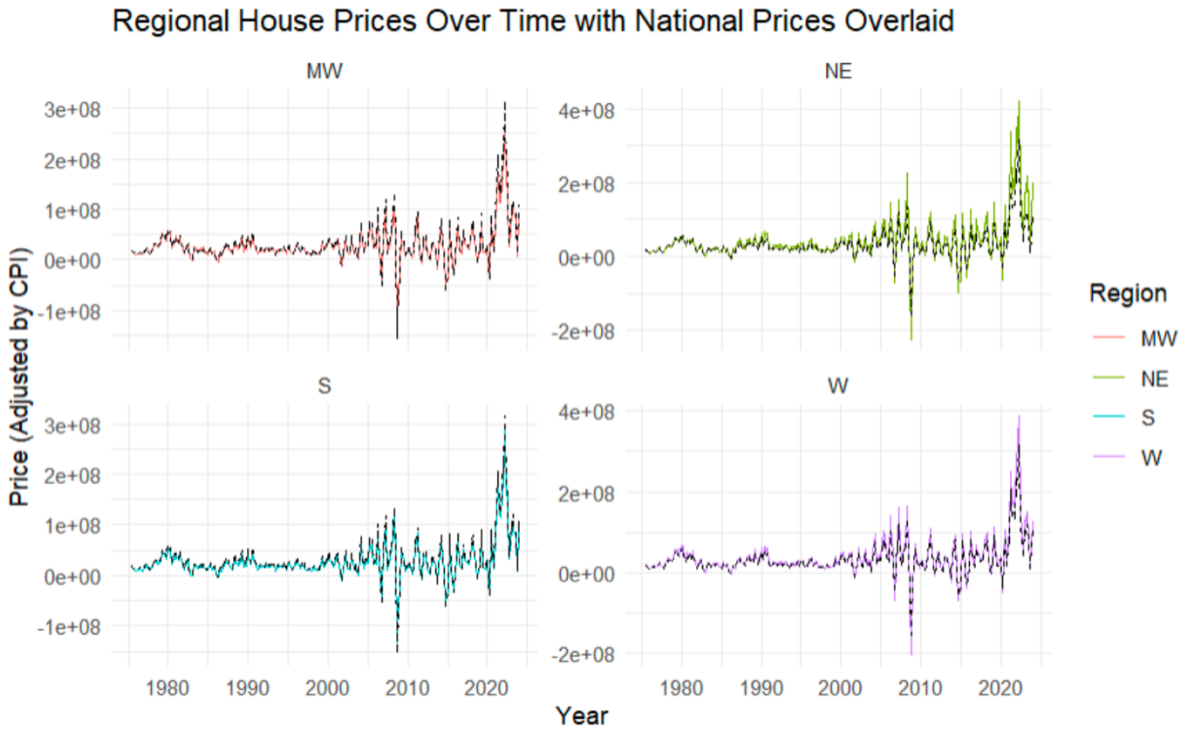

Figure 1: Regional House Prices Over Time with National Prices Overlaid

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This figure shows the trends in house prices over time for different regions in the United States (Midwest, Northeast, South, and West). Each subplot overlays the regional house prices with the national house prices adjusted by CPI (Consumer Price Index). The vertical axis represents the adjusted house prices, and the horizontal axis represents the years. This visualization helps to identify how closely regional house prices align with national trends, highlighting correlations and regional price variations over time.

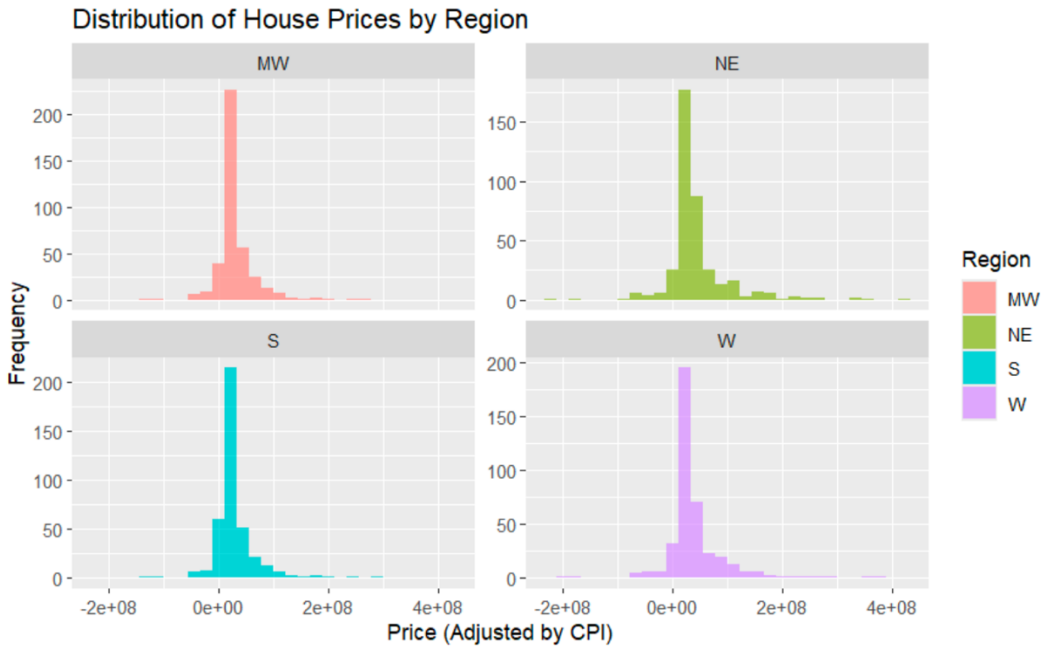

Figure 2: Distribution of House Prices by Region

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This histogram illustrates the distribution of house prices in different regions (Midwest, Northeast, South, and West) adjusted by CPI. The vertical axis represents the frequency of house prices, and the horizontal axis represents the adjusted house prices. Each subplot corresponds to a specific region, with different colors representing different regions. The histograms show that house prices in all regions are positively skewed, with the South showing higher variability due to a mix of urban and rural housing options.

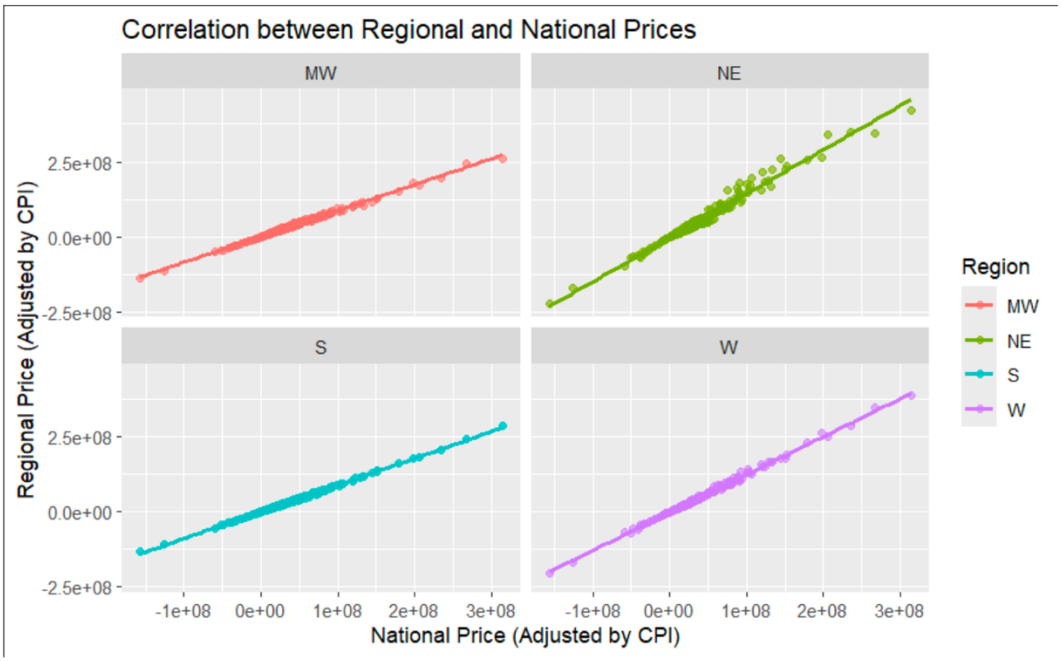

Figure 3: Correlation between Regional and National Prices

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This figure shows scatter plots that illustrate the correlation between regional and national house prices adjusted by CPI. Each subplot corresponds to a specific region (Midwest, Northeast, South, and West). The vertical axis represents the regional adjusted prices, while the horizontal axis represents the national adjusted prices. The strong positive correlation observed in each scatter plot suggests that national pricing trends significantly influence regional pricing trends.

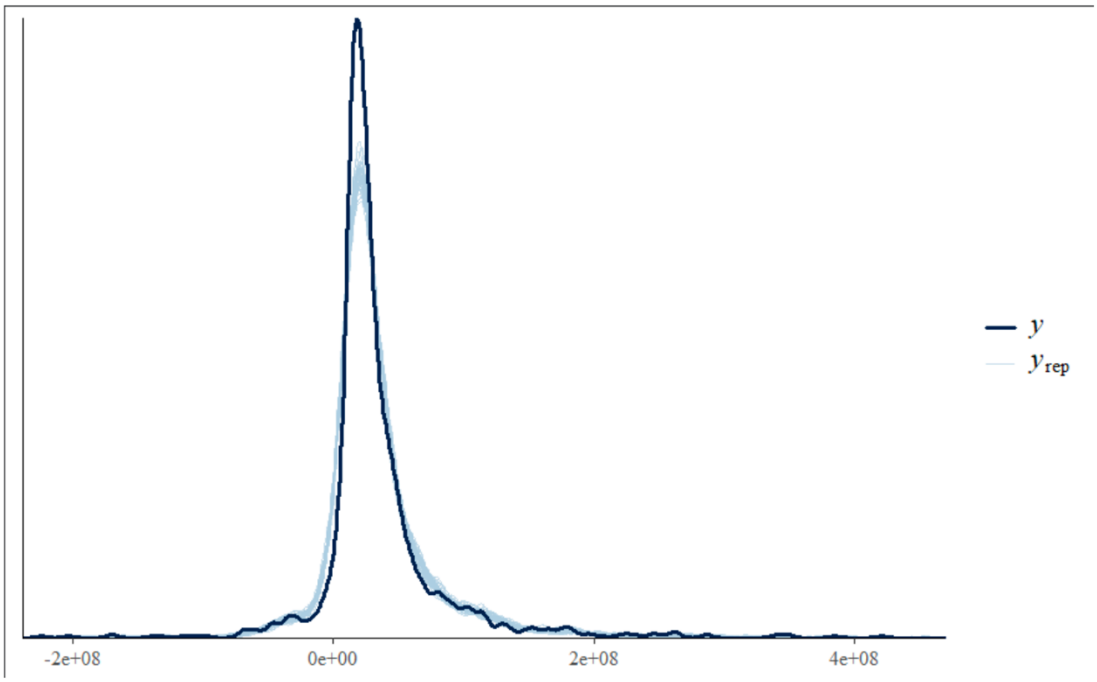

Figure 4: Posterior Predictive Checks

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This figure shows the posterior predictive checks (PPCs) used to evaluate the Bayesian hierarchical model. The PPC plot compares the distribution of the observed data (y) with the distribution of the data generated by the model (yrep). The close alignment of the distributions indicates that the model captures the underlying structure of the data well, suggesting a good fit between the model and the observed data. The vertical axis represents the adjusted house prices, and the horizontal axis represents the frequency of occurrences.

These visualizations collectively provide a comprehensive understanding of regional and national house price trends, distributions, and correlations, supporting the analysis and findings presented in the project.