# House Listing Data Analysis - Visualization Design Document

Website Link:

## Project Overview

This document explains the design choices and rationale behind the visualizations used in the House Listing Data Analysis project. The project analyzes house listings data from across the United States to understand the relationships between property features, location, and listing prices.

## Design Philosophy

The overall design follows a cohesive dark theme with orange accents, creating a modern, professional look while ensuring readability and visual comfort. The dark background reduces eye strain when viewing complex data visualizations and helps the visualization elements stand out. The consistent orange accent color (primarily #ff8d3a) creates a unified brand identity across all pages.

## Responsive Design

The website implements responsive design principles through:

- Flexible container widths (90% with max-width)
- Mobile-friendly navigation that adapts to smaller screens
- Content cards that adjust padding based on screen size
- Visualizations that scale appropriately within their containers

# Individual Visualization Designs

1. House Listing Map (viz1.html)

   Design Approach:

   - Interactive map showing property locations across the US
   - Marker clustering to prevent visual overload in dense areas
   - Click functionality to reveal detailed property information

   Design Rationale: This visualization addresses the spatial distribution question of "where are properties located and how do prices vary geographically?" The map format is the most intuitive way to represent geographic data, allowing users to immediately recognize patterns in property density and pricing across regions.

2. Amenities Scatter Plot (viz2.html)

   Design Approach:

   - Simple scatter plot showing relationship between amenities and price
   - Each point represents an individual listing

   Design Rationale: The scatter plot format effectively shows correlation (or lack thereof) between two variables. This visualization helps users understand if more amenities consistently translate to higher prices, revealing that while there's a positive correlation, it's not strictly linear, suggesting other factors influence pricing.

3. Property Area Scatter Plot (viz3.html)

   Design Approach:

   - Interactive scatter plot relating lot size to price
   - Logarithmic scale to accommodate wide price range
   - Color coding by state for regional comparison

   Design Rationale: This visualization uses the scatter plot format with an additional dimension (color) to show three variables simultaneously: lot size, price, and state. The logarithmic scale is a critical design choice that allows both affordable properties and luxury homes to be visualized in the same space without small values being compressed

into an unreadable area.

4. Choropleth Map (viz4.html)

   Design Approach:

   - Color-coded map showing price ratio (listed/estimated) by state
   - Diverging color scheme (blue-white-red) to show deviations from 1.0

   Design Rationale: The choropleth map is ideal for showing how a single variable (price ratio) varies across geographic boundaries. The diverging color scheme is an intentional design choice that intuitively communicates whether properties are listed above (blue) or below (red) their estimated market values, with neutral values (near 1.0) shown in lighter shades.

5. Average Listing Price by State (viz5.html)

   Design Approach:

   - Bar chart for straightforward comparison of average prices
   - Horizontal layout to accommodate all 50 states
   - Sorted bars for easier identification of highest/lowest values

   Design Rationale: The bar chart is the most effective visualization for comparing a single metric across multiple categories. The horizontal orientation is a deliberate design choice to accommodate the names of all 50 states without text overlap. Sorting the bars by value rather than alphabetically helps users immediately identify highest and lowest values.

## Navigation Design

The navigation emphasizes user orientation and easy movement between visualizations:

- Sticky positioning keeps navigation accessible
- Active page highlighting helps users track location
- Consistent layout reinforces site structure
- Mobile-responsive design maintains usability on small screens

# Conclusion

The visualization design for this project balances effective data communication with aesthetic appeal. Each visualization was carefully selected to match the specific data relationship it represents, with particular attention to:

1. Appropriate visualization types for the data relationships being shown
2. Consistent styling to create a cohesive experience
3. Responsive design for cross-device compatibility
4. Interactive elements where they add analytical value
5. Explanatory text to support data interpretation

The dark theme with orange accents creates a distinctive, professional appearance while ensuring that the data visualizations remain the focus of attention. This comprehensive design approach supports the project's goal of making complex housing market data accessible and interpretable.