

Cost of Homes, Mortgage Rates, and Avg Household Income in the US

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01

DESCRIPTION



Description

The aim of this project is to uncover patterns between the cost of homes in the US, their interest rates, and the average family income within the past 50 years.



02

QUESTIONS & HYPOTHESES



QUESTIONS & HYPOTHESES

**What is the relationship
between the cost of
homes and the interest
rates in the US?**

As the interest rates decrease, the
cost of a home increases.

**What is the relationship
between the average
family income and the
cost of homes?**

As the average household income
increases, the cost of homes
increases.



03

DATASETS + DATA CLEANING



FRED Economic Data

"Welcome to FRED, your trusted source for economic data since 1991. Download, graph, and track **823,000 US and international time series** from **114 sources**."

Average Sales Price of Houses Sold for the US

- Quarterly data
- <https://fred.stlouisfed.org/series/ASPUS>

30-Year Fixed Rate Mortgage Average in the US

- Quarterly data
- <https://fred.stlouisfed.org/series/MORTGAGE30US>

Mean Family Income in the United States

- Annual data
- <https://fred.stlouisfed.org/series/MAFAINUSA646N>

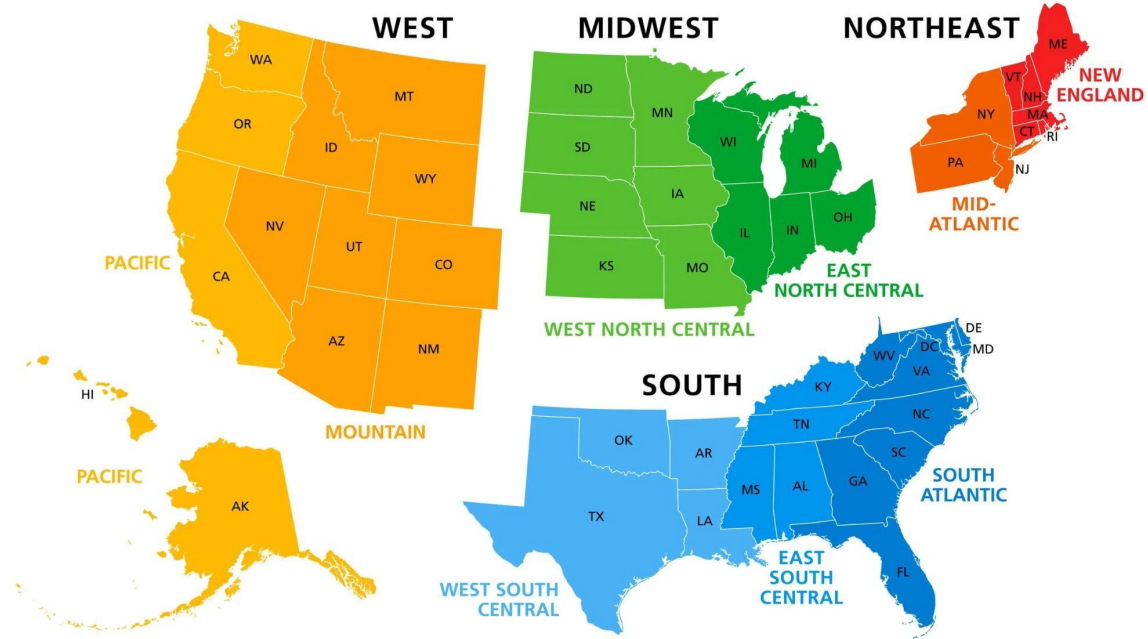


Additional information

- House Price and Interest Rate data came in quarters so we chose the quarter 2 values to represent each year referenced
- Interest Rates are set on a Federal level whereas house prices and family income were set on regional levels
- Looked at US as a whole
- Regions: Northeast, Midwest, West, South



UNITED STATES CENSUS REGIONS AND DIVISIONS



Data Cleaning

- Mainly used jupyter notebook to clean the original CSV files from FRED
- Used PostGres SQL when it came to getting actual year values to create visualizations
- Used QuickDBD to create the ERD (Entity-relationship Diagram)



04

VISUALIZATION ANALYSIS

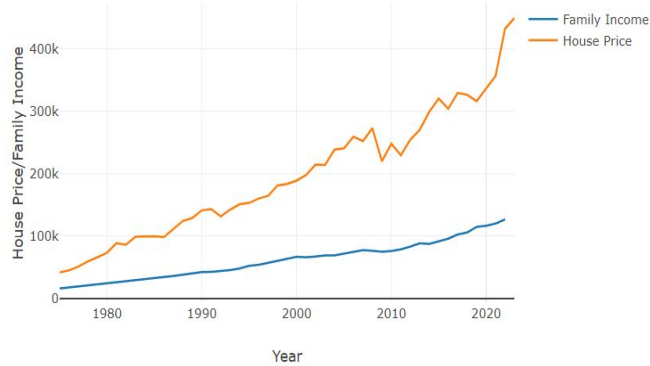


Midwest and South

Select Region:

Midwest

Changes of House Price and Family Income annually (1975 - 2022)

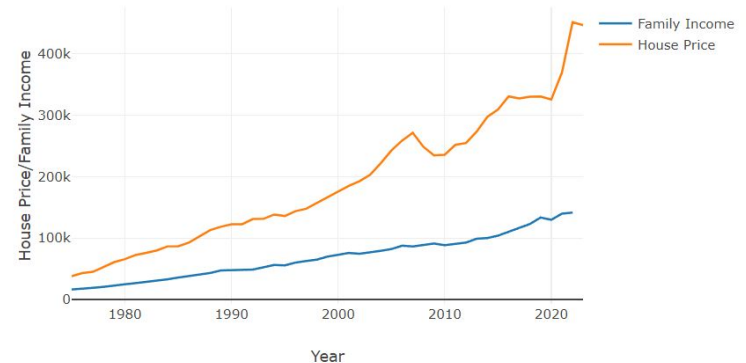


Observations: Both regions experienced a steady increase in income and housing prices respectively.

Select Region:

South

Changes of House Price and Family Income annually (1975 - 2022)

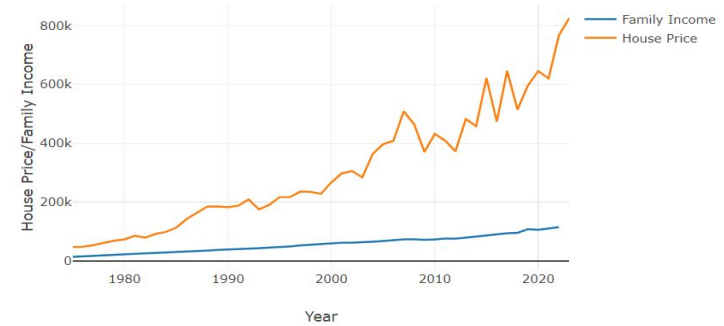


Northeast and West

Select Region:

Northeast

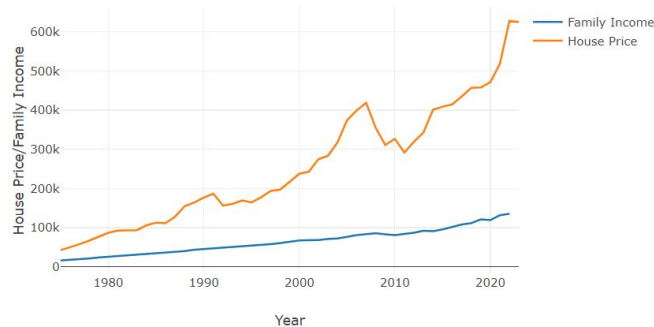
Changes of House Price and Family Income annually (1975 - 2022)



Select Region:

West

Changes of House Price and Family Income annually (1975 - 2022)



Observations: Consistent rate of change in average income. Both housing prices trend to unobtainable averages.

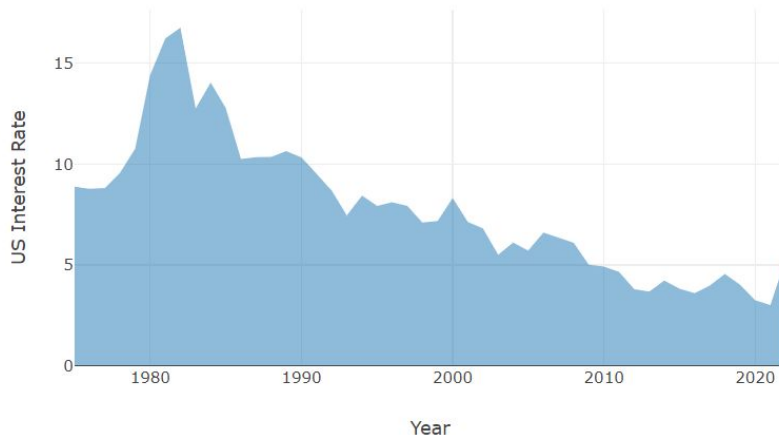


US Data

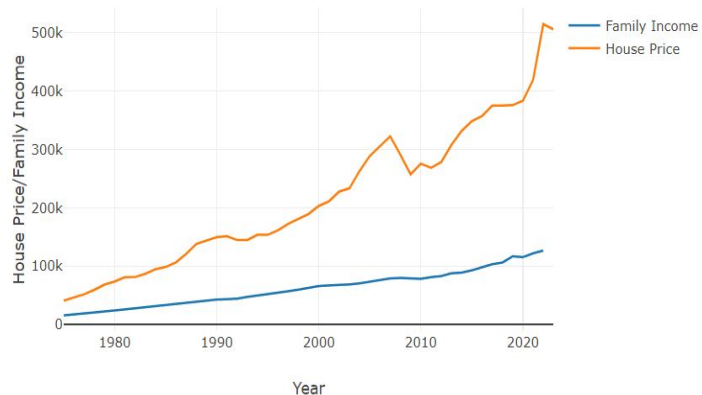
Select Region:

United States ▼

United State Interest Rate annually (1975 - 2022)



Changes of House Price and Family Income annually (1975 - 2022)



Observations: The average house price underwent significant changes while interest rates and average yearly income have had less of a rate of change. Lower interest rates generally make borrowing cheaper, leading to increased demand for homes and higher prices.

05

LIMITATIONS



LIMITATIONS

- Unable to calculate accurate annual data for house prices and interest rates so we
- Took quarter 2 values to represent the referenced years
- Unable to add a line graph to visually compare US house prices, interest rates, and family income
- Jupyter Notebook Cleaning:
 - Original data was in Dates (01/01/1975) but we
 - Converted Dates to show YearQuarter (1975Q1) which lead to sql issues and visualization issues
- PostGresQL ERD/FKs and PKs
 - Cleaned year_quarter values to remove “Q1” and “Q2” which skewed the ERD and FK constraints
 - ERD appears correct despite being unable to adjust them in PostGres due to the actual values being changes
- Did not have enough time to use incorporate new js library
- Originally had a third question we wanted to use a pie chart for but didn't have enough time/create visualization

06

Webpage



Interest Rate, Household Income, and House Price Relationship

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Use the interactive charts below to explore (1975 - 2022). Please note that the interest rates are set federally and do not change by region.

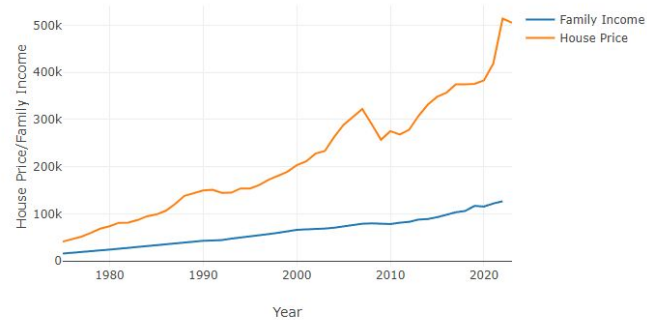
UNITED STATES CENSUS REGIONS AND DIVISIONS



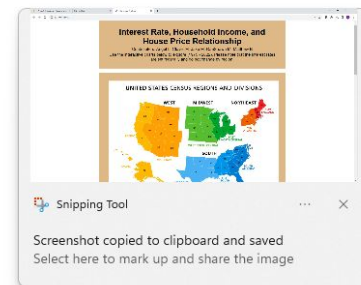
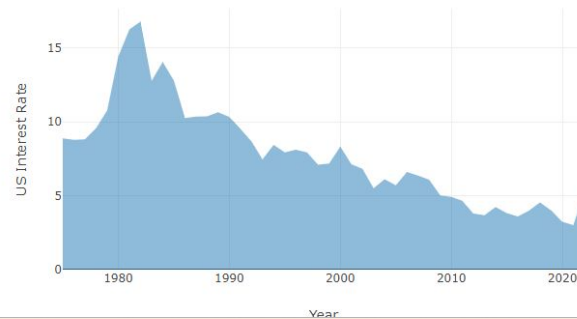
Select Region:

United States ▼

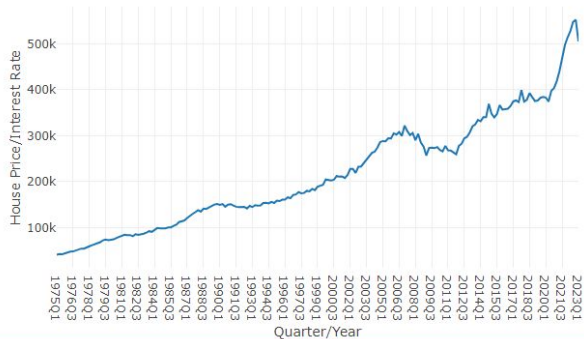
Changes of House Price and Family Income annually (1975 - 2022)



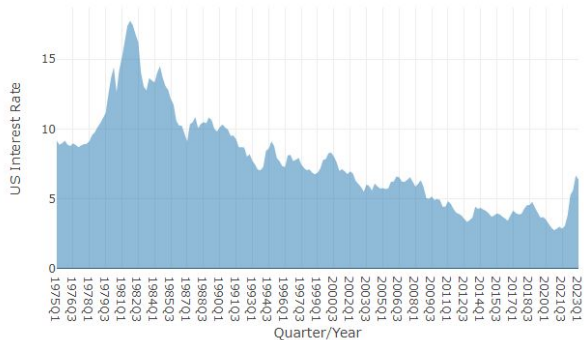
United State Interest Rate annually (1975 - 2022)



Changes of House Price quarterly (1975 - 2022)

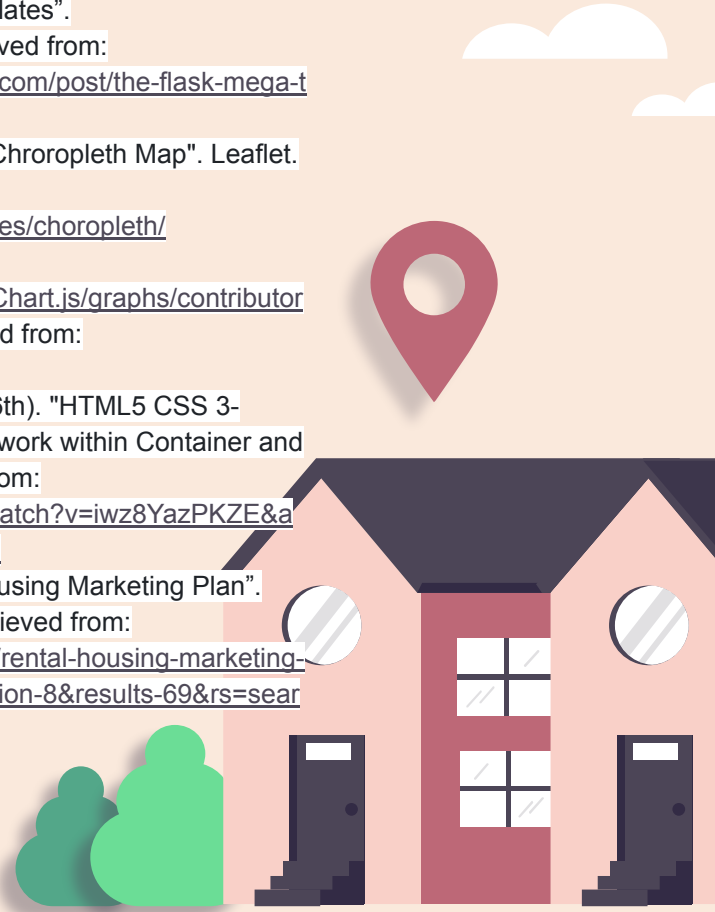


United State Interest Rate quarterly (1975 - 2022)



RESOURCES

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ADDITIONAL RESOURCES

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THANK YOU

DOES ANYONE HAVE ANY QUESTIONS?

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