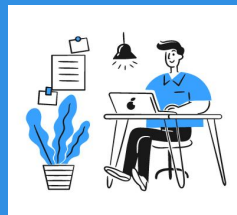
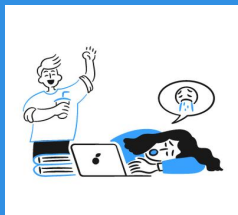
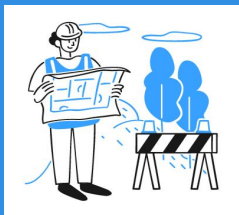


Economic Trends in Minnesota: A County-Level Analysis of Income and Unemployment (2019–2023)

Group 2: Ally, Derek, Brynn, Jackson, Erica



Objective

- Analyze county-level income and unemployment data in Minnesota
- Identify statistical outliers and patterns
- Present clear, interactive visualizations to tell the data story



Methods - Data Source

- County-level unemployment and income data sourced from **NIMHD's HDPulse** tool
- CSV files were imported into a **PostgreSQL database** for structured storage
- Data was **cleaned, merged, and analyzed** using **Python** (Pandas, NumPy)



Methods - Tools

- Python libraries used: **Pandas**, **NumPy**, **Seaborn**, **Matplotlib**, **SciPy**
- **ipywidgets** for interactive sliders and **Streamlit** for an interactive heatmap web app
- **Jupyter Notebooks** used for all preprocessing, analysis, and visualization tasks

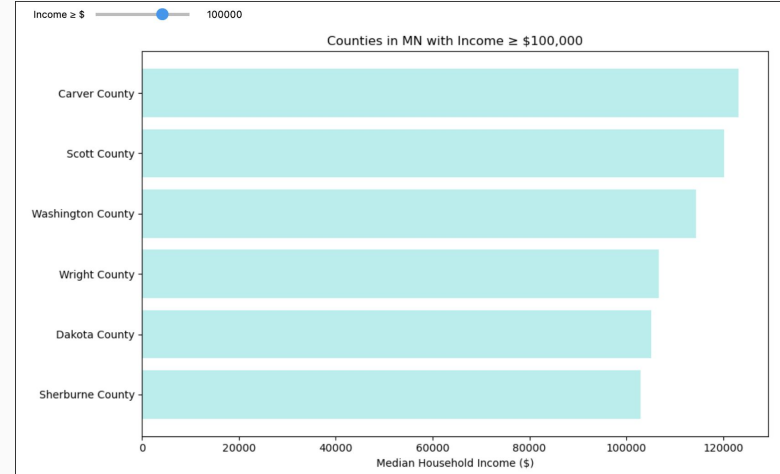
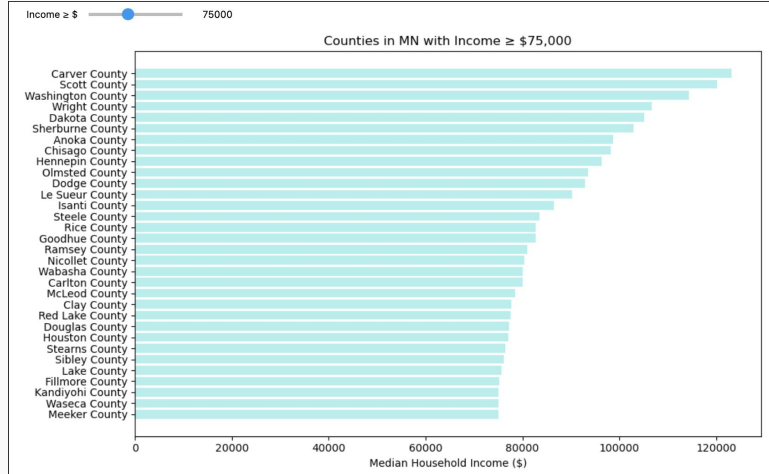


Visualizations



Visualizations -Bar Chart

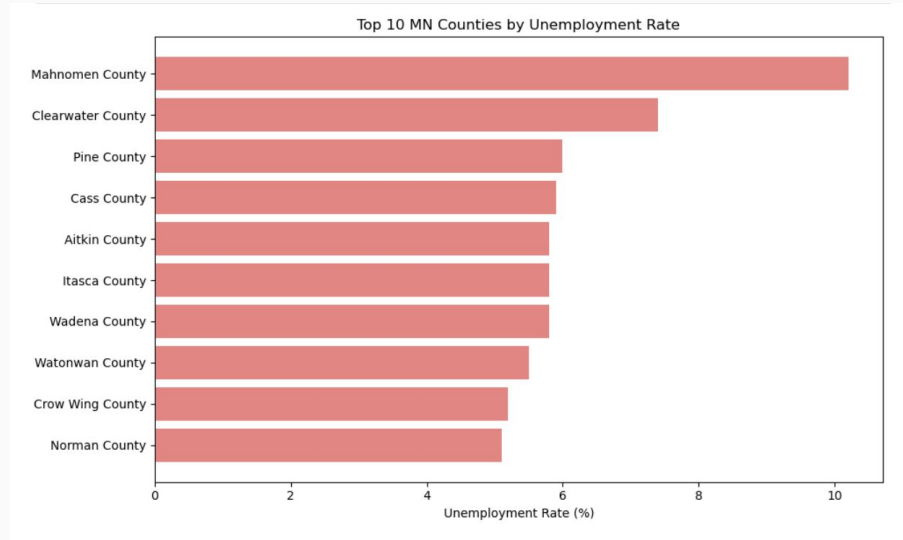
Top counties by **income** - User can filter by income level



Visualizations - Bar Chart Cont'd

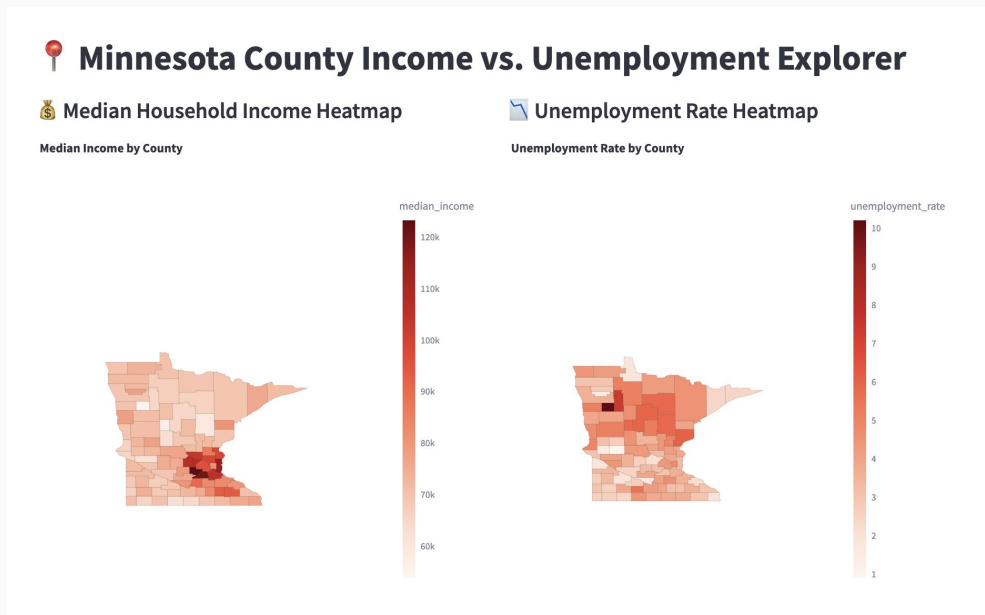
Top Counties by **Unemployment**

1. Mahomen
2. Clearwater
3. Pine
4. Cass
5. Aitkin

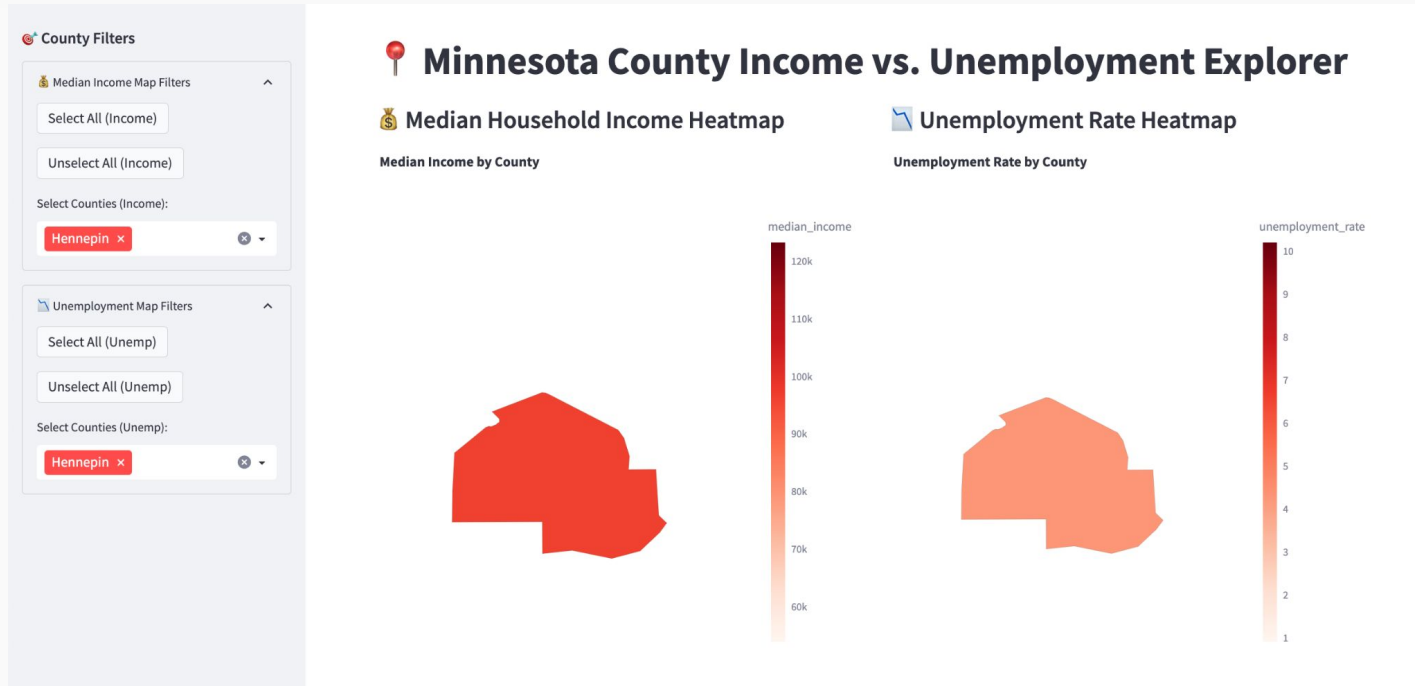


Visualizations - Heatmap

- **Streamlit,**
- **Plotly**
- **GeoPandas**



Visualizations - Heatmap Cont'd



Visualizations - Heatmap Cont'd

County Filters

Median Income Map Filters

Select All (Income)

Unselect All (Income)

Select Counties (Income):

Carver x Scott x
Washington x Wright x
Dakota x Sherburne x
Hennepin x

Unemployment Map Filters

Select All (Unemp)

Unselect All (Unemp)

Select Counties (Unemp):

Carver x Scott x
Washington x Wright x
Dakota x Sherburne x
Hennepin x

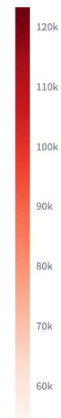
Minnesota County Income vs. Unemployment Explorer

Median Household Income Heatmap

Median Income by County

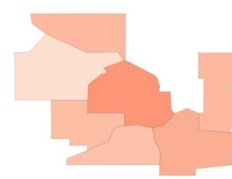


median_income

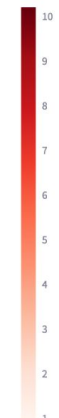


Unemployment Rate Heatmap

Unemployment Rate by County



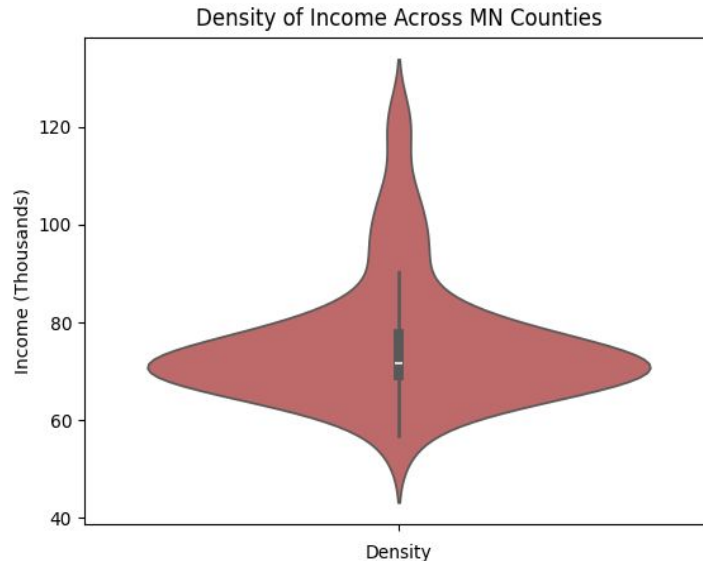
unemployment_rate



Visualizations - Violin Chart

Income Density

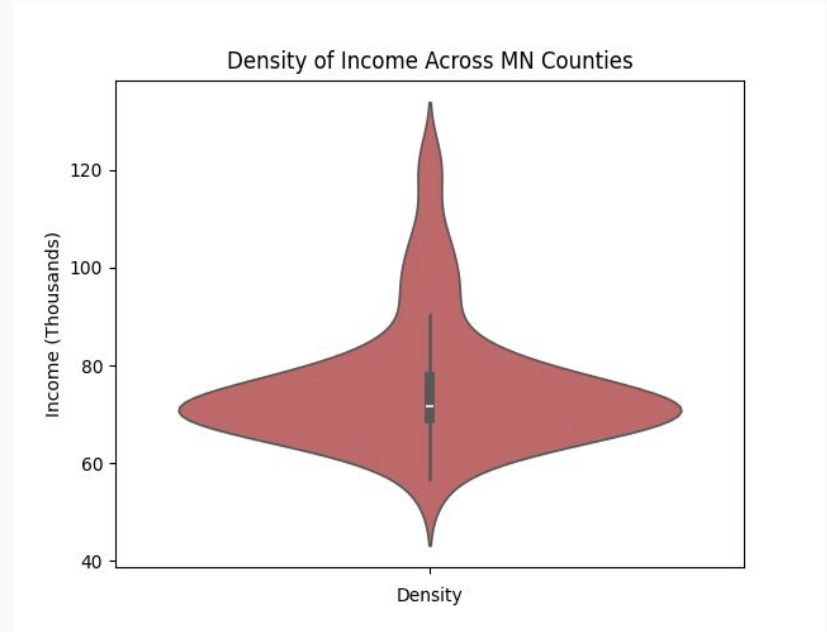
- Most counties make **between ~\$69K and ~\$77.5K**
The **median is ~\$71.6K**
- a few counties are **pulling way higher**, creating **a long right tail** (income inequality).
- **Upper outliers** = counties making **over \$90,304.25**
- **Lower outliers** = counties making **under \$56,378.25**



Visualizations - Violin Chart Cont'd

Income Density

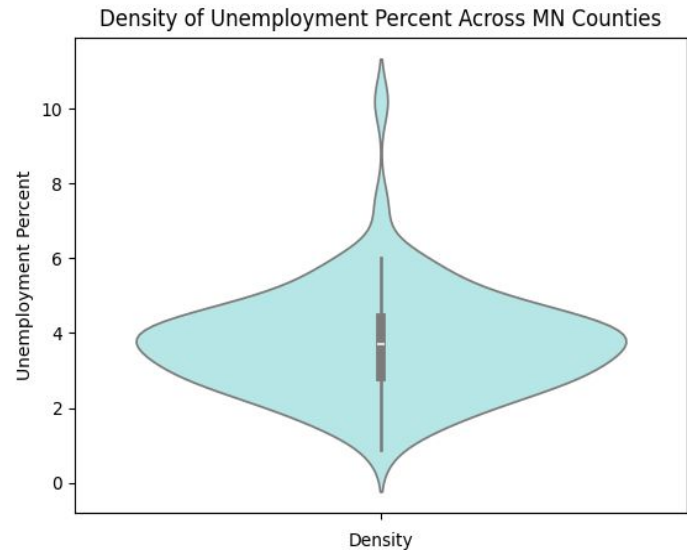
County	Income	Unemployment %
Carver	\$123,144	3.1%
Scott	\$120,247	3.0%
Anoka	\$114,457	3.9%
Washington	\$106,666	3.3%
Wright	\$105,211	2.1%
Dakota	\$102,965	3.6%
Sherburne	\$98,760	3.3%
Chisago	\$98,260	3.9%



Visualizations - Violin Chart Cont'd

Unemployment Density

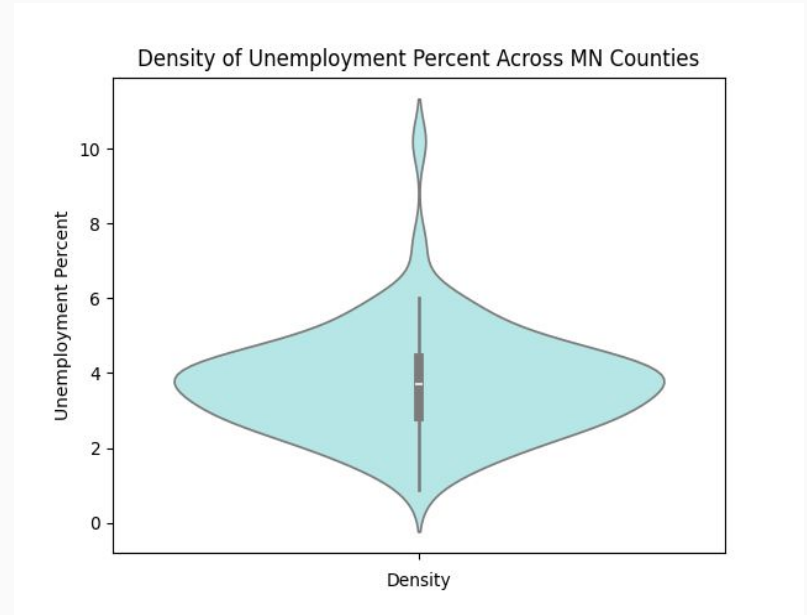
- **Lower Fence:** ~0.53% Anyone below this is an *unusually low* unemployment rate (**none**)
- **Upper Fence:** ~6.73% Anyone above this has an *unusually high* unemployment rate
- **(Note the income Lower outliers = counties making under \$56,378.25, where Mahnomon Co. is even worse affected economically)**



Visualizations - Violin Chart Cont'd

Unemployment Density

County	Unemployed (%)	Rank (Unemployed)	Income
Mahnomen	10.2%	3054	53,925
Clearwater	7.4%	2824	64,934

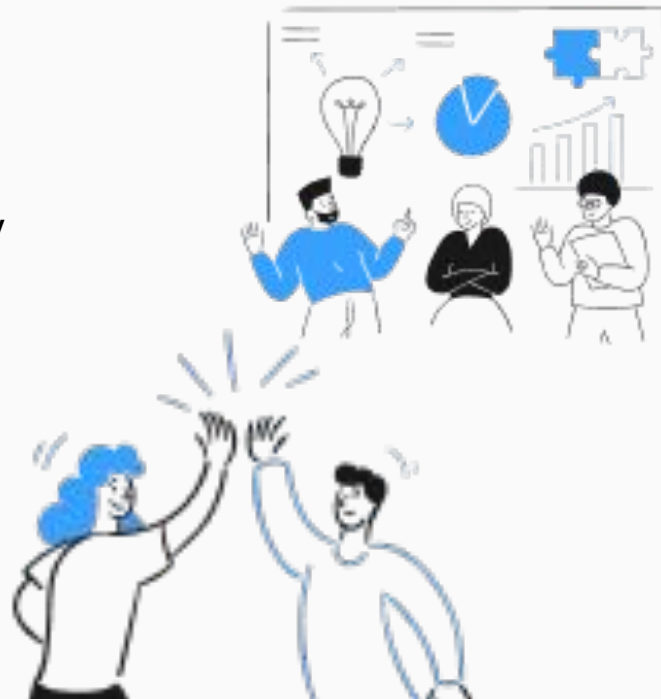


Summary & Conclusions



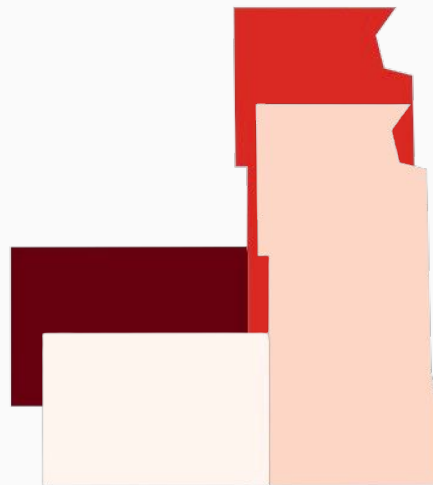
Summary & Conclusions

- Analyzed 5 years of county-level income and unemployment data in Minnesota
- Used IQR to detect statistical outliers and identify economically vulnerable areas
- Built interactive visualizations using [ipywidgets](#), [Streamlit](#), and [GeoPandas](#)



Summary & Conclusions Cont'd

- Found *no inverse outliers* — wealthier counties had low unemployment; poorer counties had high unemployment
- Highlighted dual-burden counties like **Mahnomen** and **Clearwater** for policy attention



Thank You

