WellBot

Project Statement:

In an increasingly health-conscious world, individuals seek readily accessible and reliable information about general well-being, common ailments, and preventive health measures. However, a significant barrier often exists in the form of complex medical jargon and limited availability of multilingual resources. This project addresses this challenge by developing a privacy-conscious AI chatbot that provides clear, simplified explanations on health topics in multiple languages (English and Hindi). Its primary goal is to empower users with foundational health knowledge and first-aid guidance, while emphasizing that professional medical consultation is essential for diagnosis and treatment.

Milestone 3: Health Knowledge Base Expansion & Advanced Conversational Features

Module: Knowledge Base Expansion & Advanced Conversational Features

1. Expanded Health Knowledge Base

Purpose: Provide users with reliable, simplified, and bilingual health information, including common conditions, symptoms, preventive care, and first-aid guidance.

Files Used:
- **kb.json** – The main knowledge base file.

Contents:
- Condition name
- Symptoms (English + Hindi)
- Self-care tips (English + Hindi)
- When to seek a doctor (English + Hindi)
- Bilingual pre-written answers
- Source reference (WHO, CDC)
- Disclaimer

Example Interaction (Generalized):
- User reports fever → Bot retrieves entry from kb.json → Bot provides hydration, rest advice, and disclaimer. **References:**
- WHO Fact Sheets
- CDC Basic Health Guidelines

---

2. Advanced NLU & Entity Extraction

Purpose: Extract key entities from user queries, such as symptoms, body parts, and conditions,to ensure accurate and relevant KB lookup.

Files Used:
- **advanced_nlu.py** – Custom rule-based NLU engine.

Functionality:
- Detect symptom entities (fever, headache, nausea, cough)
- Recognize body parts (head, throat, chest)

- Identify wellness intent categories (diet, sleep, stress, fitness)
- Handle bilingual input (English/Hindi)

Example Interaction (Generalized):
- User mentions multiple symptoms → NLU identifies each symptom → Passes entities for KB lookup.

References:
- Hugging Face Transformers Models
- WHO / CDC Symptom Guidelines

---

3. Response Generation & Ethical Guardrails

Purpose:
Provide informative, non-diagnostic responses with disclaimers, ensuring user safety and ethical compliance.

Files Used:
- **app.py** – Main backend handling requests, KB lookup, and response generation.

Functionality:
- Extract entities using advanced_nlu.py
- Search kb.json for matching health conditions
- Return pre-written bilingual answer if found
- Fallback to intent-based response if no match
- Append friendly guidance + medical disclaimer

Example Interaction (Generalized):
- User asks about headache and fever → Bot provides hydration, rest, and first-aid tips → Includes disclaimer advising professional consultation.

References:
- WHO Fact Sheets
- CDC Basic Health Guidelines

---

4. Multilingual Expansion (Hindi Integration)

Purpose:
Enable Hindi-English bilingual conversation, allowing users to interact in their preferred language.

Files Used:
- **app.py** – Backend handles translation and response generation.

Optional Models:
- ai4bharat/indic-bert – Understand Hindi input
- Helsinki-NLP/opus-mt-en-hi (MarianMT) – Translate responses if fallback occurs

Example Interaction (Generalized):
- User inputs query in Hindi → Bot detects language → Retrieves KB entry or fallback response → Provides response fully in Hindi with guidance and disclaimer.

References:
- Hugging Face Transformers Models

---

5. System & Functionality Testing

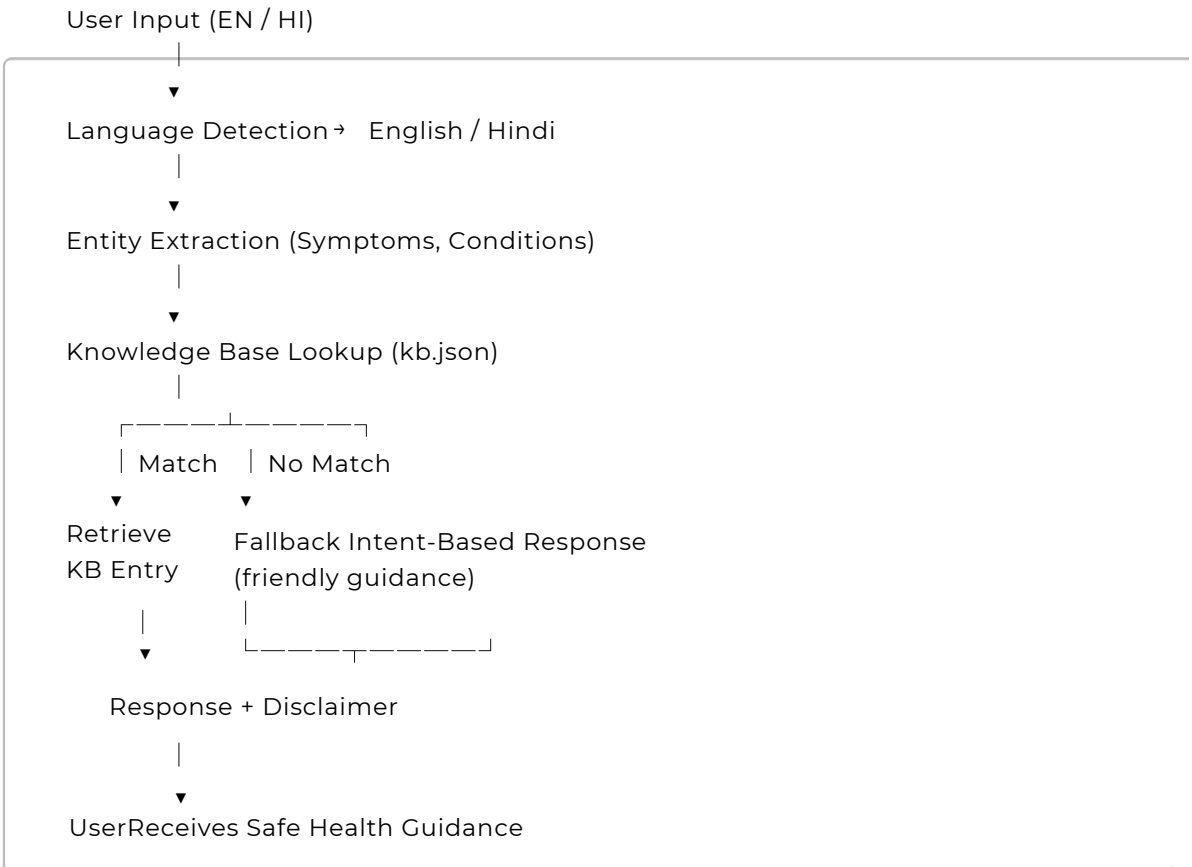
Purpose: Ensure reliable, safe, and multilingual interaction with the chatbot.

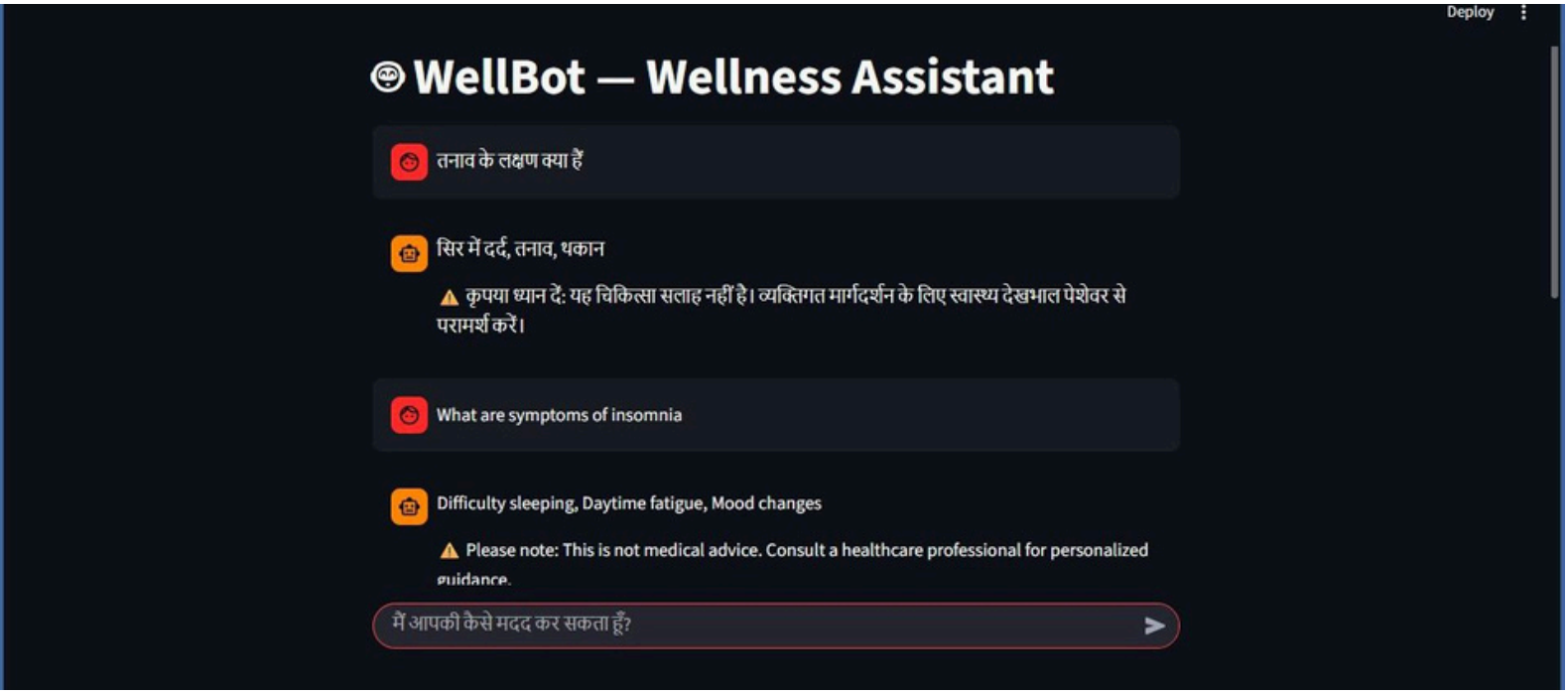
Tests Performed:
- KB lookup for known symptoms
- Intent detection for unmatched queries
- Bilingual input/output testing
- Ethical guardrails (disclaimer enforcement)
- Graceful error handling for failures

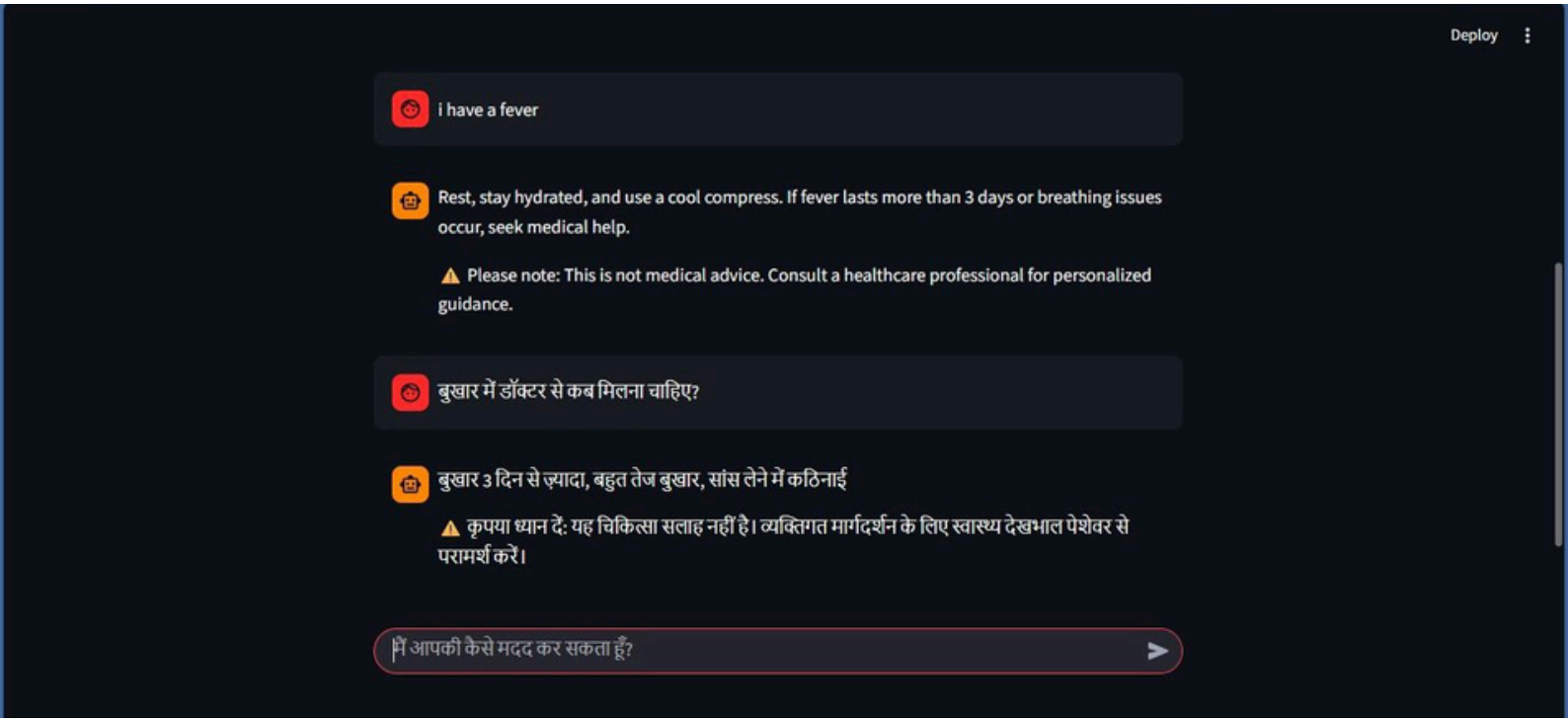
Example Interaction (Generalized):
- User queries multiple symptoms in English/Hindi → Bot responds safely Correctly handles both languages.

→ Includes disclaimers

Visual Diagram: Conceptual Flow




Deploy
WellBot — Wellness Assistant
तनाव के लक्षण क्या हैं
सिर में दर्द, तनाव, थकान
⚠ कृपया ध्यान दें: यह चिकित्सा सलाह नहीं है। व्यक्तिगत मार्गदर्शन के लिए स्वास्थ्य देखभाल पेशेवर से परामर्श करें।
What are symptoms of insomnia
Difficulty sleeping, Daytime fatigue, Mood changes
⚠ Please note: This is not medical advice. Consult a healthcare professional for personalized guidance.
मैं आपकी कैसे मदद कर सकता हूँ?


Deploy
i have a fever
Rest, stay hydrated, and use a cool compress. If fever lasts more than 3 days or breathing issues occur, seek medical help.
⚠ Please note: This is not medical advice. Consult a healthcare professional for personalized guidance.
बुखार में डॉक्टर से कब मिलना चाहिए?
बुखार 3 दिन से ज़्यादा, बहुत तेज बुखार, सांस लेने में कठिनाई
⚠ कृपया ध्यान दें: यह चिकित्सा सलाह नहीं है। व्यक्तिगत मार्गदर्शन के लिए स्वास्थ्य देखभाल पेशेवर से परामर्श करें।
मैं आपकी कैसे मदद कर सकता हूँ?

Results

- Comprehensive Health Chatbot: Successfully implemented a chatbot that provides reliable, evidence-based health information.
- Advanced NLU: Enhanced natural language understanding for accurate entity extraction and response generation.
- Ethical Guardrails: Incorporated strict ethical boundaries with clear disclaimers and non-diagnostic responses.
- Multilingual Support: Integrated Hindi language support, ensuring accessibility for a wider audience.
- User-Friendly Interface: Designed a smooth and intuitive UI for seamless digital health support.

References

1. World Health Organization (WHO) Fact Sheets: https://www.who.int/news-room/fact-sheets
2. Centers for Disease Control & Prevention (CDC) Basic Health Guidelines: https://www.cdc.gov
3. Hugging Face Transformers (MarianMT / Indic-BERT Models): https://huggingface.co/models