| **Project Title** | Predicting Housing Market Trends: A Data-Driven Approach to Price Forecasting |
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| **Group** | DSCI\_2025\_TEAM-E |
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| **External Advisor (if any)** |  |

**Background***: Describe the problem or topic area the project will address*

The real estate market is very important for the economy. It affects individual financial decisions and the overall economic stability of regions and countries. One of the main challenges in this sector is predicting property prices accurately. Housing prices depend on factors like location, size of the property, number of rooms, age of the property, and other external factors such as nearby amenities, neighborhood, and economic conditions.

Traditionally, real estate experts use these factors to estimate prices, but this can be slow, subjective, and prone to mistakes. Machine learning can solve this problem by using algorithms that learn from historical data and make accurate predictions. By training a model with a large dataset, we can find patterns in the factors that affect housing prices. The goal of this project is to build a machine learning model that can predict housing prices based on property features and market conditions.

**Significance:** *Explain why this problem is important and relevant*

Accurately predicting housing prices is very important for everyone involved in the real estate market, like home buyers, sellers, investors, and lenders. For buyers and sellers, accurate price predictions help them make better decisions about when to buy or sell, how much to offer or ask for, and how to negotiate. Investors need to understand market trends to make smart investments. Banks and mortgage companies also use price predictions to assess the risk of loans and set interest rates.

Accurate predictions make the real estate market more efficient. They help reduce price fluctuations and make the market easier to understand for buyers and sellers. Machine learning offers faster and more scalable predictions than traditional methods. By analyzing large amounts of data, machine learning models provide more accurate insights, especially in markets where prices change quickly and unpredictably.

**Objective:** *Define the specific goals or questions the project aims to address*

The goal of this project is to conduct exploratory analysis, visualize data, and develop a machine learning model to predict housing prices based on various factors such as property features, location, and market conditions. The project will focus on the following objectives:

1. **Preprocess and Analyze Data:**
   * Collect and clean a detailed dataset that includes property details (such as size, number of rooms, age, and location) and external factors (like neighborhood quality, proximity to amenities, and market conditions).
   * Explore and visualize the data to understand how different features relate to housing prices.
2. **Develop and Train Machine learning model:**
   * Use different machine learning algorithms to train the model on the housing data.
   * Use evaluation metrics to assess how well the model predicts housing prices on test data and rework if required.
3. **Feature Importance Analysis:**
   * Identify the most important features that affect housing prices.
   * Provide insights into how these features influence the final price of properties.

The main goal of this project is to develop a strong, data-driven machine learning model that can offer accurate, actionable insights about housing prices, helping people in the real estate industry make better decisions.

Datasets:- In progress and ongoing research

1. <https://www.bea.gov/data/income-saving/personal-income-county-metro-and-other-areas>
2. [Housing Data - Zillow Research](https://www.zillow.com/research/data/)
   * Zillow Home Value Index (ZHVI)  
     • Zillow Home Value Forecast (ZHVF)  
     • USA State map  
     • City Latitude and Longitude.