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| Enhancing Predictive Accuracy in Airbnb Pricing  A Comparative Study of Models and Techniques |  |
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# PREDICTIVE MODELING FOR AIRBNB LOG PRICE

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| **ENHANCING ACCURACY THROUGH ENSEMBLE TECHNIQUE** Improving predictive accuracy in Airbnb price forecasting is essential for stakeholders to make better pricing decisions and understand the key factors affecting price variations.  **CONCLUSIONS AND INSIGHTS**   1. **Feature Engineering and Aggregation:** Grouping similar features (e.g., *room\_type*, *city*, *zipcode*) and analyzing their aggregated importance provides valuable insights into price determinants. 2. **Outliers' Role in Prediction:** Feature outliers significantly influence model performance and predictions in price forecasting. 3. **Ensemble Models Enhance Predictive Accuracy:** Combining models like Random Forest, Gradient Boosting, and Multi-Layer Perceptrons (MLP) through weighted averaging yields slightly superior performance compared to the best individual model. 4. **Optimized Weights Improve Model Performance:** Constraining ensemble weights and optimizing through techniques like SLSQP ensures balanced contribution from models, avoiding over-reliance on a single model.   **MODEL UTILIZATION STRATEGIES**  **How to Use the Modeling Results**   1. **For Hosts:**    * Leverage feature insights (*e.g., amenities cluster or property type*) to identify areas for investment or improvement to optimize listing prices.    * Use predictive models to set competitive yet profitable prices. 2. **For Platform Operators:**    * Use high-performing ensemble models to suggest pricing strategies for new or inactive listings, improving market equilibrium.    * Regularly update predictive systems to incorporate evolving market trends, ensuring accuracy in recommendations. 3. **For Data Analysts:**    * Apply feature importance insights to refine existing predictive pipelines or explore alternative features for enhanced performance.    * Incorporate findings into real-time pricing recommendation tools to support hosts and operators. 4. **For Researchers:**    * Explore the impact of feature groups on price forecasting in different cities or seasons, expanding the study's applicability.    * Use this project as a foundation for studying other financial or real estate markets. |