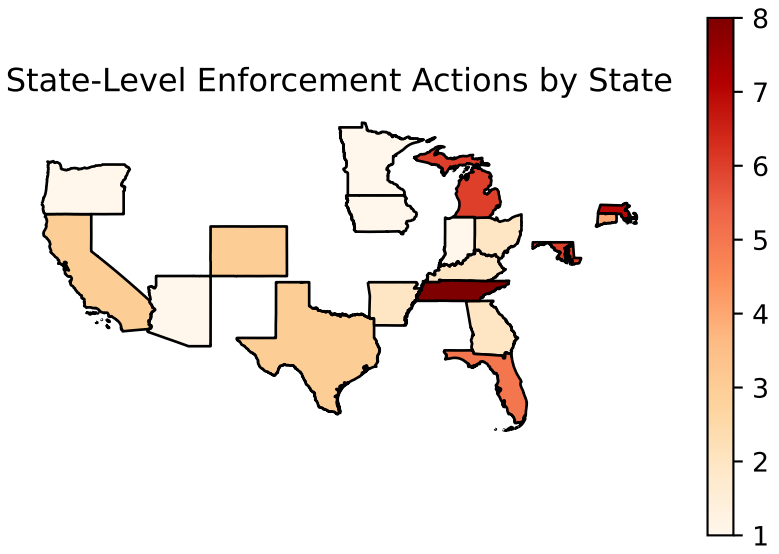
1. Map by State (PARTNER 1)

```
import geopandas as gpd
import matplotlib.pyplot as plt

enforcement_data = pd.read_csv('enforcement_actions_2023_1.csv')

state_shapefile_path = 'cb_2018_us_state_5m.shp'
states = gpd.read_file(state_shapefile_path)
```

```
state_actions =
 ↪  enforcement_data[enforcement_data['Agency'].str.contains("State of",
 ↪  na=False)]

state_actions['State'] = state_actions['Agency'].str.extract(r"State of
 ↪  (\w+)")
state_actions['State'] = state_actions['State'].str.strip()
```

```
state_counts = state_actions['State'].value_counts().reset_index()
state_counts.columns = ['State', 'Enforcement_Count']

state_choropleth = states.merge(state_counts, how="left", left_on="NAME",
 ↪  right_on="State")

plt.figure(figsize=(15, 10))
state_choropleth.plot(column='Enforcement_Count', cmap='OrRd', legend=True,
 ↪  edgecolor="black")
plt.title("State-Level Enforcement Actions by State")
plt.axis("off")
plt.show()
```

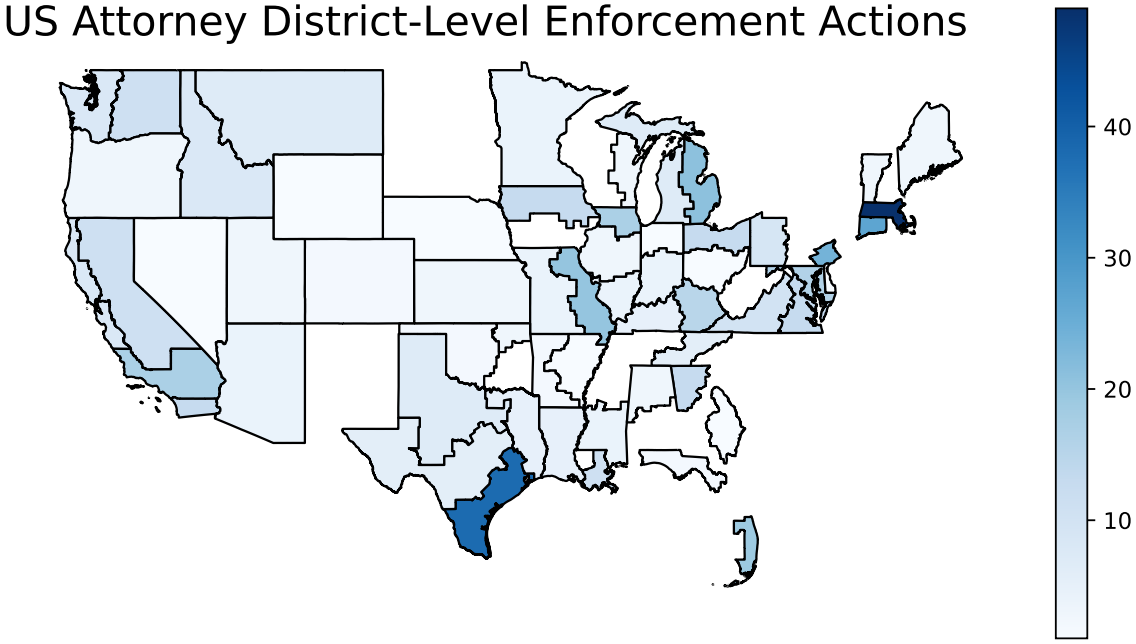
```
<Figure size 4500x3000 with 0 Axes>
```



2. Map by District (PARTNER 2)

```
import re

district_shapefile_path =
 ↪  'geo_export_fcd06d4e-838a-449a-979d-dfc51a522ff4.shp'
district = gpd.read_file(district_shapefile_path)
```

```
enforcement_data = pd.read_csv('enforcement_actions_2023_1.csv')

district_actions =
 ↪  enforcement_data[enforcement_data['Agency'].str.contains("District",
 ↪  na=False)]

district_names =
 ↪  district_actions['Agency'].str.extract(r"(Western|Eastern|Northern|Southern|Central)?\s?D
 ↪  of (\w+)")

district_actions['District'] = district_names[0].fillna('') + ' District of '
 ↪  + district_names[1]

district_counts = district_actions['District'].value_counts().reset_index()
district_counts.columns = ['District', 'Enforcement_Count']

district_counts['District'] = district_counts['District'].str.strip()
district['judicial_d'] = district['judicial_d'].str.strip()

district_choropleth = district.merge(district_counts, how="left",
 ↪  left_on="judicial_d", right_on="District")

fig, ax = plt.subplots(figsize=(10, 5))

district_choropleth.plot(column='Enforcement_Count', cmap='Blues',
 ↪  legend=True, edgecolor="black", ax=ax)

ax.set_xlim(-130, -65)
ax.set_ylim(24, 50)

plt.title("US Attorney District-Level Enforcement Actions", fontsize=18)
plt.axis("off")

plt.show()
```


US Attorney District-Level Enforcement Actions
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