**🏠 Flat/House Price Prediction App**

**📌 Project Overview**

A Streamlit-powered machine learning web app that predicts residential flat or house prices. It uses a trained ensemble regressor and a simple UI to collect details and deliver real-time price estimates.

**🏗️ Core Components**

**1️⃣ User Interface**

* **Built with Streamlit** — includes a sidebar for navigation (Home, Predict, About).
* Clean forms for inputs: property type, sector, society, area, floor, number of rooms, balconies, and other features.
* Displays the prediction clearly with reverse log transformation.

**2️⃣ Model**

* **Backend:** trained ensemble model (e.g., Random Forest wrapped in a pipeline).
* Preprocessing:
  + StandardScaler for numerical features.
  + OrdinalEncoder for categorical features.
  + ColumnTransformer to handle both.
* Target (price in crore) is log-transformed during training for stability.

**3️⃣ Data**

* Sectors dynamically filter related societies.
* Inputs include numerical & categorical columns matching the training set.
* log\_area and bed\_bath\_ratio are derived.

**4️⃣ Prediction Logic**

* When the **Predict** button is clicked:
  + Input is processed with the same encoders & scalers.
  + Model predicts log price.
  + Output is inverse transformed to show the final estimate.

**⚠️ Disclaimer**

This app provides **approximate price predictions** only. Always consult real estate professionals for accurate valuations.

**⚙️ How to Run**

1. Clone or download the repository.
2. Place final\_df.csv and Model/flat\_price\_prediction.pkl correctly.
3. Install requirements:
4. pip install streamlit scikit-learn pandas numpy joblib
5. Run the app:
6. streamlit run app.py
7. Open the provided local URL to use the app.

**📂 Key Files**

| **File** | **Purpose** |
| --- | --- |
| app.py | Streamlit app with navigation & prediction logic |
| Model/flat\_price\_prediction.pkl | Trained model file |
| data/final\_df.csv | Data for mapping sectors & societies |
| requirements.txt | Python dependencies |

**🚀 Future Enhancements**

* Add user authentication
* Deploy online with Streamlit Cloud, Render, or Heroku
* Add data visualizations
* Export predictions as PDF or CSV
* Connect to live property listings

**👤 Contact**

**Developer:** Arshdeep Singh  
**Stack:** Python, Streamlit, Scikit-Learn, Pandas, NumPy, Joblib  
Feel free to connect for improvements or collaborations!