Analysis Of U.S. Home Prices Over The Last 20 Years

, Our task is identifying key factors that influence U.S. home prices. This involves determining which variables or aspects of the economy and society are likely to have a significant impact on the pricing of homes. Here's a more detailed breakdown:

Key Factors

1. Interest Rates
   - Mortgage interest rates play a crucial role in determining the cost of borrowing for homebuyers. When interest rates are low, borrowing is more affordable, increasing demand for homes and potentially driving up prices.

2. Income Levels
   - The income levels of individuals and households in a region influence their purchasing power. Higher incomes generally enable people to afford more expensive homes, contributing to higher home prices.

3. Unemployment Rates
   - Economic conditions, including unemployment rates, can impact the ability of individuals to buy homes. Higher unemployment rates may lead to decreased demand for homes, affecting prices.

4. Population Growth
   - Regions experiencing population growth often face increased demand for housing. Limited housing supply in the face of rising demand can result in higher home prices.

5. Housing Supply
   - The balance between housing supply and demand is critical. Shortages in housing supply relative to demand can drive up prices, while an oversupply may lead to price declines.

6. Inflation Rates
   - Inflation affects the real value of money over time. High inflation can lead to higher nominal home prices, but it's essential to consider real (inflation-adjusted) prices for a more accurate analysis.

Why Identify These Factors?

- **Holistic Understanding:** By considering a range of factors, you gain a holistic understanding of the economic and demographic landscape that influences the housing market.

- **Predictive Power:** These factors are historically known to impact home prices. Including them in your model can enhance its predictive power.

- **Policy Implications:** Understanding these factors can have implications for policymakers and stakeholders involved in housing and real estate.

Considerations:

- **Local Variation:** Factors' impact can vary significantly across regions. Consider local economic conditions and trends.

- **Data Availability:** Ensure data for these factors is available for the time period you're analyzing.

- **Multicollinearity:** Some factors may be correlated. Be mindful of multicollinearity when modeling.

By identifying and understanding these key factors, We're setting the foundation for building a data science model that explains how these factors have influenced U.S. home prices over the last 20 years.

DATA

We have a data from the year 1987 to 2023.

To analyse the past 20 years data we have taken data from the year 2003 to 2023.

The data is of monthly wise with 2 columns they are DATE and CSUSHPISA.

For analysis of data we have used Python 3.12 with Jupyter Notebook and few required Libraries.

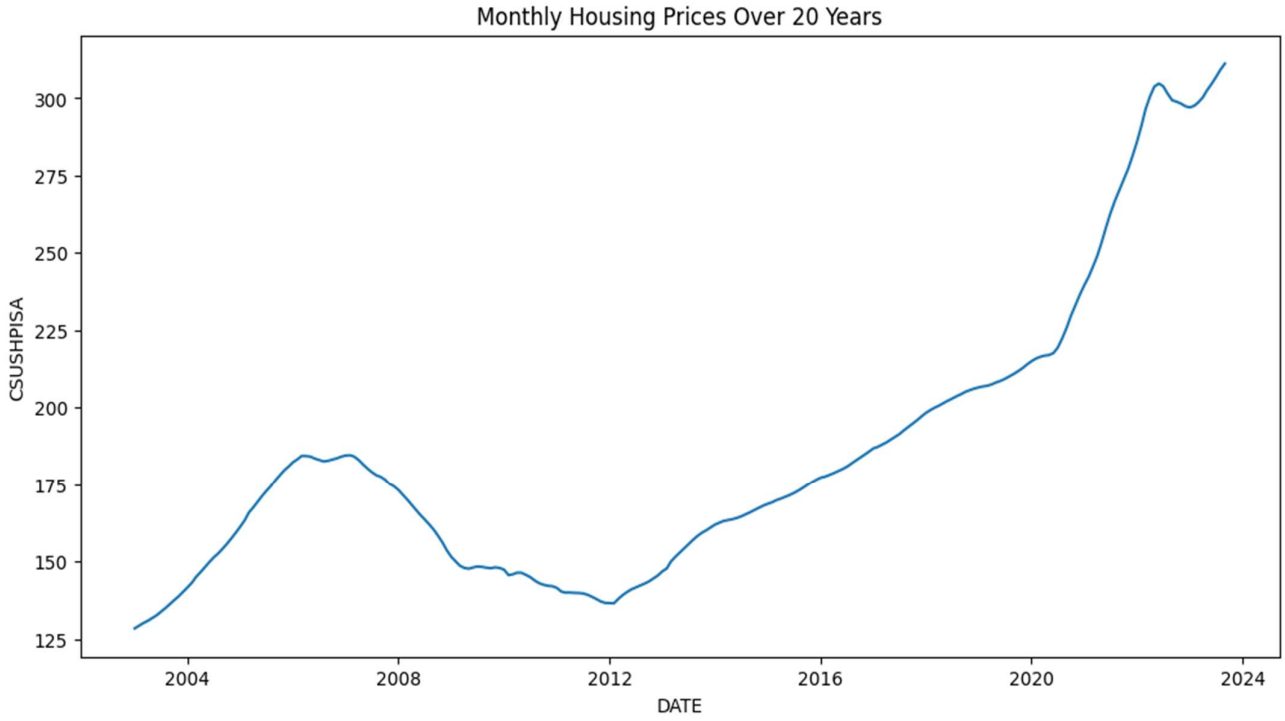
Data Cleaning and Pre Processing

The Data Provided is Completely processed data so there is no need of cleaning and processing of data

The data is in the form of

DATE	CSUSHPISA
2003-01-01	128.461
2003-02-01	129.355
2003-03-01	130.148
2003-04-01	130.884
2003-05-01	131.735

Visual Reprensentation Of Data (Line Chart)

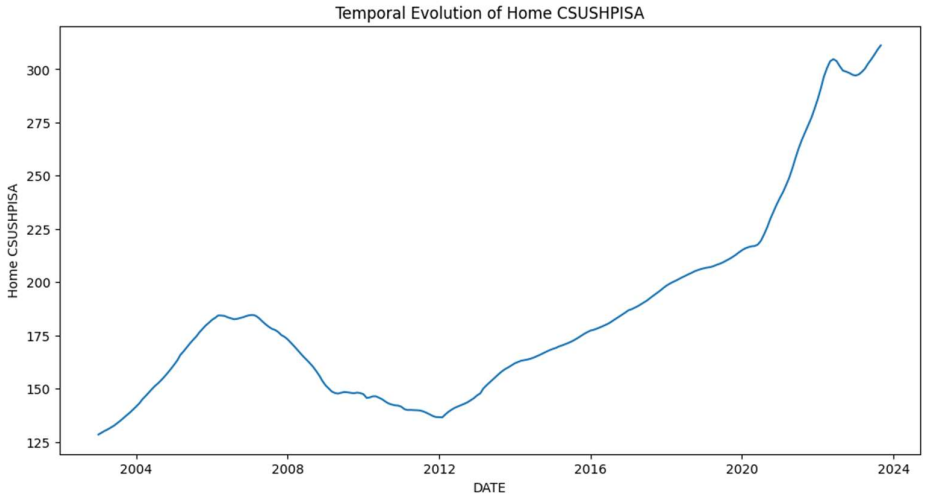


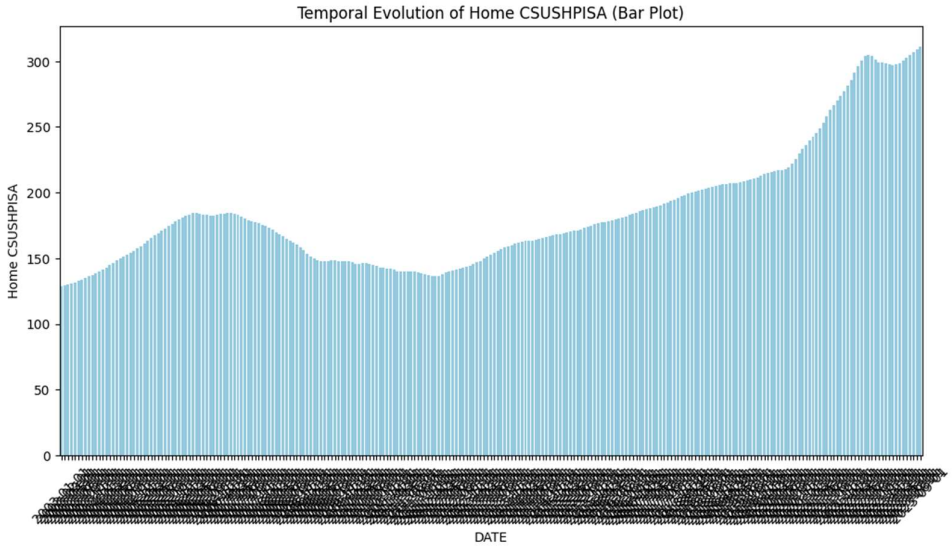
Descriptive Analysis:

To gain a preliminary understanding of the data, we will compute basic descriptive statistics for each key variable. This includes measures such as mean, median, standard deviation, minimum, and maximum values.

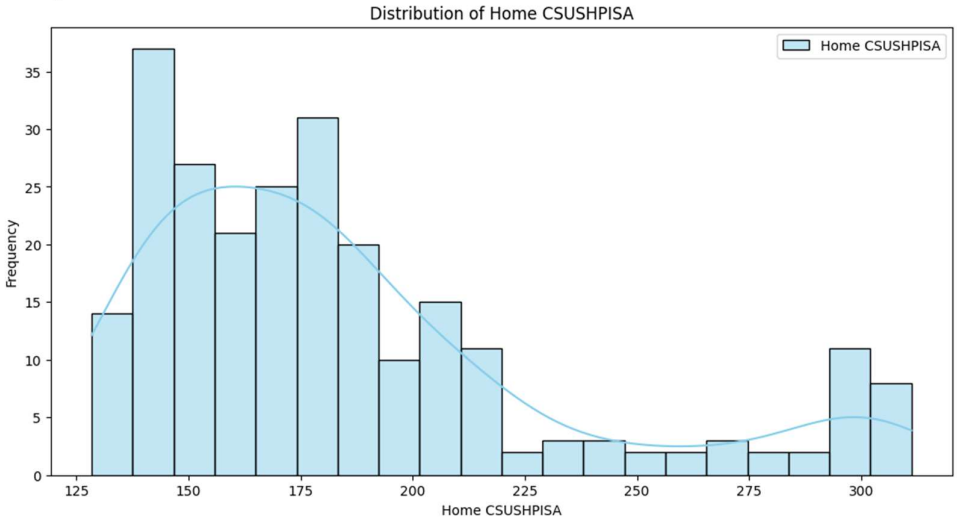
	DATE	CSUSHPISA
count	249	249.000000
mean	2013-05-01	185.081968
min	2003-01-01	128.461000
25%	2008-03-01	148.278000
50%	2013-05-01	174.342000
75%	2018-07-01	202.913000
max	2023-09-01	311.175000
std	NaN	46.531700

Visualization Of Data





Histogram



From Hypothesis Testing

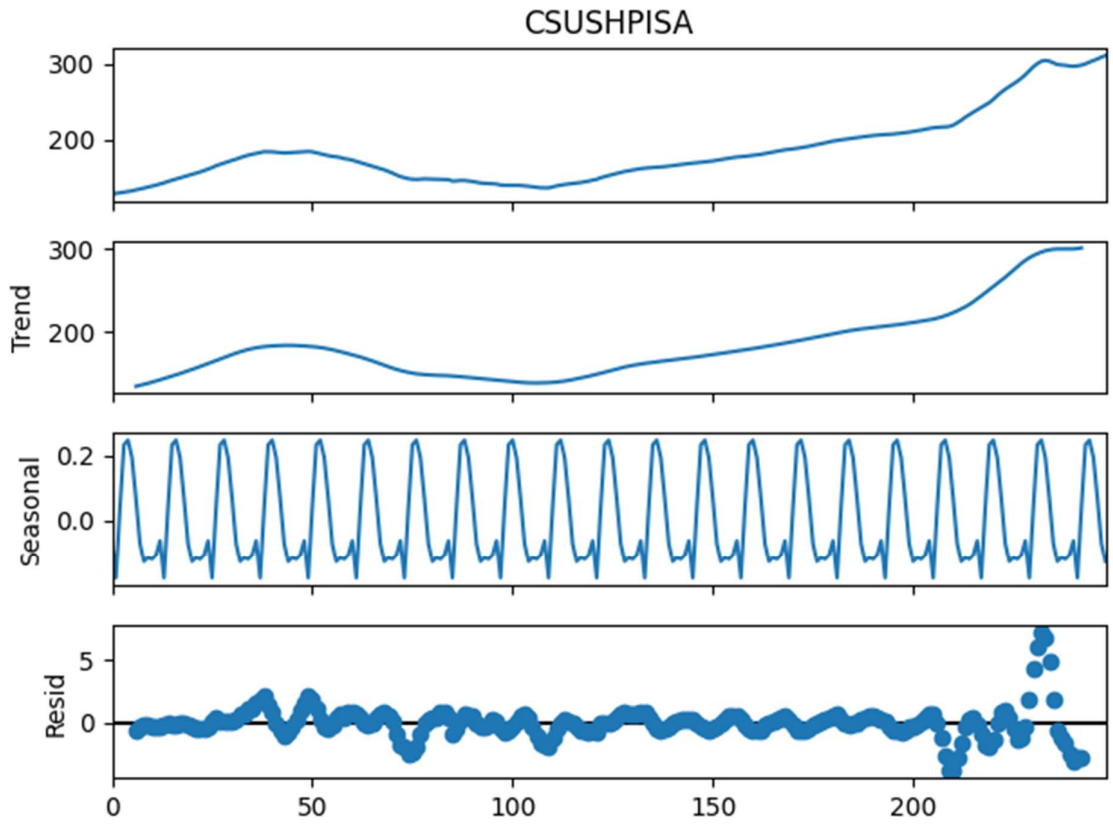
T-Statistic: -12.11895378085251
P-Value: 7.737450652449272e-27
There is a statistically significant difference in home prices before and after the certain date.

Mann-Whitney U Statistic: 0.0
P-Value: 3.498680172368267e-14
The difference in home prices between the two date ranges is statistically significant.

Descriptive Stats

count 249.000000
mean 185.081968
std 46.531700
min 128.461000
25% 148.278000
50% 174.342000
75% 202.913000
max 311.175000
Name: CSUSHPISA, dtype: float64

Seasonal Decompose



Dickey Fuller test for orginal Data

ADF Statistic: 0.24062437755853627
p-value: 0.9744502309176772
The time series is likely non-stationary.

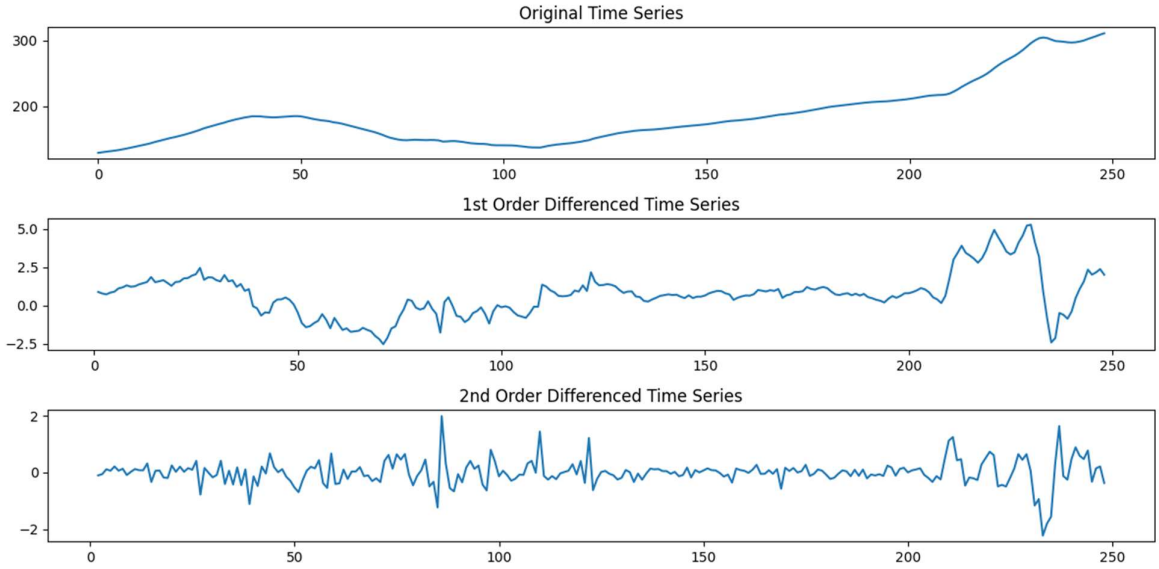
Dickey Fuller test for 1st order differencing

ADF Statistic: -2.060448583610897
p-value: 0.2607127991664336
The differenced time series is likely non-stationary.

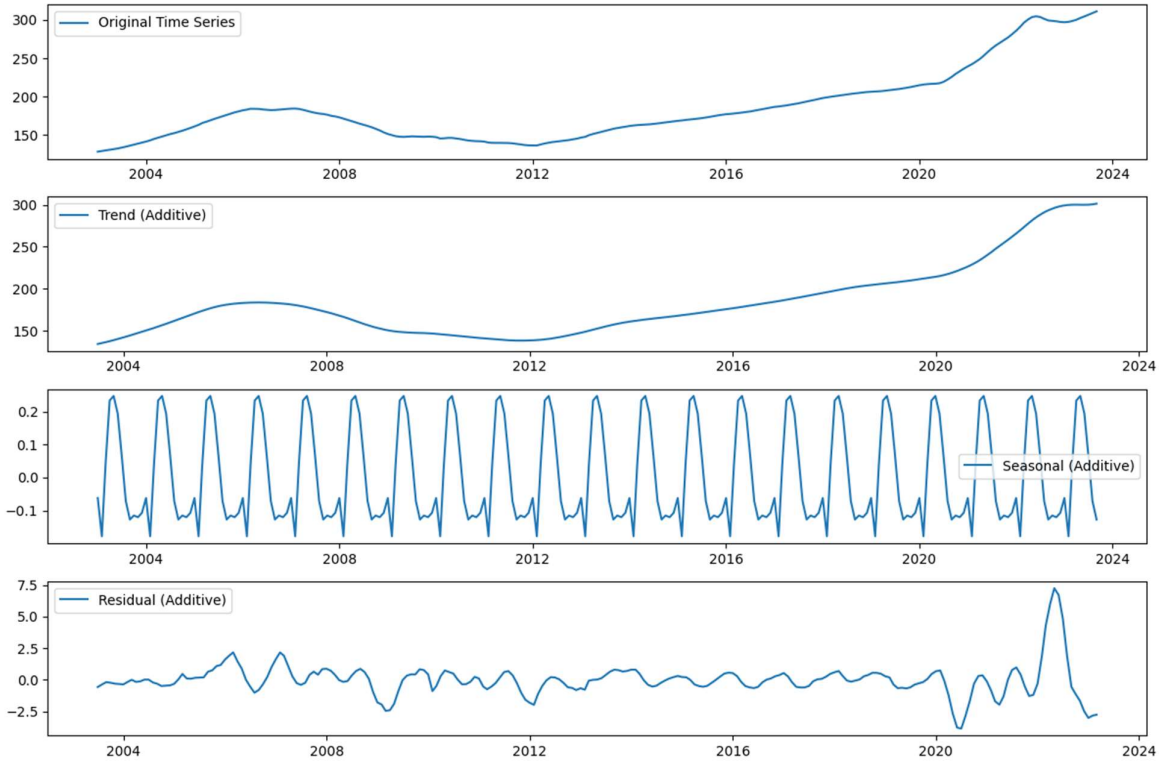
Dickey Fuller test for 2nd order of differencing

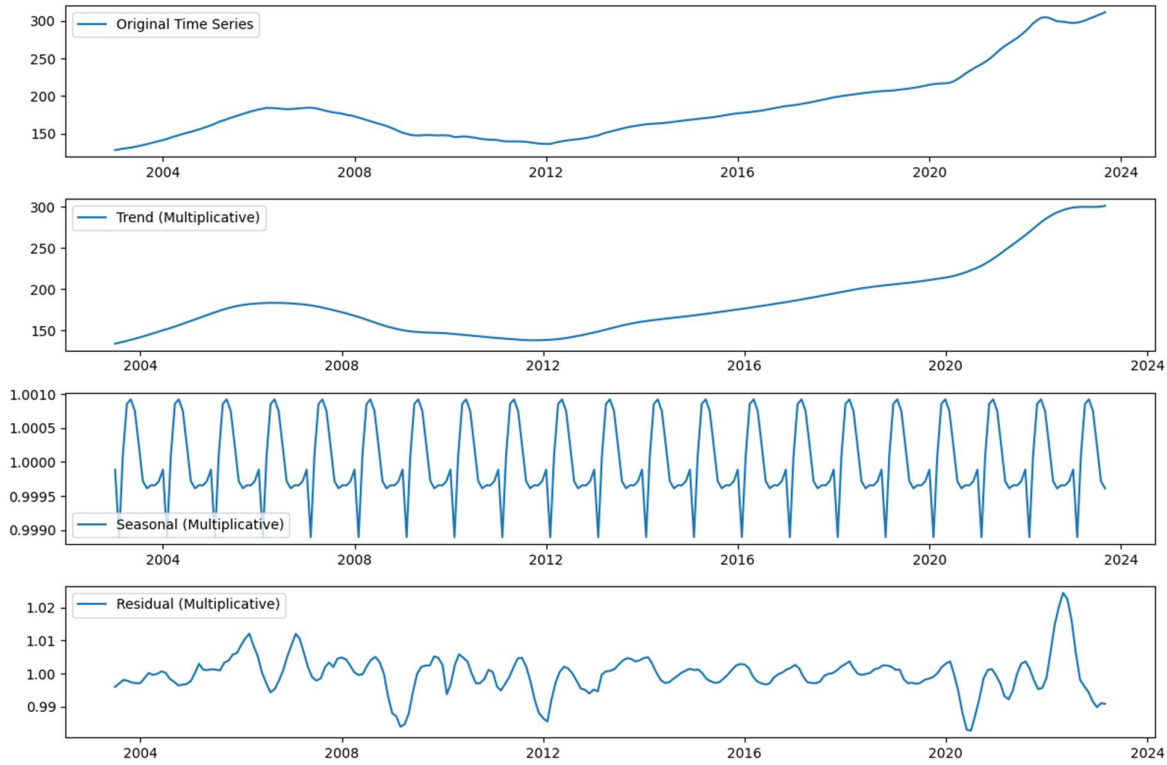
ADF Statistic: -5.666501474617951
p-value: 9.126008425769339e-07
The 2nd differenced time series is likely stationary.

In the second order of differencing the time series is likely stationary



Decomposed Time Series





Observations

- **In 2003 it was started with 128 and now in 2023 it reached 309**
- **The data is a Seasonal Data**
- **There is a down fall in the year 2008 to 2012**
- **We can observe a constant growth from the year 2013**

Analysis

- **There will be many reasons for the up and down of market.**
- **Factors such as banking interest rates, Individual financial stability, Geographic and physographic conditions of the area, Size of property, Cost of living of that area, Near by resources , etc will effect the housing market.**
- **From 2008 to 2012 the market was low due to high bank interests and the salaries of a individuals are also low.**
- **But from 2013 there is a complete change of market. There is no fall of market up to 2023**
- **From 2013 the bank interests are hight but in the same time individual income has also grown parllely**

Note: Buying a home is dream for every individual. To make sales more, the company has to tie-up with the banks which provide low interest rates and also build the houses according to budget of an individual. There are many ways to implement for the high sales which can we discussed in manager round if possible.