



BANGLADESH ARMY UNIVERSITY OF SCIENCE & TECHNOLOGY (BAUST)
SAIDPUR, NILPHAMARI

Department of Computer Science and Engineering (CSE)

Course Code: CSE 4140

Course Title: Machine Learning Sessional

Project Title: House Price Prediction

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Outline

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Introduction

- House prices depend on several factors such as location, total area, number of rooms, and the condition of the house. Because these factors vary from one property to another, estimating prices manually often becomes confusing and inaccurate.
- Machine Learning provides a reliable way to analyze housing data and predict prices based on learned patterns. A prediction model can help users get faster, unbiased, and more accurate price estimates.
- This project aims to build a simple and effective system that can predict house prices using key property features.

Problem Statement

- House buyers and sellers struggle to estimate fair market prices.
- Prices vary widely due to location, area size, and property age.
- Manual judgment is biased and often inaccurate.
- Need a simple ML-based system that predicts price from essential house features.

Objectives

- 01 Collect a clean and structured housing dataset.
- 02 Preprocess the data (cleaning, encoding, handling missing values).
- 03 Train an ML model to learn price patterns.
- 04 Identify which features strongly influence house price.
- 05 Build a simple prediction system for users.

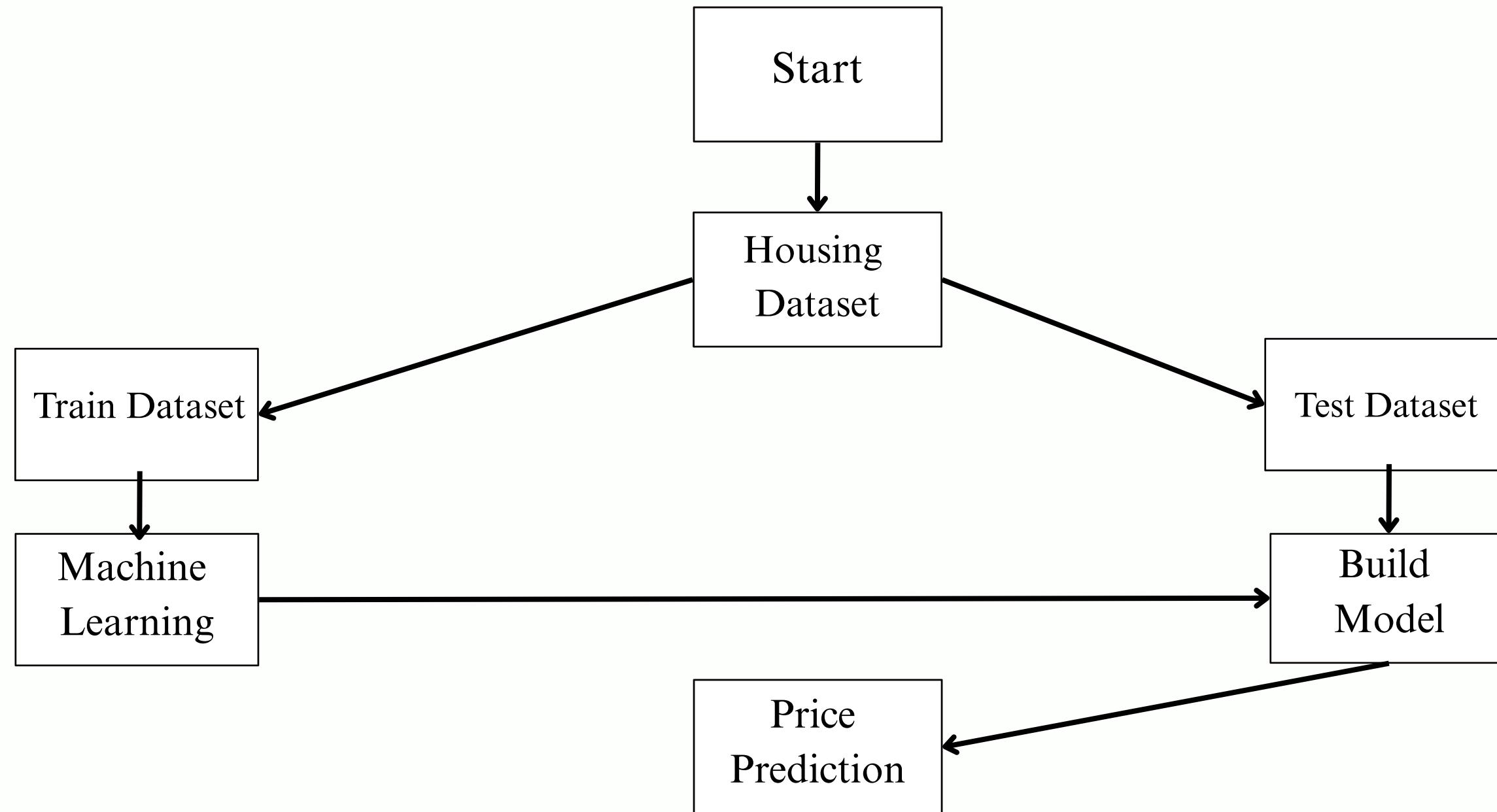
Related Works

No.	Name	Authors	Abstract	Models Used	Accuracy	Limitations
01	House Price Prediction Using Machine Learning	UJJWAL KUMAR, RISHU KUNWAR, DR. NEHA GARG	The study evaluates ML algorithms for predicting house prices and finds that Random Forest performs best. It analyzes how features influence price and emphasizes proper preprocessing.	Linear Regression, Lasso Regression, SVM, Random Forest, XGBoost	Random Forest: 90.35% (Best)	<ul style="list-style-type: none"> Dataset-dependent performance Poor SVM accuracy shows sensitivity to scaling & non-linearity Geographic bias — may not generalize to other cities Requires more feature engineering for higher accuracy
02	Machine Learning Approach for House Price Prediction	Mudavath Jagan Chowhaan, D. Nitish, G. Akash, Sreevidya Nelli	The paper develops a house-price prediction model for a website using ML algorithms and market trends. Data is preprocessed, evaluated, and compared to find the best model for price prediction.	Linear Regression, Decision Tree, Random Forest, Support Vector Regression (SVR)	Random Forest: $R^2 = 0.90$ (Best)	<ul style="list-style-type: none"> Training slows significantly with larger datasets Limited features (only rooms, bathroom, location) Overfitting risk in Decision Trees SVM underperforms due to feature scaling issues Lack of diversity in samples reduces real-world applicability

Scope and Limitations

Scope	Limitations
<ul style="list-style-type: none">Focus on predicting house prices in Saidpur.	<ul style="list-style-type: none">Linear Regression struggles with outliers and non-linear patterns.
<ul style="list-style-type: none">Uses essential real estate features.	<ul style="list-style-type: none">Dataset may lack some real geographic features.
<ul style="list-style-type: none">Applies Linear Regression for simplicity and interpretability.	<ul style="list-style-type: none">Accuracy depends heavily on the quality of input data.

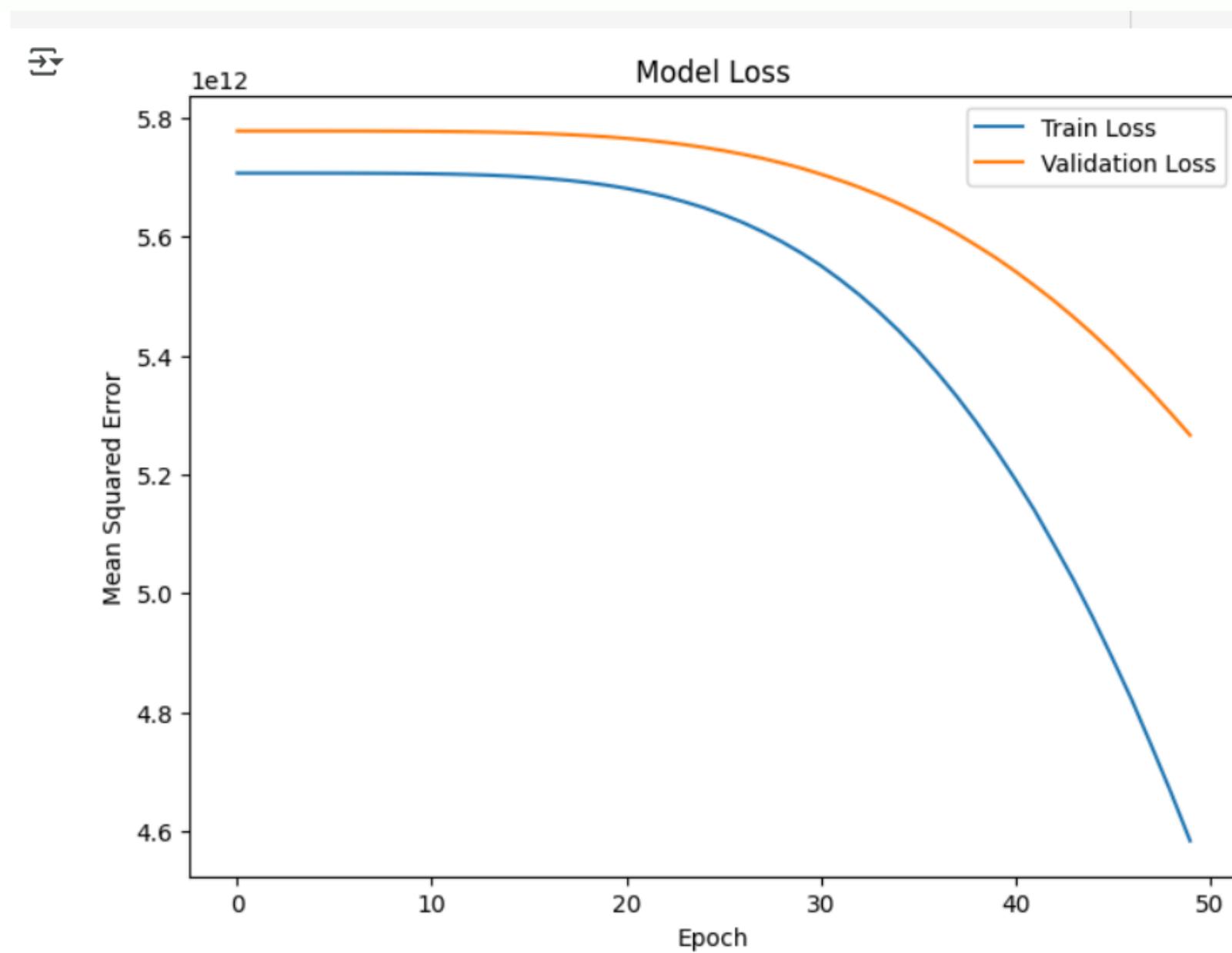
Methodology



Performance & Result

- Test MAE (Mean Absolute Error): e.g.,
~XXXX Taka
- R² Score: e.g., 0.85 (closer to 1 is better)

Loss Curve:



Sample Predictions

1/1 ————— 0s 35ms/step

Test Sample 1:

Features: Bedrooms=3, Bathrooms=2, Floor_Number=2, Floor_Area=1200

Predicted Price: 206792.98 Taka

Test Sample 2:

Features: Bedrooms=2, Bathrooms=1, Floor_Number=3, Floor_Area=1000

Predicted Price: 197659.62 Taka

Expected Outcomes

- A functioning ML model capable of predicting house prices.
- Understanding of how features like location and area affect price.
- Cleaned and prepared dataset for future enhancement.
- Simple user-friendly prediction system.

❖ Challenges ❖

- Handling missing or inconsistent data.
- Outlier removal without losing useful data.
- Selecting features that meaningfully affect price.
- Ensuring good accuracy with limited dataset.



Conclusion

- Successfully built an ML model to predict house prices in Saidpur.
- Linear Regression worked effectively after proper preprocessing.
- System provides fast and reasonable price estimates.
- Helps in decision-making for buyers and sellers.



References

- UJJWAL KUMAR, RISHU KUNWAR, DR. NEHA GARG “House Price Prediction Using Machine Learning”, 2023
<https://www.ijnr.org/papers/IJNRD2307298.pdf>
- Mudavath Jagan Chowhaan, D. Nitish, G. Akash, Sreevidya Nelli “Machine Learning Approach for House Price Prediction”, 2022
https://www.researchgate.net/publication/371602053_Machine_Learning_Approach_for_House_Price_Prediction



Thank You

Any Questions?