

Housing Forecast

DS 4002 Spring 2023 Case Study by Lucy Wang



Housing prices are skyrocketing. Many of those even in the upper middle class are unable to afford or are hesitant to purchase property so quickly. While some may blame inflation and the high demand to supply ratio, purchasing power parity has not kept up to pace and prevented many in becoming property owners. COVID has further elevated these costs, with around an 18.6% increase in prices from before to after the pandemic. While some speculate that housing prices will drop slightly in 2023 as the effects of the pandemic begin to ease off, it is difficult to predict what will actually happen. As the economic state in the real estate market continues to be unsteady, it is becoming more important to be able to predict these trends.

The Federal Housing Finance Agency Housing-Price Index (HPI) is a metric used to track price changes in single-family homes. The time series data set provided indicates changes in HPI values in the US that are both seasonally-adjusted and not seasonally-adjusted. It contains specific quarterly HPI values over all four quarters of every year from 1991 to 2022. Using the entire range provided in the dataset, utilize machine learning methods to predict the trend of housing prices using the HPI metric. Specifically, research and implement some forecasting approach to predict the trend of how housing prices may fluctuate in the near future. Be sure to consider seasonality as a potential factor that may impact the significance of your model.

Deliverable: Develop at least two forecasting models to predict the HPI value of homes in the US. You are free to decide the breakdown of the train and test set, but be sure to support the reasoning of this breakdown based on any data preprocessing and exploratory data analysis performed. Ensure that at least one of these models considers seasonality, and report the accuracy and/or error metric of both. Explain which model gives a better result and give a final recommendation of why that model may be more practical in this specific scenario.