Citizen AI – City Analysis and Citizen Services Assistant

Project Documentation

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1.1 Introduction

In today’ s world, smart cities need technology to help their residents. People want quick access to information about safety, accidents, and government services. Officials also need tools to process data easily.

The **Citizen AI** project is designed to solve this problem by providing real-time information through an AI assistant. It helps citizens with safety details and answers their questions about city services.

1.2 Project Objective

The main goals of this project are:

- Provide safety information like crime and accident data.
- Help citizens by answering questions about government services.
- Summarize government policies for easy understanding.
- Give users a simple interface to interact with AI.

1.3 Project Overview

Purpose:
The Citizen AI project aims to assist both citizens and city officials by giving instant responses, safety alerts, and helpful information through a user-friendly platform.

Key Features:

- Natural conversation interface using AI.
- City analysis with crime and accident statistics.
- Policy summarization for government rules.
- Query response for public service questions.
- Interactive dashboard with Gradio.

1.4 Technology Architecture

Frontend: Built using Gradio to create an easy-to-use interface.

Backend:

- Uses Python libraries like Transformers and PyTorch.
- Integrated with IBM’ s Granite model for text generation.

How it Works:

- Users ask questions or request information.
- The AI processes the query and gives responses.
- City analysis is shown with data and statistics.

Main Functions:

- generate_response(prompt) – Answers user questions.
- city_analysis(city_name) – Gives safety-related data.
- citizen_interaction(query) – Responds to queries on services.

1.5 Setup Instructions

Requirements:

- Python 3.8 or above
- Google Colab with T4 GPU (preferred)
- Libraries: transformers, torch, gradio

Steps to Setup:

1. Open Google Colab.
2. Set the runtime to GPU (T4 preferred).
3. Install necessary libraries using !pip install transformers torch gradio -q.
4. Paste the project code into the notebook.

5. Run all cells to launch the app.
6. Access the link provided to use the interface.

1.6 Folder Structure

app/ – Backend logic
app/api/ – API routes
ui/ – Frontend components
smart_dashboard.py – Main script
granite_llm.py – Model integration
document_embedder.py – Embedding and document search

1.7 Running the Application

1. Launch Google Colab.
2. Run the installation commands.
3. Start the Gradio dashboard.
4. Use the **City Analysis** tab to explore safety data.
5. Use the **Citizen Services** tab to ask questions.

1.8 API Documentation

Available Functions:

- **generate_response(prompt):** Generates replies based on user input.
- **city_analysis(city_name):** Provides crime and safety data.
- **citizen_interaction(query):** Answers service-related questions.

1.9 Authentication&Security

Future versions can include:

- Token-based authentication (JWT, API keys).
- OAuth2 integration.
- Role-based permissions for admins and users.

1.10 User Interface Description

- **City Analysis Tab:** Users enter a city name and view safety data.
- **Citizen Services Tab:** Users ask questions about services and receive answers.
- **Output:** Results are shown in clear text fields.

1.11 Testing Process

- **Unit Testing:** Test each function separately.
- **API Testing:** Check responses for sample inputs.
- **Manual Testing:** Validate features by using the interface.
- **Edge Cases:** Handle wrong city names or empty queries.

1.12 Known Issues

- Requires stable internet connection.
- AI results may not always be accurate.
- Works better with real-time data integration.

1.13 Future Enhancements

- Add real-time city data feeds.
- Improve AI with forecasting and analytics.
- Support multiple languages.
- Create a mobile application.

1.14 Conclusion

The **Citizen AI** project shows how artificial intelligence can make city services more accessible and safer. It helps both citizens and officials by providing quick and accurate information. This project is a step toward smarter cities in the future.