Sustainable Smart City Assistant Using IBM granite LLM

1.Introduction

Project Title: Sustainable Smart City Assistant Using IBM granite LLM

Team Member: Mohamed surath S **Team Member:** Shaik Mohamed Idris S **Team Member:** Tamilamudhan A

Team Member: Navinraj N **Team Member:** Ahmed M

- **2. Introduction Project Title:** SmartSDLC AI-Enchanted Software Development Lifecycle This project focuses on enhancing the traditional Software Development Lifecycle (SDLC) by integrating Artificial Intelligence (AI) to improve efficiency, accuracy, and automation across various phases of software engineering.
- **3. Project Overview Purpose:** The purpose of SmartSDLC is to optimize software development by automating repetitive tasks, predicting issues early, and supporting decision-making with AI-powered insights. This reduces cost, increases speed, and ensures higher software quality.

Features: • AI-based Requirement Analysis

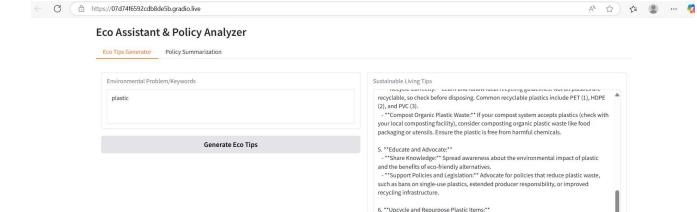
- Automated Code Generation & Review
- Bug Prediction & Anomaly Detection
- Test Case Automation & Optimization
- Project Progress Forecasting
- Documentation Summarization
- **4. Architecture Frontend (Streamlit/React):** Provides an interactive dashboard for requirement inputs, progress tracking, and report visualization. Backend (FastAPI/Django): Hosts APIs for AI-driven modules such as bug prediction, code review, and test automation. AI/ML Modules:
- NLP for Requirement Analysis
- ML Models for Bug Prediction

- Automated Code Review using LLMs
- Test Case Generation & Optimization Database: Stores project data, requirements, test cases, and logs.

Integration: Supports CI/CD tools like Jenkins, GitHub, and Docker for seamless development.

- **5. Setup Instructions Prerequisites:** Python 3.9+ pip and virtual environment tools API keys for AI/ML modules Access to GitHub/Jenkins for CI/CD integration Installation Process: 1. Clone the repository 2. Install dependencies from requirements.txt 3. Configure environment variables (.env file) 4. Run backend server 5. Launch frontend dashboard 6. Upload project data and start interacting
- **6. API Documentation Available APIs:** POST /analyze-requirements Extracts requirements from uploaded documents POST /generate-code Generates code snippets from specifications POST /predict-bugs Predicts bugs from codebase POST /generatetests Creates test cases automatically GET /project-forecast Provides progress insights and predictions
- **7. Testing Testing Phases:** Unit Testing For individual AI models and utility scripts Integration Testing For combined modules (code review + bug prediction) API Testing Using Postman & Swagger Manual Testing User interface and overall workflow Edge Cases Handling incomplete requirements, ambiguous inputs
- **8. Future Enhancements** AI-based Project Management Assistant Enhanced Natural Language Requirement Gathering Predictive Maintenance for Large Codebases Automated Deployment with AI-optimized CI/CD pipeline.

9.Screenshots



- **Turn Plastic into Art or Useful Objects:** Explore DIY projects that upcycle or repurpose plastic items, like creating jewelry, decorative pieces, or functional items (e.g., planters, storage containers). This reduces waste and adds creativity to your living space.

By implementing these practical and actionable eco-friendly tips, you can significantly reduce your plastic footprint and contribute to a more sustainable lifestyle.

