Economic Atlas of Rural and Small-Town America

Data Science Boothcamp
Project 3 Group 12

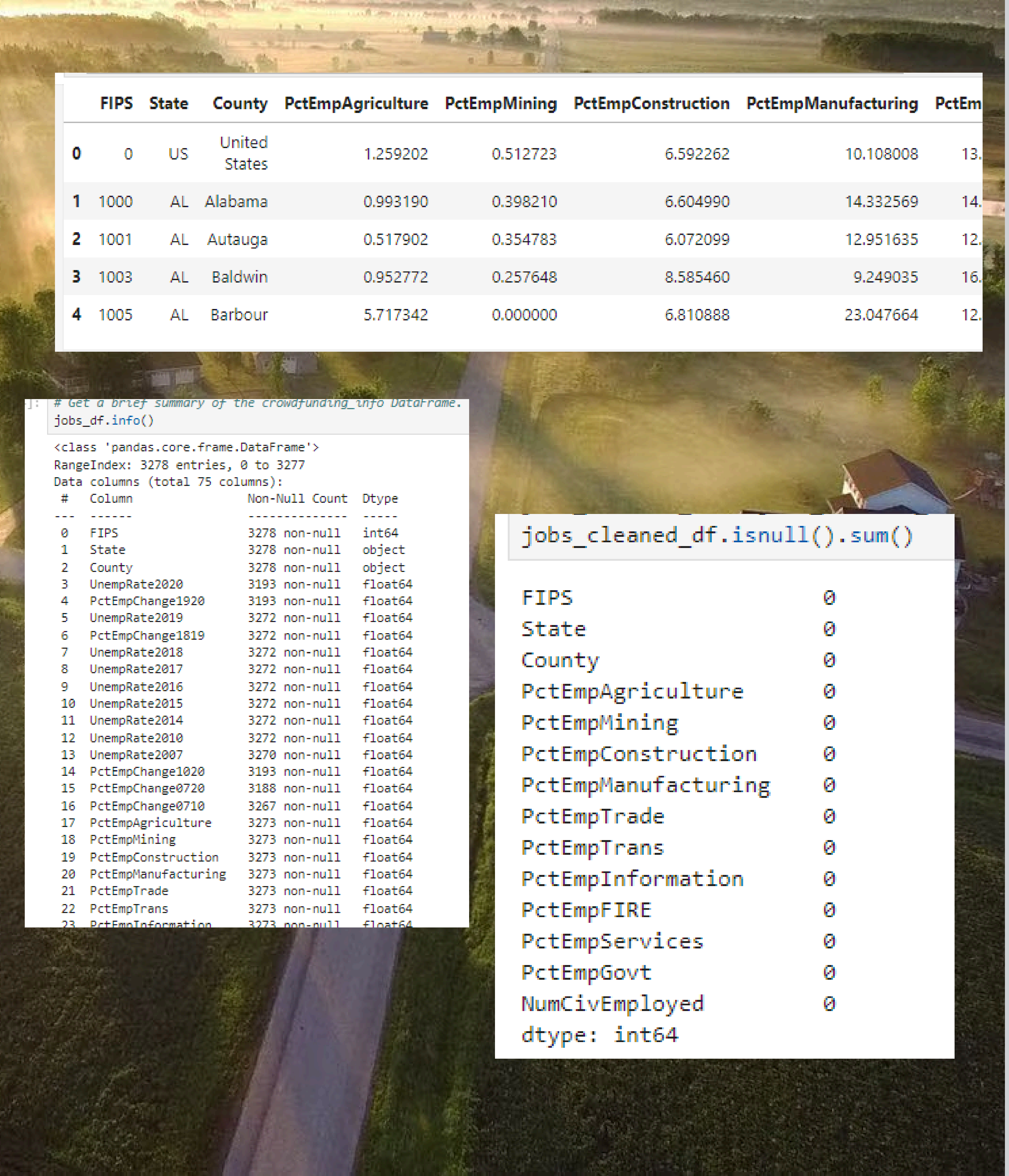
Team Members

- Joyce Weishan
- Paris Lee
- Sam Hoemann
- Laura Zapata

Introduction

- Rural and small-town America plays a vital role in the nation's socioeconomic landscape.
- The Economic Atlas of Rural and Small-Town America provides essential data on, highlighting the unique challenges and opportunities in these areas.
- Understanding and addressing these economic factors is crucial for fostering balanced national growth and improving the quality of life in rural communities.

Data Cleaning



	FIPS	State	County	PctEmpAgriculture	PctEmpMining	PctEmpConstruction	PctEmpManufacturing	PctEm
0	0	US	United States	1.259202	0.512723	6.592262	10.108008	13.
1	1000	AL	Alabama	0.993190	0.398210	6.604990	14.332569	14.
2	1001	AL	Autauga	0.517902	0.354783	6.072099	12.951635	12.
3	1003	AL	Baldwin	0.952772	0.257648	8.585460	9.249035	16.
4	1005	AL	Barbour	5.717342	0.000000	6.810888	23.047664	12.

```
# Get a brief summary of the crowdfunding_info DataFrame.
jobs_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 3278 entries, 0 to 3277
Data columns (total 75 columns):
 #   Column                Non-Null Count  Dtype
---  ------                --------------  -----
 0   FIPS                  3278 non-null   int64
 1   State                 3278 non-null   object
 2   County                3278 non-null   object
 3   UnempRate2020         3193 non-null   float64
 4   PctEmpChange1920      3193 non-null   float64
 5   UnempRate2019         3272 non-null   float64
 6   PctEmpChange1819      3272 non-null   float64
 7   UnempRate2018         3272 non-null   float64
 8   UnempRate2017         3272 non-null   float64
 9   UnempRate2016         3272 non-null   float64
 10  UnempRate2015         3272 non-null   float64
 11  UnempRate2014         3272 non-null   float64
 12  UnempRate2010         3272 non-null   float64
 13  UnempRate2007         3270 non-null   float64
 14  PctEmpChange1020      3193 non-null   float64
 15  PctEmpChange0720      3188 non-null   float64
 16  PctEmpChange0710      3267 non-null   float64
 17  PctEmpAgriculture     3273 non-null   float64
 18  PctEmpMining          3273 non-null   float64
 19  PctEmpConstruction    3273 non-null   float64
 20  PctEmpManufacturing   3273 non-null   float64
 21  PctEmpTrade           3273 non-null   float64
 22  PctEmpTrans           3273 non-null   float64
 23  PctEmpInformation     3273 non-null   float64
```

```
jobs_cleaned_df.isnull().sum()
```

```
FIPS                   0
State                  0
County                 0
PctEmpAgriculture      0
PctEmpMining           0
PctEmpConstruction     0
PctEmpManufacturing    0
PctEmpTrade            0
PctEmpTrans            0
PctEmpInformation      0
PctEmpFIRE             0
PctEmpServices         0
PctEmpGovt             0
NumCivEmployed         0
dtype: int64
```

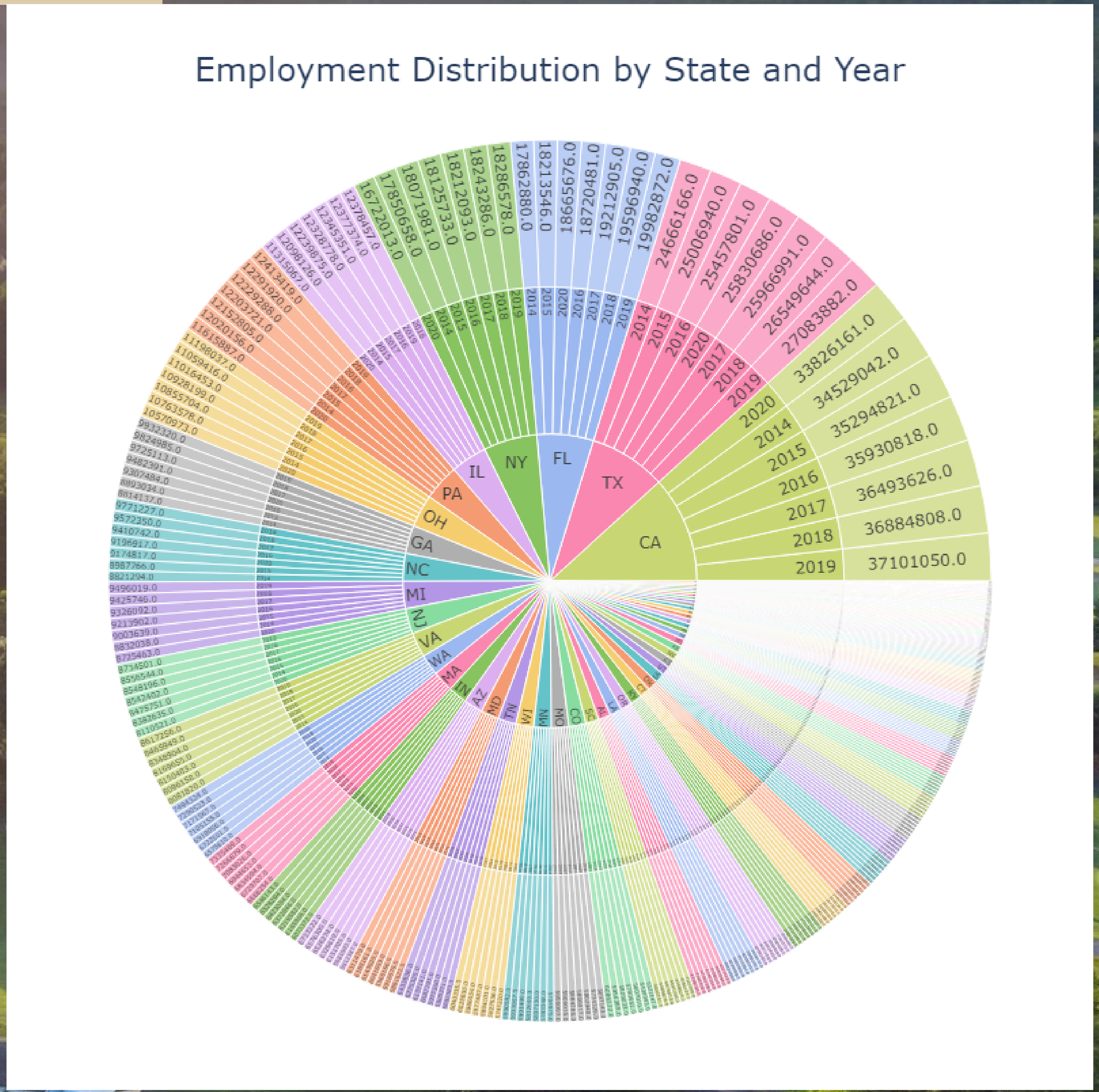
- In our analysis of the Economic Atlas of Rural and Small-Town America, we processed large datasets containing thousands of rows and multiple columns of socioeconomic data.
- Challenges
  - Large datasets
  - Missing values
  - Inconsistent data formats
- Data Cleaning
  - Dropped irrelevant columns
  - Rectified null values
  - Normalized database
  - Incorporated lat. and long. CSV into location data
  - Corrected data formats for uniformity and clarity

Sql File

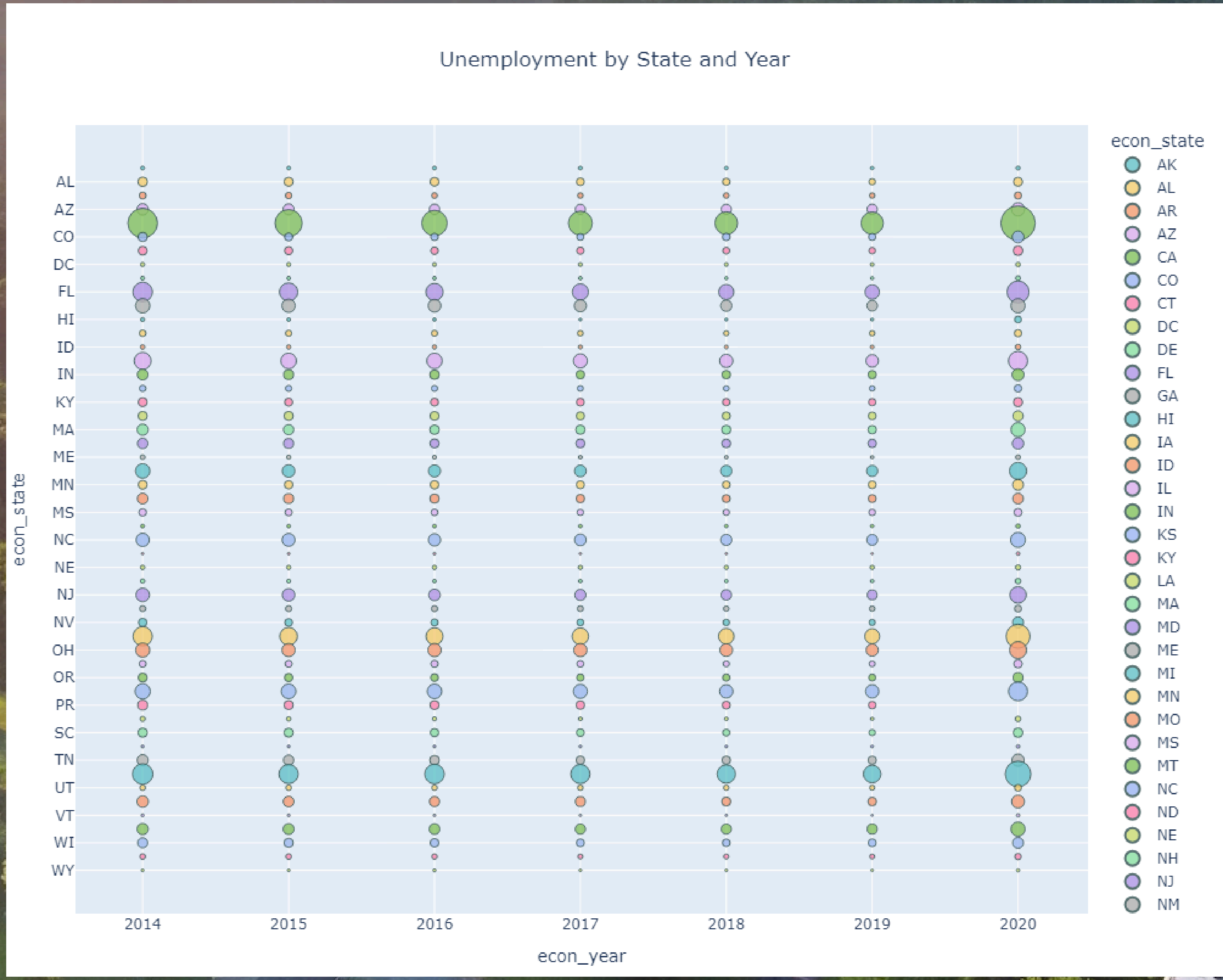
```python
        employment_df = pd.read_sql(text(query), con=self.engine)
        employment_data = employment_df.to_dict(orient="records")

        return(employment_data)

    def getAllData(self, econ_state):
        # allow the user to select ALL country
        if econ_state == "All":
            where_clause = f"econ_state <> 'US'"
        else:
            where_clause = f"econ_ = '{econ_state}'"

        query = f"""
                SELECT state.econ_state,
                        econ_year,
                        name,
                        latitude,
                        longitude,
                        tot_num_employed,
                        tot_num_unemployed,
                        tot_pctemp_agriculture,
                        tot_pctemp_mining,
                        tot_pctemp_construction,
                        tot_pctemp_manufacturing,
                        tot_pctemp_trade,
                        tot_pctemp_trans,
                        tot_pctemp_information,
                        tot_pctemp_fire,
                        tot_pctemp_services,
                        tot_pctemp_government,
                        tot_um_civ_labor_force
                FROM
                    (
                    SELECT
                        jobs.econ_state,
                        employment.econ_year,
                        sum(num_employed) as tot_num_employed,
                        sum(num_unemployed) as tot_num_unemployed,
                        sum(pctemp_agriculture) as tot_pctemp_agriculture,
                        sum(pctemp_mining)as tot_pctemp_mining,
                        sum(pctemp_construction) as tot_pctemp_construction,
                        sum(pctemp_manufacturing) as tot_pctemp_manufacturing,
                        sum(pctemp_trade) as tot_pctemp_trade,
                        sum(pctemp_trans) as tot_pctemp_trans,
                        sum(pctemp_information) as tot_pctemp_information,
                        sum(pctemp_fire) as tot_pctemp_fire,
                        sum(pctemp_services) as tot_pctemp_services,
                        sum(pctemp_government) as tot_pctemp_government,
                        sum(num_civ_labor_force) as tot_um_civ_labor_force
                    FROM
                        jobs
                    JOIN
                        employment
                    ON jobs.fips = employment.fips
                    JOIN
                        unemployment
                    ON employment.fips = unemployment.fips
                    AND employment.econ_year = unemployment.econ_year
                    WHERE
```

```python
                        latitude,
                        longitude,
                        tot_num_employed,
                        tot_num_unemployed,
                        tot_pctemp_agriculture,
                        tot_pctemp_mining,
                        tot_pctemp_construction,
                        tot_pctemp_manufacturing,
                        tot_pctemp_trade,
                        tot_pctemp_trans,
                        tot_pctemp_information,
                        tot_pctemp_fire,
                        tot_pctemp_services,
                        tot_pctemp_government,
                        tot_um_civ_labor_force
                FROM
                    (
                    SELECT
                        jobs.econ_state,
                        employment.econ_year,
                        sum(num_employed) as tot_num_employed,
                        sum(num_unemployed) as tot_num_unemployed,
                        sum(pctemp_agriculture) as tot_pctemp_agriculture,
                        sum(pctemp_mining)as tot_pctemp_mining,
                        sum(pctemp_construction) as tot_pctemp_construction,
                        sum(pctemp_manufacturing) as tot_pctemp_manufacturing,
                        sum(pctemp_trade) as tot_pctemp_trade,
                        sum(pctemp_trans) as tot_pctemp_trans,
                        sum(pctemp_information) as tot_pctemp_information,
                        sum(pctemp_fire) as tot_pctemp_fire,
                        sum(pctemp_services) as tot_pctemp_services,
                        sum(pctemp_government) as tot_pctemp_government,
                        sum(num_civ_labor_force) as tot_um_civ_labor_force
                    FROM
                        jobs
                    JOIN
                        employment
                    ON jobs.fips = employment.fips
                    JOIN
                        unemployment
                    ON employment.fips = unemployment.fips
                    AND employment.econ_year = unemployment.econ_year
                    WHERE
                        {where_clause};
                    GROUP BY
                        jobs.econ_state,
                        employment.econ_year
                    ORDER BY
                        jobs.econ_state,
                        employment.econ_year
                    ) AS JOBS
                JOIN
                    state ON JOBS.econ_state = state.econ_state
                ORDER BY
                    econ_state,
                    econ_year
        """

        alldata_df = pd.read_sql(text(query), con=self.engine)
        all_data = alldata_df.to_dict(orient="records")

        return(all_data)
```

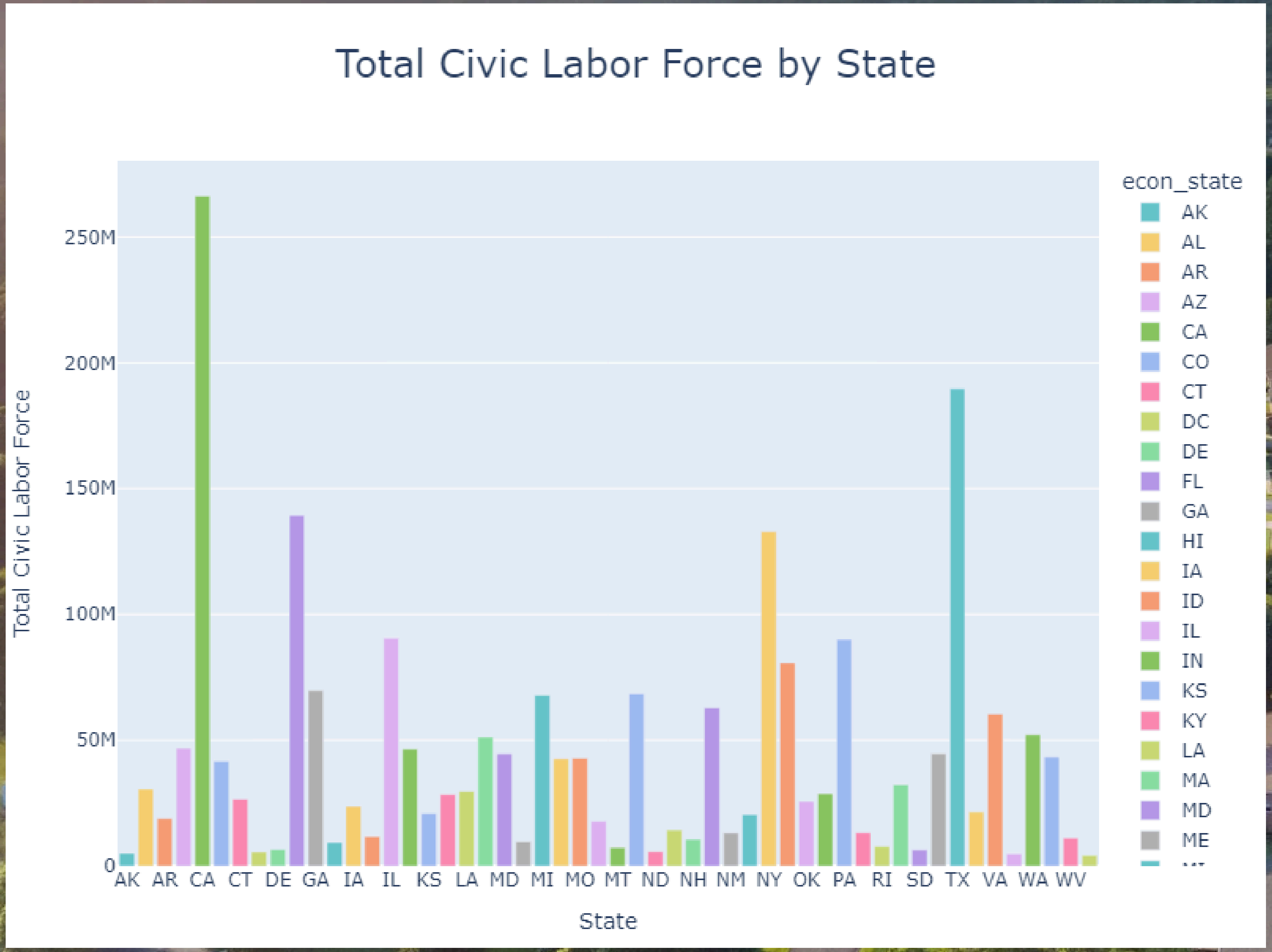
Visualizations



Visualizations



Visualizations



Analysis Findings

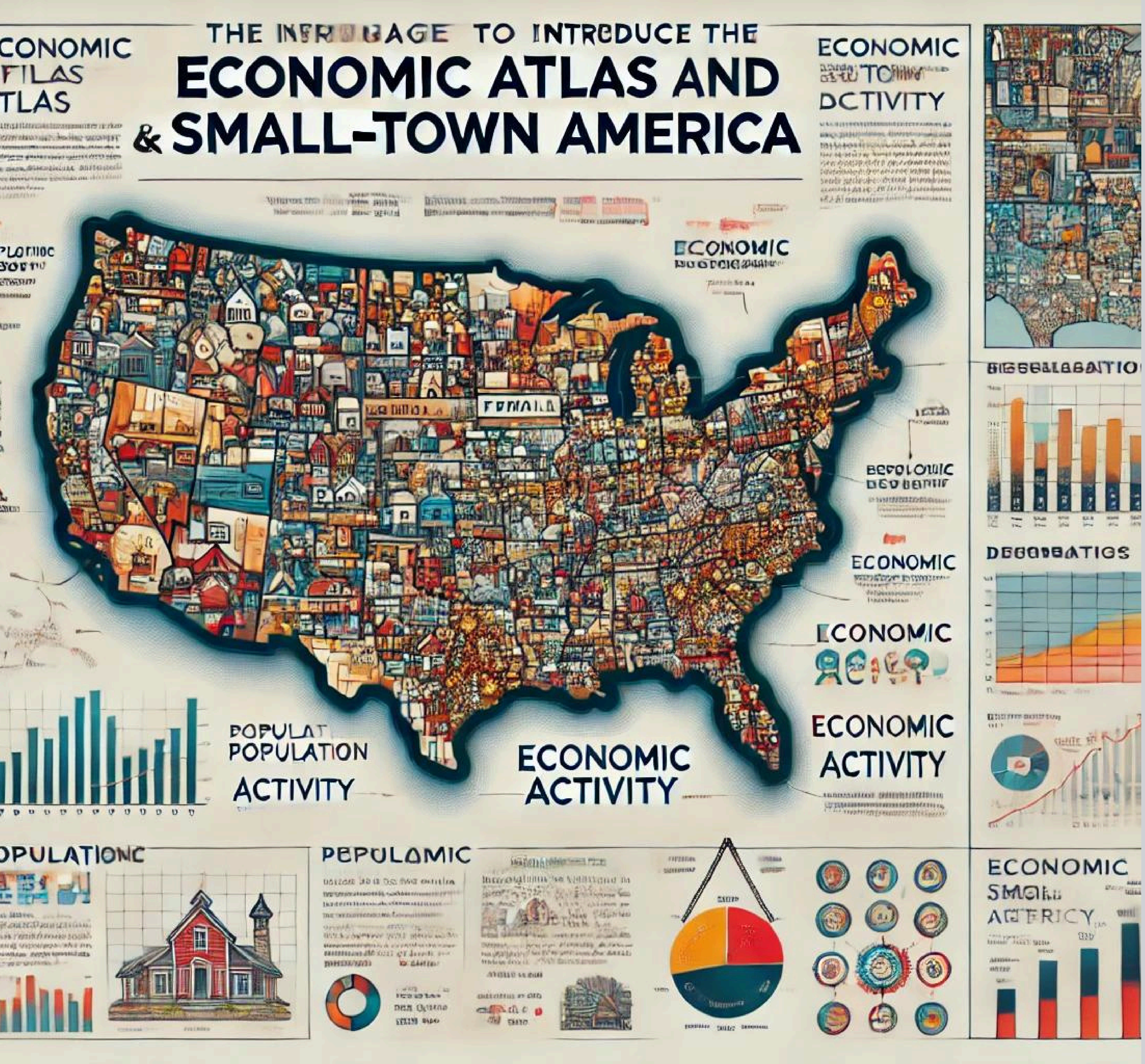
- **Employment Distribution:** The analysis reveals that rural and small-town areas have distinct employment patterns, with certain industries like agriculture and manufacturing being more prevalent compared to urban regions.
- **Income Levels:** There is a noticeable disparity in income levels across different rural regions, with some areas significantly lagging behind national averages, highlighting the economic challenges faced by these communities.
- **Unemployment Trends:** Unemployment rates in rural and small-town America show a varied trend, with some regions experiencing persistently high unemployment rates, suggesting structural economic issues.
- **Economic Dependence:** Many rural counties are economically dependent on specific industries, making them vulnerable to sector-specific downturns. This reliance can lead to economic instability if these industries decline.

Limitations/Bias

- The data itself is federal census information
  - Method of information collection is inefficient
  - Doesn't actually account for total amount of work being done or revenue being generated (especially in TX and FL with the construction industry)

Links

- Github
- Kaggle
- Xpert Learning Assistant
- https://github.com/cisnerosjp/project3Team2/tree/main
- https://www.texastribune.org/2023/11/21/texas-immigrants-pew-research/#:~:text=Unauthorized%20immigrants%20make%20up%208,networks%20that%20encourage%20further%20immigration
- https://www.usatoday.com/story/news/politics/2023/06/21/florida-immigration-law-business-owners-fear-exodus-of-workers-construction-landscaping/70341632007/


THE INFRUGAGE TO INTRODUCE THE
ECONOMIC ATLAS AND
& SMALL-TOWN AMERICA
ECONOMIC
DCTIVITY
ECONOMIC
ECONOMIC
ECONOMIC
ECONOMIC
ACTIVITY
POPULAT
POPULATION
ACTIVITY
ECONOMIC
ACTIVITY
PEPULAMIC
ECONOMIC

Thank you!!!!!