AI-Driven Public Health Chatbot for Disease Awareness (AI in Healthcare)

Problem Statement:

The proposed project aims to develop an **AI-powered multilingual healthcare chatbot** designed to educate and assist rural and semi-urban communities on preventive healthcare, disease awareness, vaccination schedules, and basic medical guidance. The system integrates with government health databases and uses AI for early disease detection and triage, ensuring healthcare accessibility even in low-connectivity environments.

The Problem:

Access to timely and accurate healthcare information remains a major challenge in rural and semi-urban India. Many individuals face barriers such as:

- Limited availability of doctors and healthcare infrastructure.
- Poor internet connectivity and low digital literacy.
- Lack of awareness about preventive measures, vaccinations, and symptoms of common diseases.
- Difficulty in booking appointments or finding nearby medical professionals.
- No reliable mechanism for quick diagnosis or treatment recommendations for minor injuries or ailments.

These gaps result in **delayed treatments**, **avoidable complications**, and **overburdened healthcare facilities**.

Idea Summary:

The proposed idea focuses on developing an AI-driven chatbot that bridges the healthcare gap in rural and semi-urban areas by providing accurate, real-time medical guidance. The chatbot will use multilingual support to communicate effectively with diverse users and offer guidance on preventive care, disease symptoms, and treatment recommendations. Users can also upload images (like injury photos) for AI-based analysis to suggest first-aid or connect with nearby doctors.

Proposed Solution:

We propose an **AI-driven, multilingual chatbot platform** that provides:

- **Disease awareness and preventive healthcare education** in local languages.
- **AI-based symptom analysis and triage** for common illnesses.
- **Integration with government health databases** for vaccination tracking and outbreak alerts.
- **Doctor-patient communication** via text, voice, or video (with low-bandwidth optimization).
- **Digital appointment booking** with local hospitals (private and government).
- **Medicine comparison tool** with verified descriptions and side effects.
- **Injury image upload** for basic AI-assisted first-aid recommendations.
- **Offline-first architecture** for uninterrupted service in low-network regions.
- **End-to-end encryption** and role-based access for data security.

Technical Architecture Overview :

The system follows a **microservices-based architecture** with five main layers: **Frontend, Backend, Database, AI Model (optional), and Security**.

- **Frontend:** Built using Thymeleaf, HTML5, CSS3, Bootstrap, and JavaScript. Uses AJAX/Fetch API for async communication and displays dynamic content and chatbot responses.
- **Backend:** Developed with Spring Boot, Spring MVC, and Spring Data JPA. Manages business logic, authentication (Spring Security), and provides REST APIs to the frontend and AI layer.
- **Database:** MySQL/PostgreSQL for relational data; MongoDB optional for unstructured data. Managed through JPA repositories for CRUD operations and optimized queries.
- **AI Model (Optional):** Python-based Flask/FastAPI microservice using OpenAI, TensorFlow, or PyTorch for chatbot or predictive analytics integrated via REST API.
- **Security:** Spring Security with JWT, BCrypt encryption, and HTTPS ensures secure authentication, role-based access, and encrypted data communication.

Team Name:

Team Name: BIO-BOTICS

Members:

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Conclusion:

The **AI-Driven Public Health Chatbot** bridges the healthcare gap between rural populations and modern digital healthcare. It leverages artificial intelligence, multilingual communication, and offline resilience to make healthcare **accessible, affordable, and reliable**. By combining technology with empathy, this project aligns with **India's Digital Health Mission** and has the potential to transform community health awareness and service delivery.