# California Housing Market Analysis

Introduction

The California Housing Market Analysis application is an interactive web-based tool built using Streamlit, a Python library for creating data visualization and machine learning web applications. The primary goal of this application is to explore the factors influencing median house values in California through Exploratory Data Analysis (EDA) and insightful visualizations.

Features

- Storytelling Experience: The application presents the analysis in a narrative format, guiding users through the insights and visualizations.

- Interactive Visualizations: Users can explore various visualizations, including scatter plots, pair plots, box plots, and heatmaps, to understand the relationships between features and their impact on median house values.

- User Interaction: Users can interact with the application by clicking a button to view summary statistics of the dataset.

- Responsive Design: The application is designed to be responsive and visually appealing, with a consistent blue theme and custom styling.

- Modular Structure: The application follows a modular structure, with the CSS styles stored in a separate file for easy maintenance and modification.

Setup Instructions

To run the California Housing Market Analysis application locally, follow these steps:

1. Install Python: Ensure that you have Python installed on your machine. You can download the latest version of Python from the official website: https://www.python.org/downloads/

2. Install Required Libraries: Open a terminal or command prompt and navigate to the project directory. Then, install the required libraries using the following command:

```

pip install streamlit pandas matplotlib seaborn scikit-learn

```

3. Download the Application Files: Download or clone the repository containing the application files (`app.py`, `styles.css`, and any other necessary files).

4. Run the Application: In the terminal or command prompt, navigate to the project directory and run the following command:

```

streamlit run app.py

```

This command will start the Streamlit application, and a local server will be launched. A URL will be displayed in the terminal or command prompt, which you can copy and paste into your web browser to access the application.

Code Breakdown

The application consists of two main files:

1. `styles.css`: This file contains the CSS styles for the application, including styles for headings, text, buttons, plot containers, and the footer.

2. `app.py`: This Python file contains the core logic of the Streamlit application. Here's a breakdown of the code:

- Importing Libraries: The necessary libraries (`streamlit`, `pandas`, `matplotlib`, `seaborn`, and `sklearn`) are imported at the beginning of the file.

- Loading the Dataset: The California Housing dataset is loaded using the `fetch\_california\_housing` function from `sklearn.datasets`.

- Page Configuration: The page configuration, including the title, icon, and layout, is set using `st.set\_page\_config`.

- Loading CSS Styles: The CSS styles from the `styles.css` file are loaded and applied to the application using `st.markdown`.

- Title and Introduction: The application's title and introduction are displayed using `st.title` and `st.write`.

- EDA and Visualizations: This section presents the insights and visualizations obtained from the EDA process. Each visualization is accompanied by a descriptive header and explanatory text to guide users through the insights.

- User Interaction: A button is included that allows users to view the summary statistics of the dataset when clicked.

- Footer: A footer section is added with the application's name and copyright information.