CAPSTONE PROJECT

ECO LIFESTYLE AGENT

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OUTLINE

- Problem Statement
- Proposed System
- System Development Approach
- Deployment & Host
- Result
- Conclusion
- GitHub link
- Future Scope
- IBM Certificates

PROBLEM STATEMENT

Problem Statement No.6 – *Eco Lifestyle Agent*

- In the face of escalating environmental challenges, there is a growing need to make sustainable living more accessible and actionable for individuals. Many people express interest in adopting eco-friendly habits but often lack clear, personalized guidance tailored to their daily routines or regional regulations. Information on sustainable practices, government schemes, or product alternatives is often fragmented across various platforms, making it difficult for users to make informed choices in real time.
- This problem underscores the importance of providing a unified, interactive platform that can assist users in making conscious, environmentally responsible decisions. From reducing household plastic consumption to understanding local recycling protocols or identifying green travel options, individuals require timely and relevant information delivered in an easy-to-understand format.
- The core challenge lies in enabling people to receive trustworthy, context-aware, and localized advice through intuitive interfaces. Addressing this need can significantly increase eco-awareness and facilitate widespread adoption of green habits that collectively contribute to environmental preservation and sustainability.

PROPOSED SOLUTION

- To address the growing demand for accessible and personalized eco-friendly living, the proposed solution is an AI-driven **Eco Lifestyle Agent** that utilizes **Retrieval-Augmented Generation (RAG)** powered by **Watsonx.ai** and **Watsonx.ai runtime** services. This intelligent assistant interacts with users through natural language queries and delivers precise, actionable responses.
- By leveraging a vector database populated with reliable data—ranging from sustainability tips to recycling guidelines and eco-product details—the system ensures that responses are contextually relevant and practically useful. The assistant promotes daily sustainable actions by making environmental knowledge both understandable and accessible.

SYSTEM APPROACH

The architecture of the Eco Lifestyle Agent includes several well-integrated components:

- **Data Source Aggregation**
  - Collect and curate data from environmental sources, government schemes, and eco-living portals.
  - Preprocess and structure data for embedding.
- **Embedding Generation and Storage**
  - Use embedding models (compatible with Watsonx) to convert documents into vectors.
  - Store embeddings in a vector database such as FAISS or IBM's vector storage service.
- **RAG Pipeline with Watsonx.ai**
  - Retriever: Fetches relevant context chunks using semantic similarity search.
  - Generator: Watsonx.ai LLM generates a final response using the retrieved content.
- **User Interface**
  - A web-based interface to allow natural language interaction.
  - Displays AI-generated eco guidance in a user-friendly format.
- **Cloud Hosting and Integration**
  - Use IBM Cloud Lite for hosting services.
  - Deploy the runtime using Watsonx.ai runtime service for scalability and performance.

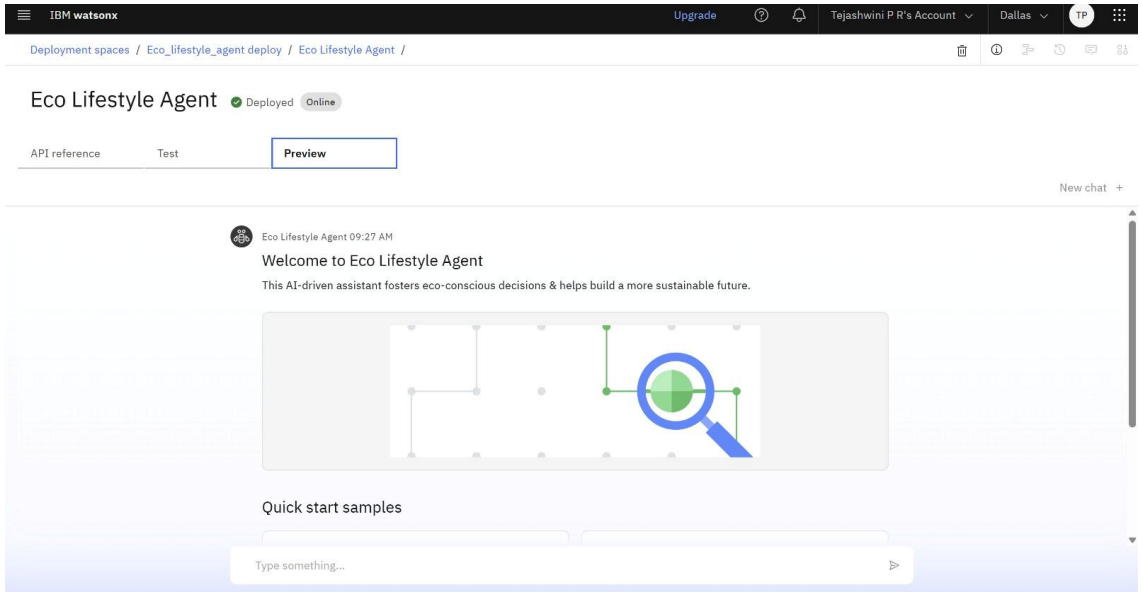
DEPLOYMENT

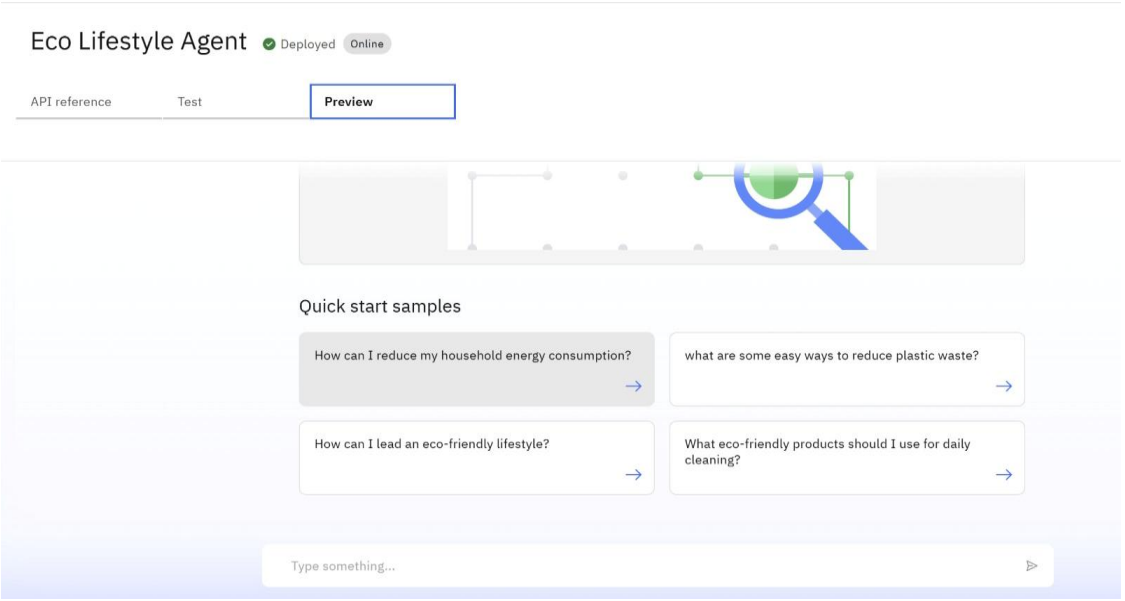
- Deployment is carried out on **IBM Cloud Lite** using the following tools and services:
- **Watsonx.ai** for LLM-based response generation
- **Watsonx.ai Runtime** for serving the RAG pipeline
- **Vector database** to support semantic retrieval

RESULT

- The Eco Lifestyle Agent effectively :
- Responds to diverse user queries with accurate, eco-conscious advice.
- Delivers localized information such as city-specific recycling rules.
- Provides suggestions in real-time with minimal latency.
- Demonstrates scalability and robustness using IBM Cloud infrastructure.

Eco lifestyle agent page:





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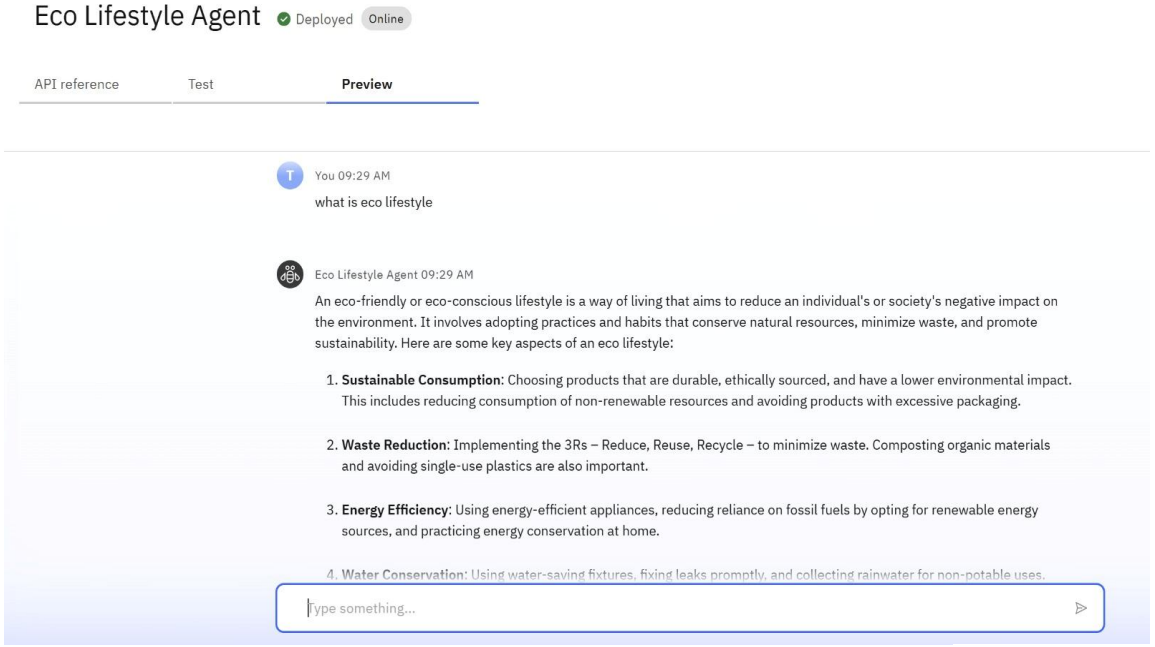
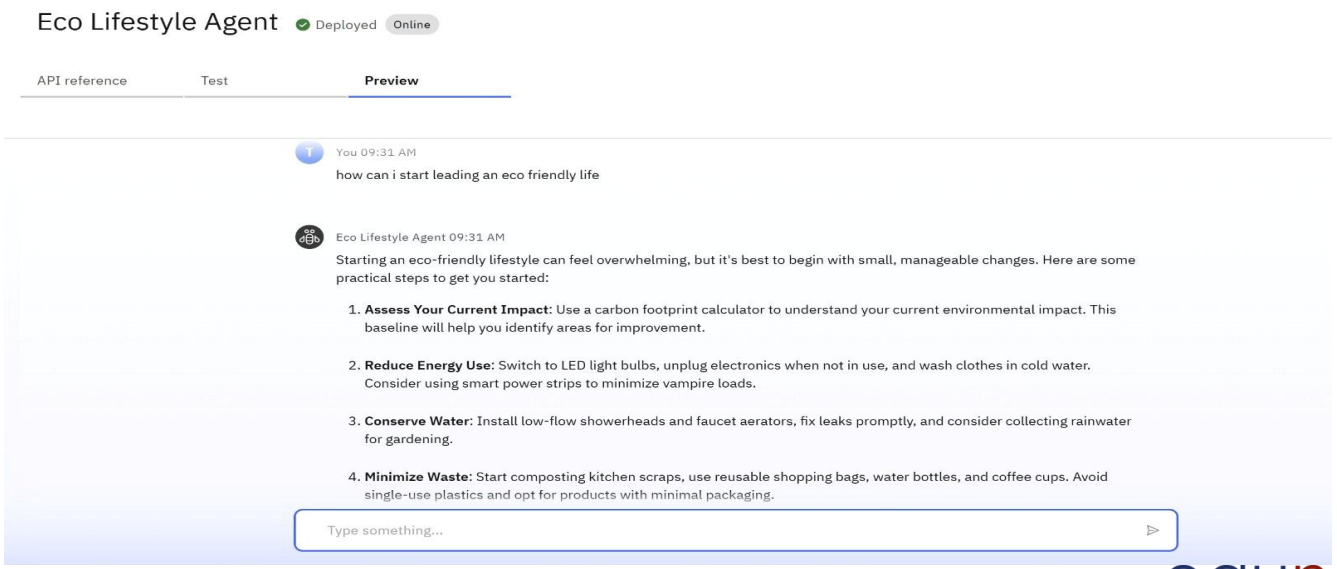


Example Interactions:

- What is eco lifestyle
- How can I start leading an eco friendly lifestyle



CONCLUSION

- The Eco Lifestyle Agent presents a forward-thinking solution to a pressing global issue—sustainable living. By combining RAG architecture with Watsonx.ai's advanced language capabilities and IBM Cloud services, this solution offers practical, real-time, and personalized eco advice to users. It lowers the barrier to sustainable choices and fosters an environmentally responsible mindset.

FUTURE SCOPE

- Potential future improvements include:
- **Multilingual Support**: Extend accessibility to non-English speakers.
- **Location-Based Personalization**: Auto-detect location for local tips.
- **Mobile App Development**: Create mobile-first solutions for wider reach.
- **IoT Integration**: Sync with smart home devices to optimize energy or waste use.
- **User Profiles**: Track progress and personalize recommendations.
- **Gamification**: Introduce rewards for eco-friendly behaviors.
- **Real-Time Updates**: Continuously update data from verified environmental sources.
- This AI-powered solution offers a scalable and impactful approach to environmental consciousness—paving the way toward a greener, more sustainable future.

GITHUB LINK

LINK : https://github.com/tejashwini707/IBM-CLOUD-PROJECT-eco-lifestyle-agent.git

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In recognition of the commitment to achieve professional excellence

Getting Started with Artificial Intelligence
IBM SkillsBuild
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IBM **SkillsBuild** Completion Certificate

This certificate is presented to

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(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 24 Jul 2025 (GMT) **Learning hours:** 20 mins

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THANK YOU

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