**1. Problem Statement**

* The real estate market is influenced by various factors, making price estimation complex.
* Traditional valuation methods may not be accurate or adaptable to market fluctuations.
* A data-driven approach can help provide precise and dynamic price predictions.

**2. Objectives**

* **Accurate Price Estimation:** Prediction of property prices using historical data and market trends.
* **Feature Analysis:** Identifying key factors affecting real estate prices (location, amenities, and economic trends).
* **User-Friendly Interface:** Develop a web or mobile app for easy access to predictions.

**3. Data Collection**

* **Sources:** Government property databases, real estate websites (Zillow, Realtor.com), MLS listings, open datasets.
* **Features:**
  + Location (city, neighbourhood, zip code, latitude, longitude)
  + Property size (square footage, lot size)
  + Number of bedrooms and bathrooms
  + Property type (apartment, house, villa, condo)
  + Year built and condition of the property
  + Market trends (interest rates, inflation, economic indicators)
  + Nearby amenities (schools, hospitals, public transport, shopping centres)

**4. Data Pre-processing**

* Handling missing values
* Data normalization and transformation
* Feature selection and engineering
* Outlier detection and removal

**5. Machine Learning Models**

* **Regression-Based Models:**
  + Linear Regression
  + Decision Trees
  + Random Forest
  + XGBoost
* **Deep Learning Models:**
  + Artificial Neural Networks (ANN)
  + Long Short-Term Memory (LSTM) for time-series forecasting
* **Comparing Model Performance:**
  + Evaluation metrics (MAE, MSE, RMSE, R² score)
  + Cross-validation for better accuracy

**6. Deployment**

* **Web Application:** Build a Streamlit app to predict property prices based on user inputs.

**7. Challenges & Improvements**

* Handling data bias and outliers
* Real-time price updates
* Expanding to different geographical regions
* Adding external factors (economic policies, interest rates, inflation)