**HOUSE PRICE PREDICTION**

**Phase 1:Problem Definiton and Design Thinking**

**(Team Head)**

**SATHYASEELAN M**

**au711021104046**

**(Team members)**

**JEYAKANDHAN PG**

**au711021104017**

**JUDAHSAMUEL O**

**au711021104017**

**RAJESH R**

**au711021104036**

**SATHOSHKANNA R**

**au711021104044**

Problem Definiton:

The housing market is a pivotal sector that profoundly impacts individuals and families by representing one of the most substantial investments in their lifetimes. Accurate house price prediction is paramount to empower both buyers and sellers with the information they need to make well-informed decisions. This project aims to leverage machine learning techniques to predict house prices based on a comprehensive set of features, including but not limited to location, square footage, number of bedrooms and bathrooms, and other pertinent factors.

**Design Thinking:**

Collection Data and Integration**:**

We will collect and consolidate a diverse dataset comprising historical housing information, encompassing details such as property characteristics, transaction history, and location attributes. This dataset will serve as the foundation for our predictive model.

Data Preprocessing and Feature Engineering:

Prior to modeling, we will preprocess the data, addressing issues such as missing values, outliers, and feature scaling. Additionally, we will engineer new features to extract valuable insights and relationships from the raw data.

Model Development:

Employing state-of-the-art machine learning algorithms, including but not limited to linear regression, decision trees, and gradient boosting, we will develop predictive models capable of estimating house prices accurately.

Hyperparameter Tuning:

To optimize model performance, we will conduct hyperparameter tuning using techniques such as grid search or random search, ensuring that our models are fine-tuned to the specific characteristics of the data.

Model Evaluation:

We will rigorously evaluate the models using appropriate evaluation metrics like Mean Absolute Error (MAE), Mean Squared Error (MSE), and Root Mean Squared Error (RMSE) to assess their predictive accuracy.

Validation and Testing:

To measure the model's generalization capabilities, we will validate its performance on a holdout testing dataset, assessing its ability to make accurate predictions on previously unseen data.

Interpretability and Explainability:

In addition to predictive accuracy, we will aim to make our models interpretable and explainable, enabling stakeholders to understand the rationale behind the price predictions.

Ethical Considerations:

We will proactively address potential biases in the data to ensure fairness in predictions, avoiding discrimination related to factors such as race, gender, or socioeconomic status

Privacy and Security:

The handling of sensitive data, including personal information, will strictly adhere to privacy regulations and security best practices.

Deployment and Integration:

Once a satisfactory model is achieved, we will deploy it in a production environment where it can provide real-time house price predictions, potentially integrated into a user-friendly platform.

Continuous Monitoring and Maintenance:

Regular model updates, data refreshes, and performance monitoring will be conducted to ensure the model remains accurate and relevant over time.