Real Estate Dashboard & Prediction System

Description

This project is an end-to-end dashboard system built with **React** (via **Vite**) for the frontend and **Quart** for the backend. It scrapes data from various websites, cleans and processes it, and stores it in a **Supabase** database. The frontend fetches the data via API calls and displays it using **Recharts.js**.

Contents

Installation:

1. Clone the Repository:

First, clone the repository to your local machine:

```
git clone https://github.com/your-username/real-estate-dashboard.git

cd real-estate-dashboard
```

Running the Backend:

A. Install Dependencies:

1. Navigate to the backend directory:

```
cd backend
```

2. Create and activate the virtual environment:

```
python -m venv .venv  # Create a virtual environment

.\.venv\Scripts\activate  # Activate the virtual environment (on Windows)
```

3. Install the required Python dependencies by using the requirements.txt:

```
pip install -r requirements.txt
```

B. Configure the Environment Variables:

In the backend folder, create a .env file and add your Supabase credentials. Replace the placeholders with your actual credentials.

```
SUPABASE_URL=your-supabase-url

SUPABASE_KEY=your-supabase-key
```

C. Running the Backend Server:

After activating the virtual environment and installing dependencies, start the backend server using Hypercorn (the ASGI server):

```
python -m hypercorn server:app
```

Running the Frontend:

A. Install Dependencies:

1. Navigate to the src directory (frontend):

   using npm:

```
cd frontend/src
```

2. Install the required dependencies using npm or yarn:

```
npm install
```

This will install all necessary dependencies as specified in the package.json file for the frontend.

B. Running the Frontend Server:

Once the dependencies are installed, start the frontend development server using npm:

```
npm run dev
```

The frontend will now be available at http://localhost:3000 (or the port specified in your .env file). Open this URL in your browser to see the real estate dashboard in action.

Folder Structure:

Here's a high-level overview of the folder structure:

real-estate-dashboard/

```
├── backend/              # Backend-related files
│   ├── .venv/            # Virtual environment folder (inside backend)
│   ├── server.py         # Backend entry point (Quart app)
│   ├── scraping/         # Web scraping logic
│   ├── sorting/          # Data sorting and cleaning logic
│   ├── .env              # Environment variables (Supabase URL & Key)
│   └── requirements.txt  # Python dependencies
├── src/                  # Frontend-related files (React + Vite)
│   ├── public/           # Public assets (index.html, etc.)
│   ├── src/              # React app source code
│   ├── components/       # Reusable React components
│   ├── App.jsx           # Main React app file
│   ├── .env              # Frontend environment variables
│   └── package.json      # Node.js dependencies
└── README.md             # Project documentation (this file)
```

Technologies Used:

1. Backend:

- **Quart**: A Python web framework for building asynchronous web apps. It is the core framework used for the backend server and API.

- **Python**: The backend is built using Python for its powerful web scraping, data processing, and API functionalities.

- **Supabase**: An open-source Firebase alternative that provides a backend-as-a-service solution. It is used for database management and authentication.

- **Requests**: A simple HTTP library used for web scraping to fetch data from external websites.

2. Machine Learning:

- LightGBM (LGBM): Gradient boosting framework for training models.

- XGBoost (XGB) : Extreme Gradient Boosting for price prediction.

- Scikit-Learn: Used for preprocessing, model evaluation, and feature engineering.

3. Frontend:

- **React**: A JavaScript library for building user interfaces, used to create the frontend of the dashboard.

- **Vite**: A build tool that provides a fast and optimized development environment for React apps.

- **Recharts**: A charting library for React used to display various visualizations such as graphs and data plots.

4. Development Tools:

- **Git**: A version control system used to manage the project's source code and collaboration.

5. Database:

- **Supabase Database**: A PostgreSQL database managed by Supabase, used to store and retrieve the data scraped and processed by the backend.

6. Other Tools:

- **npm/yarn**: Package managers used to install and manage frontend dependencies for the React app.

- **Python Virtual Environment**: Used for isolating and managing Python dependencies for the backend server.

License

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Contributors

We would like to thank the following contributors who have helped make this project possible:

- **Mostafa Dawi** – *Building Data Pipelines, Back-end and Front-end* – [GitHub Profile Link](#)

- **Amanda Makdessi** – *Data Scraping and Cleaning* – [GitHub Profile Link](#)

- **Yusuf Mazloum** – *Insights Extraction* – [GitHub Profile Link](#)

- **Mohammad Rahal** – *Data Scraping*

If you'd like to contribute to this project, feel free to fork the repository, make changes, and submit a pull request!

How to Contribute

1. Fork the repository.

2. Create a new branch (git checkout -b feature-name).

3. Commit your changes (git commit -am 'Add new feature').

4. Push to the branch (git push origin feature-name).

5. Open a pull request to the main repository.