AI-Powered Chatbot for Bayard Vacations

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Solution Overview
This project implements an AI-powered chatbot designed to assist customers of Bayard Vacations by answering frequently asked travel-related questions such as destinations, travel packages, pricing, and booking processes. The solution focuses on providing a scalable, cost-efficient, and user-friendly conversational experience.

Technical Implementation
The chatbot is developed as a web-based application using Python and Flask for the backend and a lightweight HTML/CSS/JavaScript frontend for user interaction. Natural language understanding is achieved using an NLP-based sentence embedding approach. User queries are converted into vector representations using a pre-trained Sentence Transformer (MiniLM) model and matched against a predefined knowledge base using cosine similarity. The chatbot also maintains basic conversational context to handle follow-up queries effectively.

Architecture Summary
• Frontend: Web-based chat interface
• Backend: Flask REST API
• NLP Layer: Sentence embeddings for semantic intent matching
• Logic Layer: Context tracking and response selection

Business Value
• Improves customer experience with instant responses
• Reduces manual support workload
• Cost-efficient with no dependency on paid APIs
• Easily extensible for additional services
• Acts as a first-level customer support assistant

Key Features
• Understands natural language queries
• Supports follow-up questions
• Offline and reliable implementation
• Modular and scalable design

Limitations
• Limited to predefined knowledge base
• No real-time booking or pricing integration
• Session-based context handling

Conclusion
This chatbot demonstrates the effective use of NLP techniques to deliver an intelligent, business-oriented customer support solution suitable for real-world deployment with future scalability.