Title: Predicting House Prices using Machine Learning

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Project Abstract:

**Objective**: Develop an accurate machine learning model for forecasting house prices, addressing complexities in the real estate market.

**Approach:** Utilize a comprehensive dataset with property attributes and historical pricing data.

Apply machine learning techniques like linear regression, decision trees, and ensemble methods.

**Preprocessing:** Includes data normalization, missing value handling, one-hot encoding, and dimensionality reduction.

**Evaluation:** Use metrics such as Mean Absolute Error (MAE), Root Mean Square Error (RMSE), and R-squared to assess model performance.

**Impact:** Empower real estate professionals, homeowners, and buyers with reliable price predictions, promoting informed decision-making in the housing market.

Design Thinking Process:

**Empathize:**

Understand key stakeholders: Real estate professionals, homebuyers, sellers, data analysts.

Gather insights through interviews and surveys to understand pain points, challenges, and expectations.

Explore specific use cases and benefits of accurate price predictions.

**Define:**

Define a clear problem statement and project goals.

Example problem statement: "Create a house price prediction model for informed decisionmaking by buyers and sellers."

**Ideate:**

Brainstorm features and data sources to improve prediction accuracy.

Encourage interdisciplinary collaboration.

Explore machine learning algorithms and techniques.

Prototype:

Develop low-fidelity prototypes of the prediction model.

Initial feature selection and data preprocessing steps.

Create a simple user interface or visualization.

**Test:**

Gather feedback from stakeholders.

Evaluate usability and accuracy based on user feedback.

Iterate on the model, data preprocessing, and user interface.

Implement and Iterate:

Develop the full prediction model based on insights.

Continuously monitor and gather user feedback after deployment.

Make iterative improvements as needed.

Problem Definition:

The problem at hand is to develop a robust and accurate machine learning model that can predict house prices in the dynamic real estate market. This prediction model aims to address the following key challenges:

Price Variability: The real estate market is known for its price fluctuations influenced by various factors, making it challenging to provide reliable and up-to-date price estimates for properties.

Data Complexity: House prices depend on a multitude of factors, including property size, number of bedrooms and bathrooms, neighborhood characteristics, and historical pricing trends. Managing and leveraging this complex data is essential for accurate predictions.

Informed Decision-Making: Both prospective buyers and sellers in the housing market need access to accurate price estimates to make informed decisions. Real estate professionals also rely on such estimates to provide valuable guidance to their clients.

Transparency: The lack of transparency in the housing market can lead to uncertainty and mistrust among stakeholders. Providing transparent and data-driven price predictions can contribute to increased trust and confidence.