Title of the Project

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Introduction

- The real estate industry is influenced by various factors such as economic conditions, political stability, demographics, and technology, among others.
- The ability to predict real estate prices accurately can be useful for various stakeholders such as buyers, sellers, and investors.
- In the real estate industry, machine learning algorithms can be used to develop models for real estate price prediction.

Objectives and Challenges

- This research paper aims to develop and compare various machine learning models for real estate price prediction in three Indian cities - Chennai, Bengaluru, and Delhi.
- Some challenges are:

- Managing 3 different datasets with uncommon columns
- Removing Outleirs
- Dealing with Nan Values

Our Approach

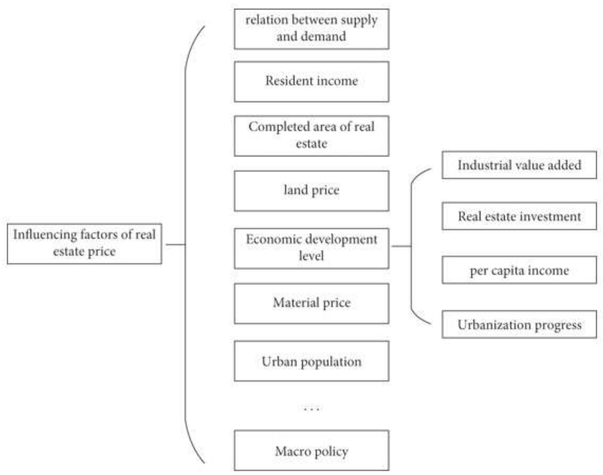


Fig. 1 Index Factors affecting real estate prizes

- Linear Regression: It assumes a linear relationship between the independent and dependent variables and aims to find the best fit line to predict the target variable.
- Decision Tree: It works by recursively partitioning the data into smaller subsets based on the features to predict the target variable.
- Lasso Regression: This model uses shrinkage. Shrinkage is where data values are shrunk towards a central point as the mean. The lasso procedure encourages simple, sparse models (i.e. models with fewer parameters).

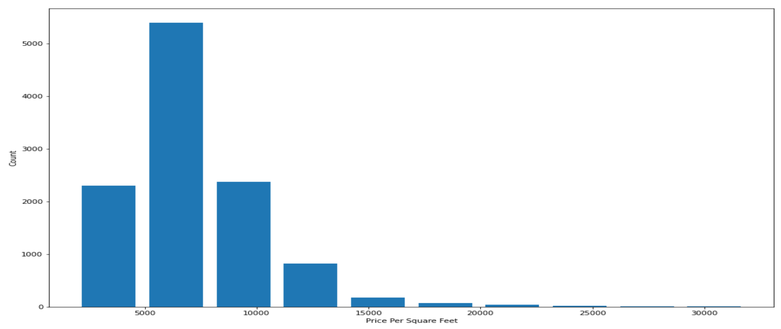
Results

```
[194]: predict_price('1st Phase JP Nagar',1000, 2, 2)
       c:\users\anubhab\appdata\local\programs\python\python39\lib\site-packages\
       nearRegression was fitted with feature names
         warnings.warn(
[194]: 81.80288347852803

[170]: predict_price('Indira Nagar',1000, 3, 3)
       c:\users\anubhab\appdata\local\programs\python\python39\lib\site-packages\
       nearRegression was fitted with feature names
         warnings.warn(
[170]: 178.2198177230117

[174]: predict_price('Karapakkam',1000, 3, 3)
       c:\users\anubhab\appdata\local\programs\python\python39\lib\site-packages\
       nearRegression was fitted with feature names
         warnings.warn(
[174]: 71.2640470677168

[177]: predict_price('Shivaji Nagar',1000, 3, 3)
       c:\users\anubhab\appdata\local\programs\python\python39\lib\site-packages\
       nearRegression was fitted with feature names
         warnings.warn(
[177]: 75.71646050647018
```



ALGORITHM	CHENNAI (X)	BENGALURU (Y)	DELHI (Z)	ALL TOGETHER (X+Y+Z)
LINEAR REGRESSION	0.845574	0.818354	0.897554	0.849693
DECISION TREE	0.741746	0.725728	0.799807	0.696853
LASSO REGRESSION	0.799029	0.687439	0.870960	0.623923

Discussion

- There are many factors affecting real estate prices, such as market supply and demand, wage income, and economic development level.
- There is a complex relationship between these influencing factors..
- The research uses the information gain method to extract the principal components.

Conclusion and Future Scope

- This research paper developed and compared various machine learning models for real estate price prediction in three Indian cities - Chennai, Bengaluru, and Delhi.
- The models were trained using various algorithms such as Linear Regression, Decision Tree and Lasso Regression.
- Future work can include incorporating more features such as the age of the property, amenities, and nearby infrastructure to improve the accuracy of the models.

References

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2. _Real Estate Price Prediction using Supervised Learning. (2022b, December 15). IEEE Conference Publication | IEEE Xplore. https://ieeexplore.ieee.org/abstract/document/10014818
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4. Tchuente, D., & Nyawa, S. (2021). Real estate price estimation in French cities using geocoding and machine learning. Annals of Operations Research, 308(1–2), 571–608. https://doi.org/10.1007/s10479-021-03932-5