Sustainable Smart City Assistant Using IBM Granite LLM

Project Overview

The Sustainable Smart City Assistant is an AI-powered platform that uses IBM Watsonx's Granite LLM and data tools to help with city planning, governance, and citizen engagement. It includes various features such as a city health dashboard, citizen feedback form, document summarization, eco-advice, anomaly detection, KPI forecasting, and a chat assistant. It uses FastAPI for the backend and Streamlit for the frontend interface.

Key Technologies Used

- IBM Watsonx Granite LLM: For summarization, chat, and report generation.
- Pinecone: A vector database for semantic search.
- Streamlit: Creates a simple and interactive user interface.
- FastAPI: Backend API routing and data processing.
- Pydantic and dotenv: Configuration management.
- Linear Regression: For predicting future KPIs.
- Supports integration with JSON, CSV, and text files.

Use Case Scenarios

- Policy Search & Summarization

Users can upload city policy documents and get simplified summaries using AI. This helps planners and citizens understand key information quickly.

- Citizen Feedback Reporting

Citizens can report city issues like water pipe leaks via a simple form. These are categorized and sent to the city team instantly.

- KPI Forecasting

Upload KPI data like water usage and the assistant uses machine learning to predict future trends, helping in

budget and planning.

- Eco Tips Generator

Users input words like 'plastic' or 'solar' and get tips on how to live more sustainably. Great for schools and public awareness.

- Anomaly Detection

By uploading energy usage data, the assistant finds unusual spikes, such as unauthorized power use, allowing quick action.

- Chat Assistant

Citizens can ask sustainability-related questions and get clear, AI-generated suggestions for improvement, like using solar panels or EVs.