Review of
House Rent Price Prediction

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INTRODUCTION

The prediction of house rent prices has become a crucial area of study due to the increasing urbanization and growing demand for housing. Accurate rent predictions benefit both tenants and landlords by ensuring fair market values. House rent prices are influenced by several factors such as location, size, number of rooms, availability of amenities, and proximity to public services. The primary goal of this research is to develop a predictive model that accurately estimates house rent prices based on these factors.

This paper explores various machine learning models for predicting house rent prices, analyzes their performance, and discusses the most significant factors contributing to rent price variations.

OBJECTIVE

The primary objectives of this study are to:

1. Analyze the factors influencing house rent prices.
2. Develop a machine learning model to predict house rent prices based on multiple features.
3. Compare the performance of different machine learning algorithms in predicting house rent prices.

HYPOTHESIS

The study hypothesizes that house rent prices can be accurately predicted using a machine learning model based on various housing-related features such as location, size, number of bedrooms, and access to amenities. It is also hypothesized that certain features (like proximity to public transport and size of the house) will have a more significant impact on rent prices than others.

STUDY DESIGN/METHODOLOGY

This study employs a combination of data-driven machine learning approaches and statistical analysis to predict house rent prices. The research involves the following steps:

1. **Data Collection**:
   The dataset used for this study is collected from online housing platforms, government housing reports, and real estate listings. It includes various features such as location, size (square feet), number of bedrooms and bathrooms, presence of amenities (gym, parking), and distance from important places like schools, hospitals, and transport stations.

2. **Data Preprocessing**:
   The data is cleaned and preprocessed to handle missing values, outliers, and categorical variables. Features are transformed into a suitable format for machine learning models.

3. **Model Development**:
   Several machine learning algorithms, such as Linear Regression, Decision Trees, Random Forest, and Gradient Boosting, are implemented to develop predictive models for house rent prices.

4. **Model Evaluation**:
   The models are evaluated using performance metrics such as Root Mean Squared Error (RMSE), Mean Absolute Error (MAE), and R-squared (R^2) score. A comparison is made to identify the best-performing model for accurate rent price prediction.

KEY FINDINGS

The key findings of the study highlight the importance of various factors in predicting house rent prices:

1. **Location**:
   Location was found to be the most significant factor influencing house rent prices. Houses located in central business districts or near public

transportation had higher rental prices.

2. **Size of the Property**:
   Larger properties, in terms of square footage and the number of bedrooms, tend to have higher rent prices, particularly in urban areas.

3. **Amenities**:
   The availability of additional amenities such as parking, gyms, and swimming pools also significantly increased rent prices.

4. **Proximity to Public Services**:
   Properties located close to schools, hospitals, and shopping centers showed a positive correlation with rent prices.

CONCLUSION

The research demonstrates that machine learning models, specifically Random Forest and Gradient Boosting, provide accurate predictions of house rent prices based on multiple factors. Among the models tested, Gradient Boosting had the lowest prediction error, making it the most effective algorithm for this dataset.

The study also shows that location, property size, and amenities are the most influential factors in determining house rent prices. Policymakers, real estate agents, and individuals can use these findings to make informed decisions regarding house rentals.

Further research could explore the impact of dynamic market conditions and economic factors, such as inflation and interest rates, on house rent predictions. Integrating real-time data into predictive models could also enhance the accuracy of future predictions.

REFERENCES

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