Documentation and Instructions for Using the Resale Flat Price Predictor Application

Overview

The Resale Flat Price Predictor application is designed to predict the resale price of flats in Singapore based on various input features. This documentation provides a detailed guide on how to use the application effectively.

Accessing the Application

1. **Access Link**: You can access the application through the provided URL or by running it locally on your machine using Streamlit.
2. **Requirements**:
    - Ensure you have a stable internet connection if accessing the hosted version.
    - If running locally, make sure to have Python installed along with necessary libraries (`streamlit`, `pandas`, `scikit-learn`, `joblib`, etc.).

Navigation

- **Home Page**: Provides an overview of the project, its objectives, and instructions to navigate to the prediction page.
- **Prediction Page**: Allows users to input details of the flat to predict its resale price.

Steps to Use the Application

1. **Home Page**:
    - Upon accessing the application, you will land on the Home page.
    - Read through the project overview and click on the "Prediction" page link in the sidebar to proceed.
2. **Prediction Page**:
    - **Input Fields**:
        - **Town**: Select the town where the flat is located.
        - **Flat Type**: Choose the type of flat (e.g., 3-room, 4-room, etc.).
        - **Street Name**: Select the street name of the flat.
        - **Storey Range**: Choose the range of storeys the flat is on.
        - **Flat Model**: Select the model of the flat.
        - **Month**: Slide to choose the month of the transaction.
        - **Floor Area (sqm)**: Enter the floor area of the flat in square meters.
        - **Year of Transaction**: Enter the year when the transaction occurred.
        - **Lease Commence Year**: Enter the year when the lease commenced.
    - **Predict Price Button**:
        - After entering all the required details, click on the "Predict Price" button.

        - The application will compute and display the predicted resale price based on the input features.
3. **Viewing Results**:
    - Once the prediction is displayed, you can see the predicted resale price in SGD.
    - Explore different input combinations to see how different features affect the predicted price.

Tips for Using the Application

- **Accuracy**: While the model aims to predict resale prices accurately, actual prices may vary based on market conditions and other factors.
- **Feedback**: Your feedback is valuable! If you encounter any issues or have suggestions, please feel free to contact us.

Project Report Summary

Project Report: Resale Flat Price Prediction

Objective

The objective of this project was to develop a machine learning model that predicts the resale prices of flats in Singapore based on historical resale transaction data. The model was deployed as a user-friendly web application using Streamlit.

Methodology

1. **Data Collection and Preprocessing**:
    - Multiple datasets spanning different time periods (1990 to present) were collected from the Singapore Housing and Development Board (HDB).
    - Data preprocessing steps included handling missing values, feature engineering (e.g., extracting relevant features such as town, flat type, etc.), and transforming data into a suitable format for machine learning.
2. **Exploratory Data Analysis (EDA)**:
    - Conducted EDA to understand the distribution of resale prices, explore relationships between features and target variable, and identify outliers and skewed data.
    - Visualizations such as histograms, box plots, and correlation matrices were utilized to gain insights into the data.
3. **Model Development**:
    - Selected CatBoost Regressor as the final model due to its robust performance in predicting continuous target variables like resale prices.
    - Trained the model using features derived from the preprocessed data after encoding categorical variables and scaling numerical features.
4. **Model Evaluation**:

    - Evaluated the model using metrics such as Mean Squared Error (MSE), Mean Absolute Error (MAE), and R-squared score.
    - Conducted cross-validation to ensure the model's generalizability and robustness.
5. **Deployment**:
    - Deployed the model using Streamlit, a Python library for building web applications.
    - The web application allows users to input details about a flat and receive a predicted resale price based on the trained model.

Conclusion

The Resale Flat Price Prediction project successfully developed and deployed a machine learning model that predicts resale prices of flats in Singapore. The application provides a user-friendly interface for both potential buyers and sellers to estimate the resale value of flats accurately. Future enhancements may include incorporating real-time data updates and improving model accuracy based on ongoing market trends.