Marketing Analytics
Group 4
Problem Definition and Solution

1. **Identify the Problem Area:**

   Predicting Real Estate Prices for Buying or Renting.

   The real estate market is volatile, and both buyers and renters face challenges in determining the appropriate price for properties. Consumers often rely on intuition or outdated information, leading to suboptimal financial decisions. A platform that accurately predicts house prices can assist both buyers/renters and real estate investors in making informed decisions and helping to set realistic prices. Also, the platform will predict when the house will be approximately sold(time event).

2. **Conduct Preliminary Research:** Housing prices fluctuate due to multiple factors, including location, property size, economic conditions, neighborhood quality, and proximity to schools, shops, and transportation.

   Real estate markets in different locations may show unique trends, such as city vs. suburban pricing or the effects of global economic shifts (e.g., post-pandemic shifts in housing demand).

   Advanced machine learning models are increasingly used to predict housing prices by factoring in large amounts of data, including historical price trends, economic indicators, and neighborhood characteristics.

   Common issues: Lack of comprehensive and up-to-date data, inability to account for highly localized pricing variations, or incorporating subjective aspects such as neighborhood appeal or the condition of a property.

3. **Define a Specific Problem:** Lack of an accurate and reliable platform to predict house prices (for both buying and renting) based on location, property features, market conditions, and other socio-economic factors, ensuring the model adapts to various regions and offers real-time price predictions.

4. **Propose a Solution with Methodology:** Outline a solution that utilizes data analytics techniques. This should include:

a. **Data Collection:** Collect historical real estate transaction data (prices of houses bought and rented in various areas).

       a1. Property attributes: size (square footage), number of bedrooms/bathrooms, lot size, amenities (e.g., swimming pool, garden), age of property, renovation history.

       a2. Location data: neighborhood characteristics, proximity to transport links, schools, shopping centers, crime rates, etc.

       a3. Economic and social factors: local economic conditions (e.g., average household income, unemployment rate), interest rates, housing demand trends.

       a4. Online sources: Web scraping for data on property listings, rental prices, and economic indicators.

b. **Analytical Techniques:** Use linear or non-linear regression models to predict property prices based on numerical factors like property size, number of rooms, etc. Use decision trees or neural networks to predict prices based on multiple features and interaction effects. Customer segmentation can be used to make more personalized predictions. For example, **families** may prioritize proximity to schools.

c. **Implementation Plan:** Develop the platform with an intuitive user interface where users can input property features, location, and preferred property type.

Integrate real-time data updates for housing prices and economic indicators to ensure the predictions remain accurate.

Offer users the option to view predictions based on their inputs, including both buying and renting scenarios.

Use the platform to generate price estimations for any listed property based on the real-time data processed through the model.

Implement feedback loops where users can report discrepancies between predicted prices and actual prices, which can be used to improve model accuracy over time.

5. **Expected Outcomes:**

a. Accurate Price Predictions: Buyers and renters will receive more accurate price estimates, helping them make better financial decisions when purchasing or renting a property.

b. Real-time Price Adjustments: The platform will adapt quickly to changes in the market, incorporating up-to-date data to provide relevant predictions.

c. Increased User Trust: Real estate investors and regular buyers/renters will be more confident in their decisions, knowing they are relying on a data-driven tool.

d. Market Efficiency: The platform will reduce the time and effort spent searching for reasonable prices, thus improving the overall efficiency of the real estate market.

e. Strategic Partnership: List.am will integrate our platform directly into their system to enhance their listings with AI-powered price prediction. We are going to initiate discussions with List.am's founder, conduct in-depth research on their operations, and focus on using their real historical data for predictions.

6. **Evaluation Metrics:**

KPI 1: Prediction Accuracy – Measure the Mean Absolute Error (MAE) or Root Mean Squared Error (RMSE) between predicted and actual house prices.

KPI 2: User Engagement – Track the number of active users, interactions with the platform, and user feedback on accuracy.

KPI 3: Conversion Rate – Measure how many users transition from exploring predictions to actually purchasing or renting properties based on platform recommendations.

KPI 4: Model Improvement – Track the model's accuracy over time, ensuring that new data and user feedback continually improve the system's performance.