Project Report: Singapore Resale Flat Price Estimator

1. Introduction

The Singapore Resale Flat Price Estimator is a machine learning application designed to predict the resale price of Housing Development Board (HDB) flats in Singapore. The application aims to provide accurate price estimates to help buyers and sellers make informed decisions. This report outlines the data analysis, model development, application development, and deployment process of the project.

2. Data Analysis

Data Sources

The dataset was obtained from the Singapore government's open data portal and includes historical transaction data for HDB flats. Key features include town, flat type, floor area, storey range, and transaction prices.

Data Preprocessing

Cleaning: Removed rows with missing or inconsistent values.
Transformation: Added new features such as `remaining_lease` and `current_remaining_lease`.
Exploratory Analysis: Conducted visualizations to understand the distribution of prices and relationships between features.

3. Model Development

Model Selection

Several regression models were evaluated, including Linear Regression, Decision Tree Regression, and Random Forest Regression. The Random Forest Regression model was chosen for its superior performance.

Feature Engineering

Converted categorical variables to numerical values.
Created new features to capture the impact of lease remaining and the number of years the flat has been held.

Model Training and Evaluation

The dataset was split into training and testing sets.
The Random Forest model was trained on the training set and evaluated on the testing set.
The model achieved an R-squared value of 0.85, indicating a strong predictive capability.

4. Application Development

The web application was built using Streamlit, providing a user-friendly interface for inputting data and obtaining price predictions. The application features:

- Home Tab: General information about Singapore and HDB flats.
- Application Tab: Input form for users to provide flat details and receive predictions.
- Summary Tab: Project summary and developer information.

5. Deployment

The application was deployed on the Render platform. The deployment steps included:
- Containerizing the application using Docker.
- Setting up a Render account and connecting the GitHub repository.
- Configuring build and runtime settings for deployment.

6. Conclusion

The Singapore Resale Flat Price Estimator effectively predicts HDB flat resale prices, providing valuable insights for potential buyers and sellers. The application is accessible online via Streamlit Cloud, offering a user-friendly interface for users to input flat details and receive accurate price predictions. Future improvements could involve incorporating additional features and exploring advanced machine learning models to further enhance prediction accuracy.

https://singalore-flat-resale-estimator-app.streamlit.app/

Developer Information

This application was developed by Akshaya Muralidharan. Akshaya is a dedicated professional transitioning into Data Science, proficient in Python, data preprocessing, and visualization, with hands-on experience in machine learning algorithms. Connect with Akshaya on LinkedIn: https://www.linkedin.com/in/akshayam08/.