AMERICAN HOUSING PRICE ANALYSIS

Data Analysis and Visualization by:

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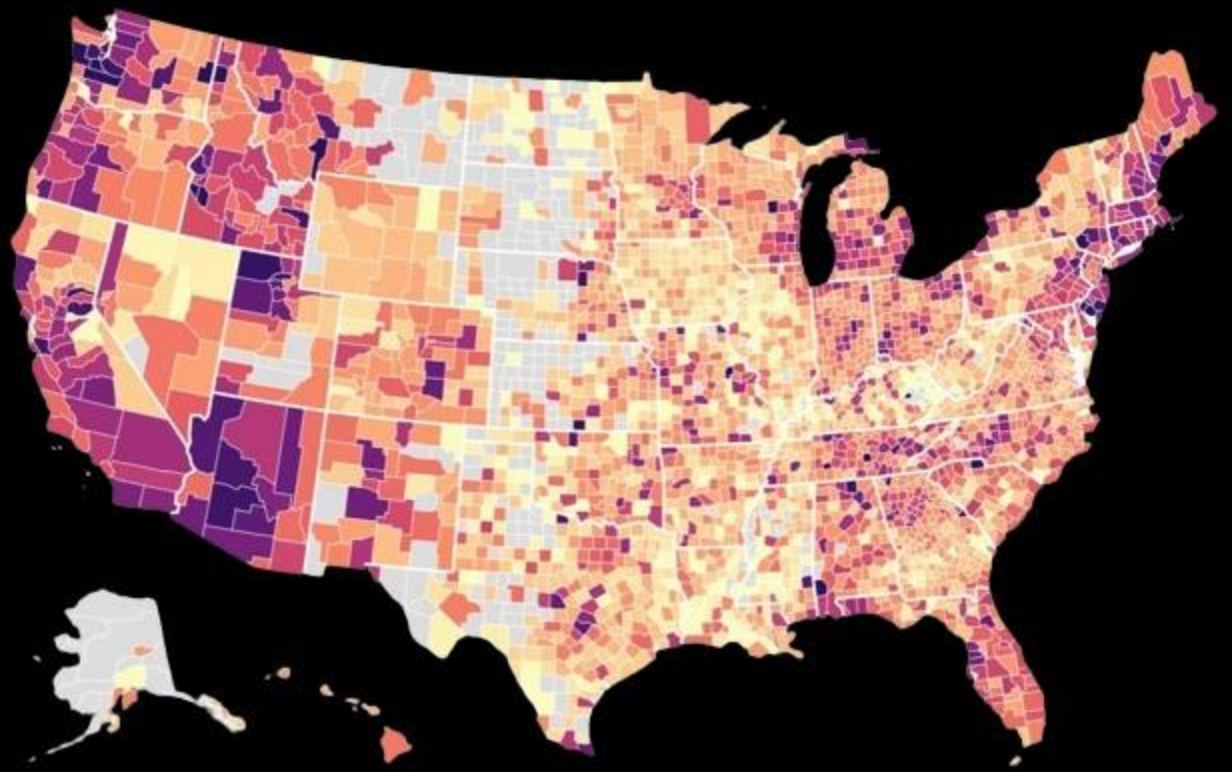
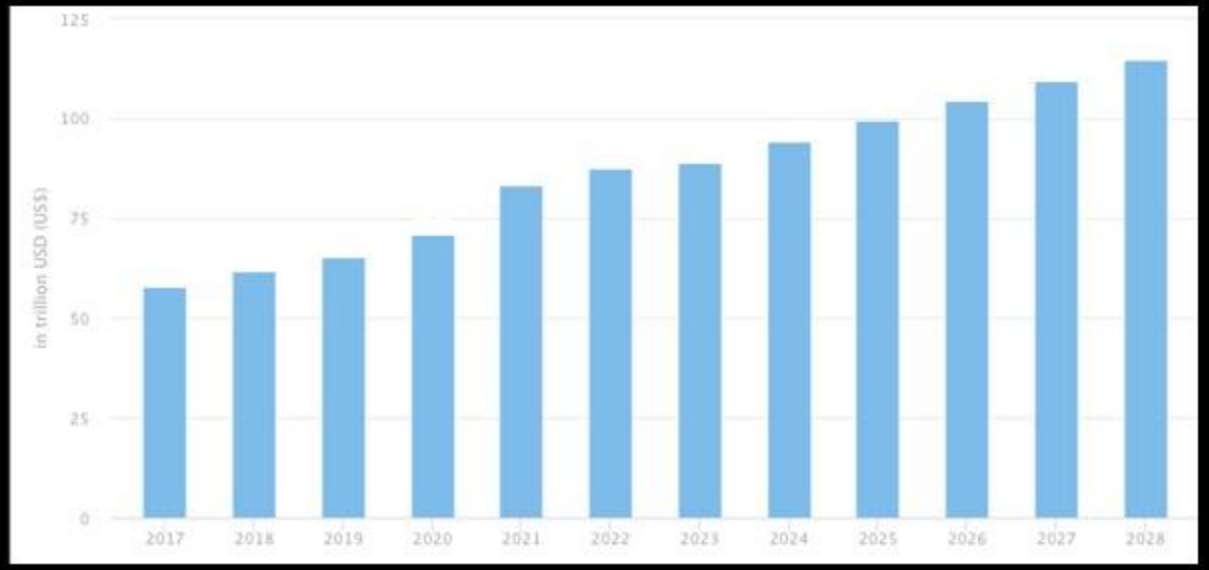
USA HOUSING PRICES

$94.39 Trillion

The Residential Real Estate market in the United States is expected to reach a value of US$94.39tn by the year 2024.





US market experiencing high demand driven by low interest rates and strong economy.

A steady annual growth rate (CAGR 2024-2028) of 4.99%, reaching US$114.70tn by 2028.

ABSTRACT

Our analysis delves into housing and demographic data from the top 50 US cities. Leveraging Python libraries like Matplotlib, Seaborn, and Pandas for EDA, we uncover trends and correlations. We compare housing characteristics across cities and zip codes, shedding light on regional disparities and urban dynamics. This exploration aids stakeholders—real estate investors, urban planners, and policymakers—in informed decision-making for urban development and housing strategies.

INTRODUCTION TO THE DATASET

The dataset covers information on housing and demographic factors in the top 50 American cities by population.

It includes variables such as price, beds, baths, living space, address, city, state, zip code population, zip code density, county, and median household income.

This dataset offers a rich source of insights into understanding city life and housing markets.

Analyzing this data is essential for stakeholders such as real estate investors, urban planners, and policymakers to make smart choices and strategies.

By delving into this dataset, we aim to understand trends, patterns, and correlations that shed light on the connection between housing characteristics and people living there.

Relationship Between Beds and Price

- Properties with more beds tend to have higher prices.
- Higher concentration for beds 0 – 10.
- Higher number of beds does not necessarily mean high price.

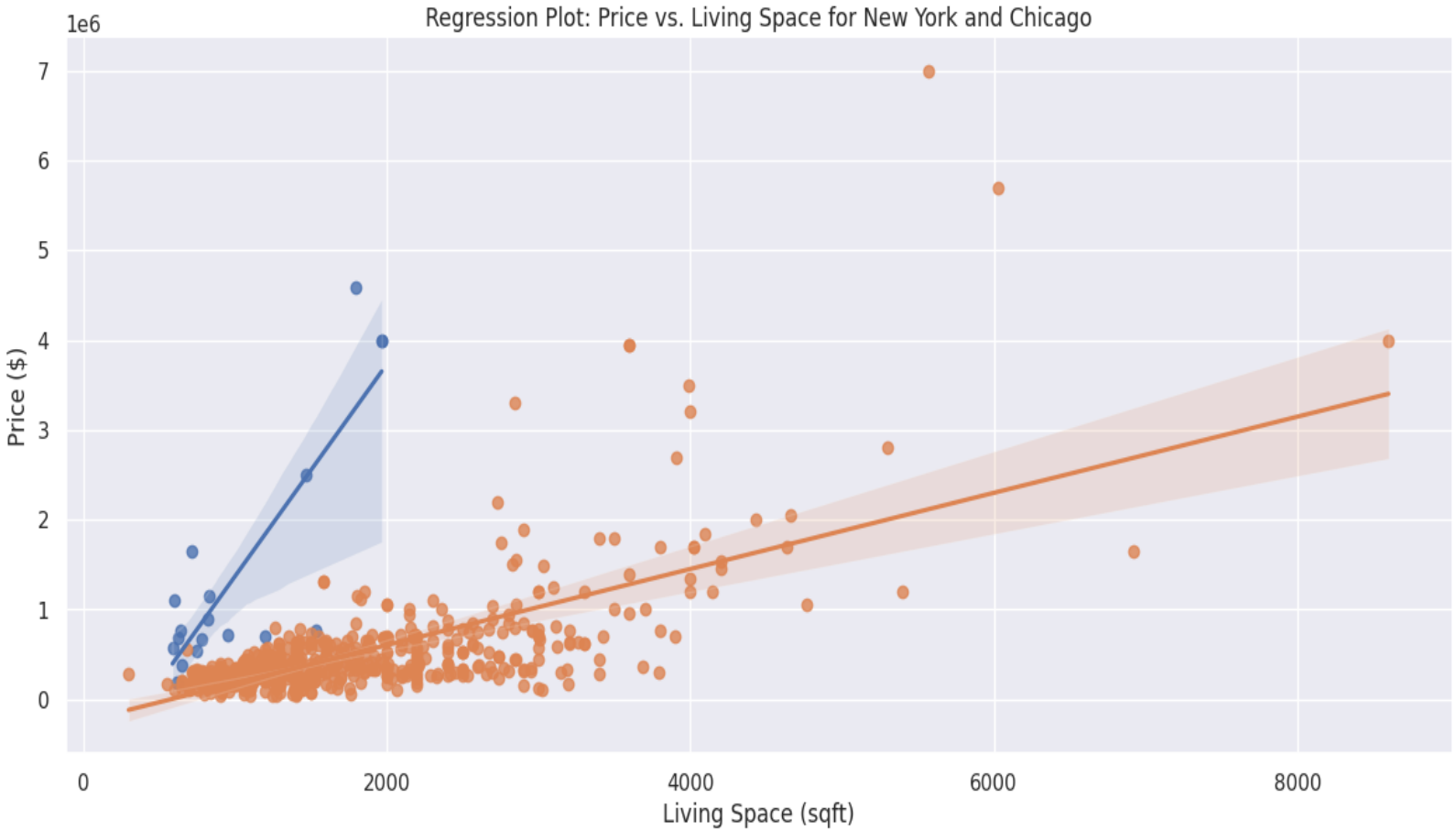
This scatter plot visualizes the relationship between the number of beds and the price of a property, using data from a given dataset. The **x-axis** represents the number of **beds**, while the **y-axis** represents the **price** in millions of dollars.

Relationship Between Living Space and Price

- The majority of data points are concentrated in the lower left region of the plot.
- Most properties have smaller living spaces (around 10,000 sq ft.) and lower prices (below $1.5 million).
- Above 40,000 sq ft. & prices above $2.5M, represents luxury properties.
- While living space appears to be a significant factor influencing price, there could be other factors at play as well, such as **location**, **amenities**, and **property** type

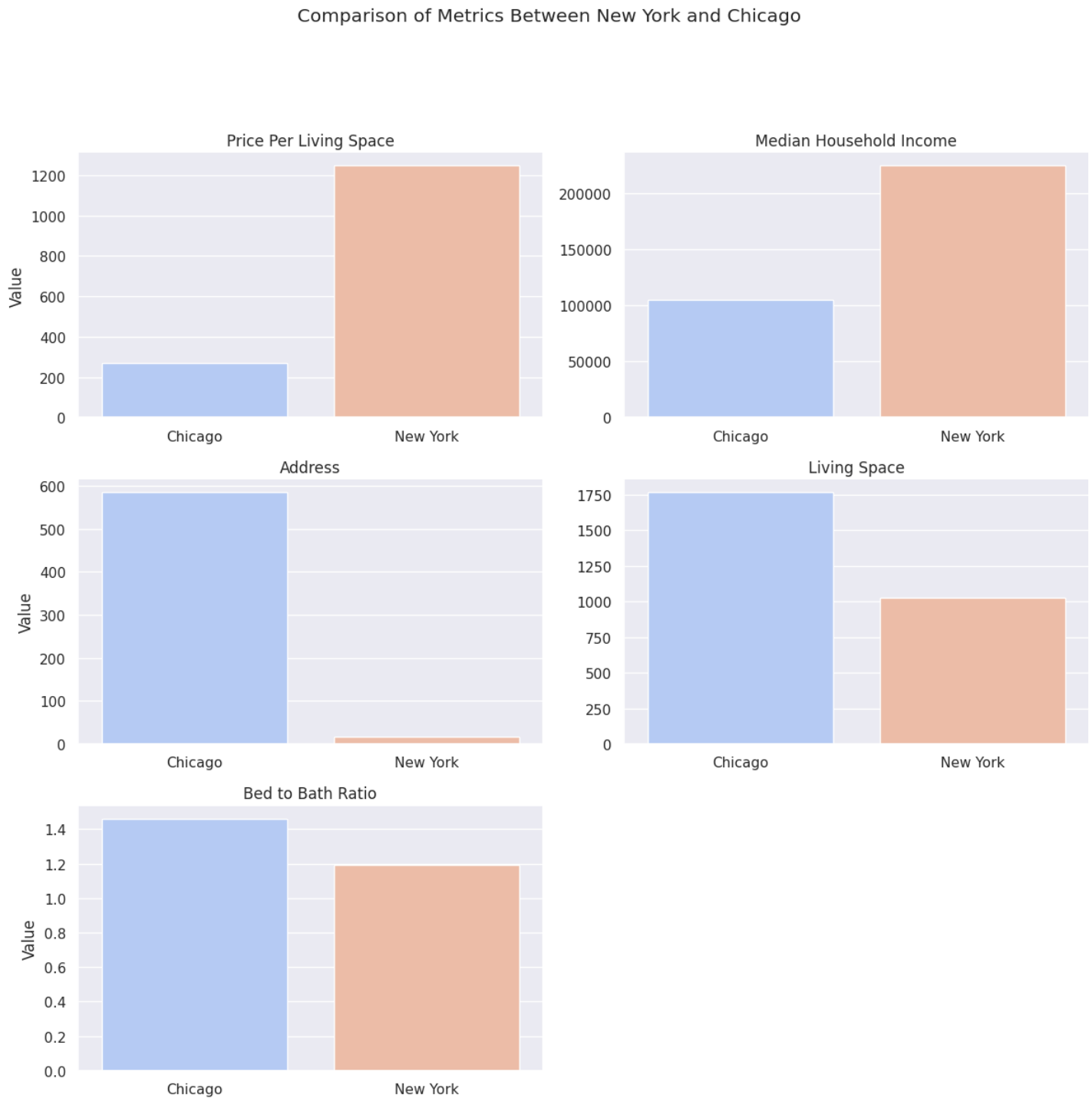
Overall, this scatter plot provides a visual representation of the positive correlation between living space and price, while also highlighting the variability and potential influence of other factors on the pricing of properties.

Let's Compare New York & Chicago



- Positive correlation between living space and price
- Chicago : Smaller living spaces and lower prices compared to New York
- New York: Have a wider spread, with some properties having significantly larger living spaces and higher prices.
- New York: has a steeper slope, indicating that the price increase per unit increase in living space.

The scatter plot shows the relationship between living space (in square feet) and price (in millions of dollars) for properties in New York and Chicago.



Comparing New York & Chicago

- Price Per Living Space: New York has a significantly higher price per living space compared to Chicago, indicating more expensive housing costs for a given living area.

- Median Household Income: New York has a higher median household income compared to Chicago, suggesting higher earning potential but also potentially higher living costs.

- Address (Bed to Bath Ratio): Chicago has a higher bed to bath ratio compared to New York, which could indicate larger housing units or a different housing market dynamic.

- Living Space: Chicago is higher compared to New York. Chicago properties tend to have larger living spaces.

What can we conclude from this one particular example?

- **Living space** is a significant factor **influencing property prices** in both cities, but the relationship is stronger in New York, where prices tend to increase more rapidly with an increase in living space.

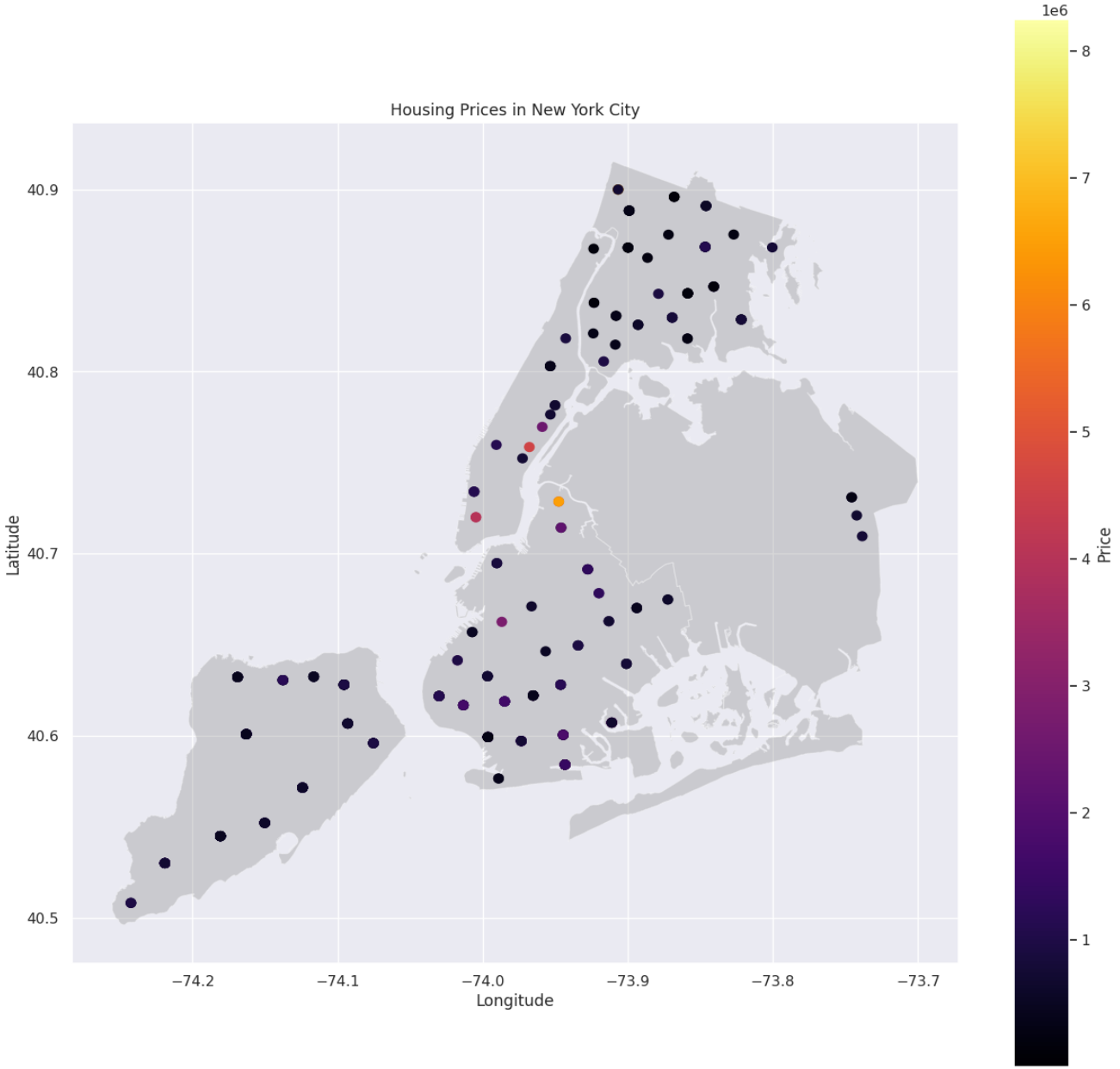
- **New York** has higher housing costs per living space and higher median household incomes, suggesting a **more expensive housing market** overall.

- **Chicago**, on the other hand, tends to have **larger living spaces**, **lower prices** per living space, and a **higher bed to bath ratio**, indicating potentially more **affordable** and **spacious** housing options.

- The outliers in the regression plot, particularly in **New York**, hint at the presence of **luxury properties** that **drive up prices for larger living spaces**.

Conclusion : With **New York** being a more **expensive** market with **smaller living** spaces, while **Chicago** offers more **affordable** and **spacious** housing options on average.

HOUSING PRICES IN NEW YORK!



High-priced areas: The **darkest purple** and **red dots** clustered towards the **center** represent the neighborhoods with the highest housing prices. These are likely areas like Manhattan, where real estate prices are traditionally among the most expensive in the city.

Lower-priced areas: The lighter purple and blue dots towards the **outer edges** with relatively **lower** housing prices **compared to the central regions**. These could be neighborhoods in the boroughs of **Brooklyn**, **Queens**, the **Bronx**, or **Staten Island**, which generally have more affordable housing options.

Geographic patterns: A distinct pattern, with housing prices **decreasing** as you **move away** from the **central** core of the city towards the outer boroughs and neighborhoods. This pattern is consistent with the typical real estate trends in major cities, where central areas command **higher prices** due to factors like **proximity**, **accessibility**, and **demand**.

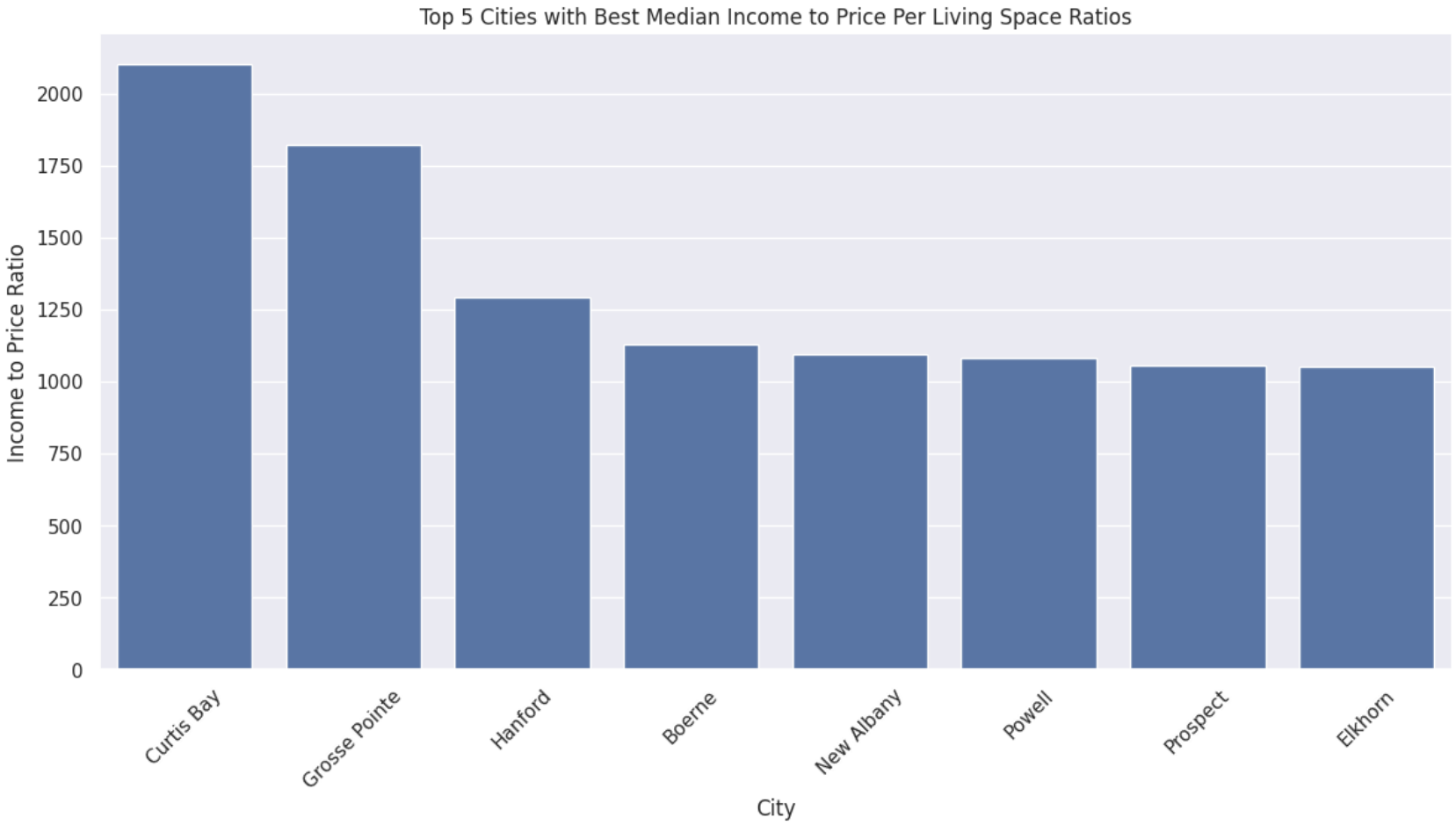
WHAT OBSERVATIONS DID WE FIND IN THE DATASET?

Throughout our discussion, we analyzed several visualizations and data sets related to housing markets, with example of the cities like New York and Chicago.

We started by examining scatter plots that showed the relationship between living space and price, as well as the relationship between the number of beds and price.

- Properties with **larger living spaces** and **more bedrooms** tend to have **higher prices**.
- We then looked at a bar chart displaying the top cities with the best median income to price per living space ratios, which provided insights into housing affordability across different locations.
- Despite **higher median** household incomes in **New York**, the **high housing costs** likely make it **less affordable** compared to Chicago for the average household.
- Crucial factor influencing property prices, other factors such as location, amenities, and property type could also play a significant role in the pricing dynamics of these cities.

Median Income to Price Per Living Space Ratio



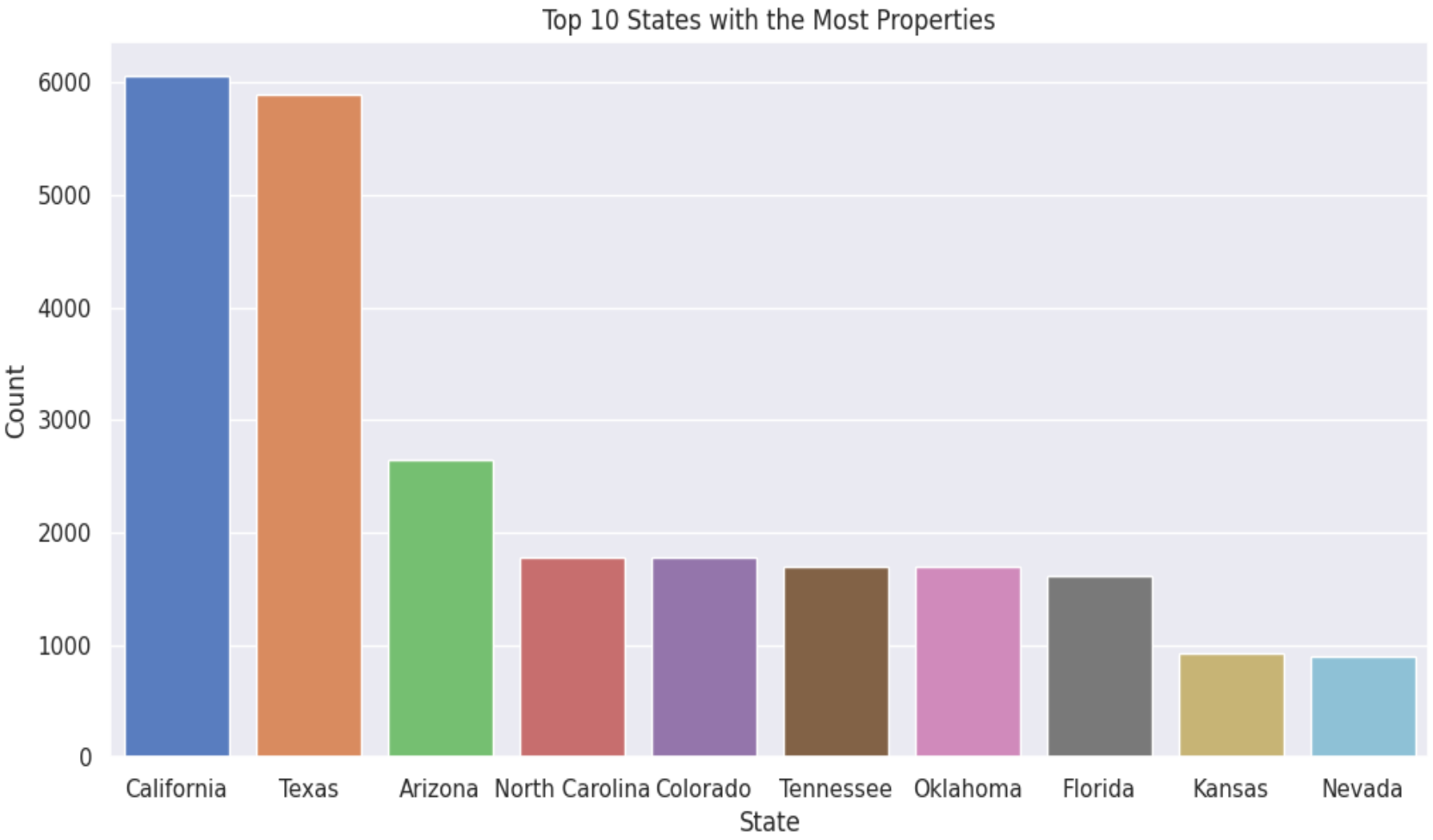
This bar graph shows the top 5 cities with the best median income to price per living space ratios. The y-axis represents the income to price ratio, while the x-axis displays the city names.

- **Highest income** to price ratio is **Curtis Bay**, followed by **Grosse Pointe** and **Hartford** have higher median incomes relative to the cost-of-living space or housing prices, more affordable for residents.

- This **metric** can provide insights into the overall **cost of living** and **economic conditions** in different cities.

- Other factors that may influence the overall livability or desirability of a city, such as **amenities**, **job opportunities**, transportation, and **quality of life.**

Top 10 States with Most Properties



This bar graph shows the top 10 States Most Properties. The y-axis represents count, while the x-axis displays the State names.

- • California: With a count of around 5,800, due to its large population, economic importance, and attractive real estate markets like Los Angeles, San Francisco, and San Diego.
- • Nevada: With approximately 500 properties, potentially driven by the tourism and entertainment industries centered around Las Vegas.
- •Concentration of properties is shaped by demographic, economic, geographic, and lifestyle factors unique to each state.

How does the learning from this Dataset help in Real Life decisions

For urban planners and policymakers:

- Understanding the **relationship** between housing **costs**, **incomes**, and **property** attributes can guide policies aimed at **promoting affordable housing** and **equitable** development.

- Insights on **geographic patterns** of housing prices within cities can inform zoning **regulations**, infrastructure **investments**, and neighborhood revitalization efforts.

For real estate investors and financial institutions:

- Insights on **pricing trends**, correlations with property attributes, and **market dynamics** can guide **investment decisions** and identify potential areas for **profitable real estate ventures**.

- Understanding the relative affordability and pricing patterns in different markets can inform **mortgage lending** practices, **risk assessments**, and **portfolio diversification strategies**.

- Knowledge of **geographic** patterns within cities can help investors identify **up-and-coming neighborhoods** for **strategic property acquisitions** or **developments**.

Continuing..

For Individuals and Households:

- Understanding housing costs relative to incomes in different cities can **guide** decisions on where to **live** based on **affordability** considerations.

- Insights on the relationship between **property attributes** (living space, bedrooms, etc.) and **prices** can help buyers/renters make informed trade-offs based on their budgets and needs.

For Businesses and Employers:

- Knowledge of housing costs in different cities can influence **decisions** on where to locate **offices/operations** based on the ability to attract and retain talent considering housing affordability for employees.

- Real estate **developers** and **construction** firms can use insights on pricing dynamics to identify opportunities for developing **specific types of housing** (luxury, affordable, etc.) in different markets.

- Businesses catering to **housing needs** (furniture, home services, etc.) can strategize their offerings and target markets based on housing market dynamics.

Thank you

Overall, the comprehensive analysis we conducted, leveraging visualizations and data, provides valuable information that can empower various stakeholders to make more informed decisions regarding housing affordability, urban development strategies, investment opportunities, and policy interventions tailored to the unique dynamics of different housing markets.

References

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The GitHub Repo

link