Sustainable Smart City Assistant
Using IBM Granite LLM

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Project Overview

The Sustainable Smart City Assistant is an AI-powered tool that helps cities and citizens make eco-conscious decisions.

- Optimizes resources like energy, water, and waste.
- Provides personalized eco-tips.
- Summarizes government policies.
- Assists city officials with forecasting and planning.

Key Features

- Conversational AI Interface
- Policy Summarization
- Resource Forecasting
- Eco-Tip Generator
- Citizen Feedback Loop
- KPI Forecasting
- Anomaly Detection
- Multimodal Input Support

System Architecture

- **Frontend:** Gradio dashboard with eco tips & policy summarization.
- **Backend:** FastAPI for processing requests.
- **LLM Integration:** IBM Granite LLM for natural language understanding.
- **PDF Processing:** PyPDF2 for extracting policy text.
- **Vector DB:** Pinecone/FAISS for semantic search.

Tools & Technologies Used

- **Google Colab:** For development and GPU acceleration.
- **GitHub:** Version control and collaboration.
- **Hugging Face:** Hosting IBM Granite LLM.
- **Gradio:** Interactive UI framework.
- **PyPDF2:** PDF text extraction.
- **FastAPI:** REST API for backend services.

Setup & Running

Setup:
- Install Python 3.9+
- Install dependencies: transformers, torch, gradio, PyPDF2
- Configure environment variables.

Running:
1. Launch FastAPI backend.
2. Run Gradio frontend.
3. Upload policy documents or enter keywords.
4. Interact with the assistant.

Future Enhancements

- IoT integration for real-time city data.
- Advanced dashboards for city officials.
- Multilingual support for citizens.
- Mobile app deployment.
- Voice-enabled eco assistant.