SYNOPSIS

TITLE :- Sanjeevani AI: Smart Health Companion for Accurate Diagnosis & Holistic Wellness

Problem Statement

In the digital age, people frequently turn to search engines and online symptom checkers to self-diagnose medical conditions based on their symptoms. However, these tools often provide scary, exaggerated, or misleading results—for example, a simple headache might be linked to brain tumors or cancer, causing unnecessary panic and anxiety. Additionally, many AI-driven healthcare platforms are either premium, subscription-based, or inaccessible to the general public, making them unaffordable for a large section of society.

Challenges with Existing Solutions

1. **Fear-Inducing Diagnoses:**
    - Most online medical tools focus on worst-case scenarios, often suggesting life-threatening conditions, leading to unnecessary stress and self-misdiagnosis.
    - Instead of guiding users in a calm and supportive manner, they create panic and health-related anxiety.
2. **Lack of Holistic Healthcare Advice:**
    - Existing solutions focus only on disease prediction without considering preventive and lifestyle-based approaches.
    - Ayurvedic wisdom, natural remedies, and lifestyle modifications—which play a crucial role in preventing and managing diseases—are often ignored.
3. **High Cost & Limited Accessibility:**
    - Many advanced AI-based healthcare tools require subscriptions or payments, making them inaccessible to the common people, especially in developing regions.
    - Free tools provide limited functionalities and may not be personalized to the user's health history.

4. **One-Size-Fits-All Approach:**
    - Many symptom checkers do not consider individual factors like age, weight, medical history (diabetes, hypertension, etc.), or lifestyle habits.
    - This leads to generic and inaccurate results that may not be relevant to the specific user.
5. **Lack of a Personalized & Conversational AI Assistant:**
    - Users often have follow-up questions like:
        - *"How can I manage my weight without losing strength?"*
        - *"What are the best Ayurvedic remedies for diabetes?"*
    - Existing tools lack interactive chat features that allow users to ask these queries in natural, human-like conversations.

Solution for the Problem statement

Sanjeevani AI represents a cutting-edge, AI-integrated healthcare assistant designed to provide accurate, non-alarmist disease predictions while incorporating Ayurvedic interventions and scientifically-backed lifestyle recommendations. By harnessing the capabilities of Machine Learning (ML), Natural Language Processing (NLP), and Generative AI (GenAI), this platform delivers a comprehensive, user-centric, and accessible healthcare experience. In contrast to conventional search engines that often present anxiety-inducing diagnostic results or premium software with restricted accessibility, Sanjeevani AI ensures inclusive, supportive, and evidence-based medical guidance to empower users in proactive health management.

Core Features of the Solution

1. **AI-Driven Disease Prediction with a Reassuring Approach**
    - Users input age, weight, height, medical history (including conditions such as diabetes and hypertension), sleep patterns, stress levels, and symptoms articulated in natural language.

- The AI model performs advanced symptom extraction and predicts probable diseases with a confidence score, maintaining a calm, rational, and informative approach rather than inducing panic.
- Unlike conventional diagnostic platforms that focus on worst-case scenarios, the system delivers balanced, contextualized health insights, enabling users to comprehend their conditions without distress.
- The AI model employs a continuous learning framework, integrating real-time user feedback and historical health data to enhance diagnostic precision over time.

2. **Holistic Health Management with Ayurvedic and Lifestyle-Based Interventions**
    - Each diagnosis is supplemented with personalized Ayurvedic remedies, sourced from verified and traditional medical knowledge bases.
    - The system formulates lifestyle recommendations based on dietary patterns, stress levels, and sleep cycles, ensuring a preventative and restorative approach to healthcare.
    - Ayurvedic treatment suggestions align with scientific validation, providing natural remedies that complement conventional medical advice.
    - The AI dynamically suggests habitual adjustments aimed at fostering long-term well-being and disease prevention, rather than merely addressing symptoms.
3. **Intelligent Conversational AI for Real-Time Health Assistance**
    - The integrated chatbot enables users to ask specific health-related queries, including disease management strategies, wellness guidance, and symptom clarification.
    - Utilizing context-aware NLP processing, the chatbot delivers tailored responses, ensuring user engagement and enhanced clarity.
    - Queries related to weight management, immune system enhancement, chronic disease prevention, and general wellness optimization are addressed with an adaptive, AI-driven approach.

- Unlike generic health chatbots, Sanjeevani AI incorporates longitudinal health tracking, adapting responses based on user history, lifestyle trends, and past interactions, thereby delivering an intelligent, evolving dialogue.

4. **Adaptive Learning Model for Continuous Improvement**
    - The AI system evolves through user interactions, self-reported symptoms, and feedback, ensuring progressive refinement in predictive accuracy.
    - Secure storage of longitudinal health data, with privacy-preserving encryption mechanisms, enables personalized future assessments and trend-based recommendations.
    - The model utilizes long-term data aggregation to identify patterns in health conditions, facilitating a predictive and preemptive healthcare approach.
    - The system remains dynamic and medically relevant through continuous updates and iterative machine learning improvements, leveraging large-scale anonymized datasets for enhanced medical decision-making.
5. **Open-Source, Free, and Universally Accessible Digital Healthcare**
    - Unlike proprietary healthcare platforms, Sanjeevani AI is entirely open-source and free of cost, fostering unrestricted access to AI-driven medical insights.
    - The platform eliminates economic barriers, making advanced digital healthcare tools available to individuals across socioeconomic backgrounds.
    - The open-source architecture encourages collaborative enhancements, research contributions, and algorithmic refinements, promoting a transparent and continuously improving health advisory system.
    - Developers, healthcare professionals, and data scientists can contribute by integrating expanded datasets, refining disease prediction models, and enriching Ayurvedic and lifestyle-based guidance to ensure an ever-evolving, evidence-backed healthcare assistant.

TECH STACK

Frontend:

- **HTML** – Structuring the web pages
- **Tailwind CSS** – Styling for a responsive and modern UI.

Backend:

- **Flask** – Lightweight web framework for handling API requests and backend logic
- **NLP & ML Models:**
    - **TensorFlow / PyTorch** – For training and running AI models
    - **Hugging Face Transformers** – For medical NLP-based chatbot and symptom recognition
    - **scikit-learn** – For classical ML algorithms in disease prediction

Database & Storage:

- **Supabase** – Open-source PostgreSQL-based database for:
    - Storing user health history, symptoms, and chat interactions
    - Managing authentication and real-time updates
- **Vector Database (Pinecone / FAISS)** – For chatbot memory and improved context awareness

Datasets:

- **Medical Symptom & Disease Datasets** (for model training)
    - **Disease-Symptom Relationship Data** – Collected from Kaggle, NIH, and WHO sources
    - **Ayurvedic Medicine & Treatment Data** – Curated from government research papers & Ayurvedic texts

- **User-generated Feedback Data** – Collected through real-world chatbot interactions
- **Sleep Patterns & Stress Level Data** – For more precise health recommendations

Other Integrations:

- **OpenAI API / LLaMA / BLOOM** – For chatbot and Generative AI-based recommendations
- **LangChain** – For advanced conversational AI with memory
- **API Integrations** – To fetch real-time medical research updates

TEAM MEMBERS

NAME	USN	SIGN
Basavaraj H G	3VY22CS014	
Samruddhi	3VY22CS044	
Meenakshi Jajee	3VY23CS402	
Shrinivas Nadager	3VY23CS406	

REFRENCE

1] S. Ambekar and R. Phalnikar, "Disease Risk Prediction by Using Convolutional Neural Network," 2018 Fourth International Conference on Computing Communication Control and Automation (ICCUBEA), Pune, India, 2018, pp. 1-5

doi: 10.1109/ICCUBEA.2018.8697423.

keywords: {Diseases;Heart;Prediction algorithms;Classification algorithms;Medical diagnostic imaging;Data mining;Feature extraction;Data Mining;Heart Disease Prediction;Naïve Bayes;KNN;Heart disease risk prediction;CNN-UDRP algorithm}

2] M. K, S. S and T. E, "Streamlit-Powered Comprehensive Health Analysis and Disease Prediction System," 2023 International Conference on Emerging Research in Computational Science (ICERCS), Coimbatore, India, 2023, pp. 1-7

doi: 10.1109/ICERCS57948.2023.10434221.

keywords: {Training;Support vector machines;Machine learning algorithms;Medical services;Prediction algorithms;Random forests;Diseases;Healthcare Prediction;Multiple Disease Prediction;Streamlit Platform;Machine Learning Algorithms}

3] R. Shanthakumari, C. Nalini, S. Vinothkumar, E. M. Roopadevi and B. Govindaraj, "Multi Disease Prediction System using Random Forest Algorithm in Healthcare System," 2022 International Mobile and Embedded Technology Conference (MECON), Noida, India, 2022, pp. 242-247

doi: 10.1109/MECON53876.2022.9752432.

keywords: {Scalability;Sociology;Pickling;Medical services;Predictive models;Prediction algorithms;Data models;Data preprocessing;Feature Selection;Multiple Diseases;Prediction model}

4] L. D. Gopisetti, S. K. L. Kummera, S. R. Pattamsetti, S. Kuna, N. Parsi and H. P. Kodali, "Multiple Disease Prediction System using Machine Learning and Streamlit," 2023 5th International Conference on Smart Systems and Inventive Technology (ICSSIT), Tirunelveli, India, 2023, pp. 923-931

doi: 10.1109/ICSSIT55814.2023.10060903.

keywords: {Heart;Support vector machine classification;User interfaces;Predictive models;Chronic kidney disease;Diabetes;Classification algorithms;Single user intetface;Diabetes;Heart disease;Chronic kidnev disease;Cancer;K Nearest Neighbor;Support Vector Machine;Decision Tree;Random Forel Logistic Regression;Gaussian naive bayes}

5] S. Zou and J. He, "Large Language Models in Healthcare: A Review," 2023 7th International Symposium on Computer Science and Intelligent Control (ISCSIC), Nanjing, China, 2023, pp. 141-145

doi: 10.1109/ISCSIC60498.2023.00038.

keywords: {Computational modeling;Training data;Medical services;Transforms;Predictive models;Data models;Trajectory;Large Language Models;ChatGPT;Applications in Healthcare}

6] V. Aashish Sekar, J. Dwijavanthi and V. Vijayalakshmi, "Performance Analysis of Machine Learning Algorithms for Thyroid Disease," 2024 15th International Conference on Computing Communication and Networking Technologies (ICCCNT), Kamand, India, 2024, pp. 1-6

doi: 10.1109/ICCCNT61001.2024.10723840.

keywords: {Machine learning algorithms;Accuracy;Computational modeling;Predictive models;Prediction algorithms;Classification algorithms;Bayes methods;Reliability;Thyroid;Diseases;Thyroid disease;Machine Learning;Support Vector Machine;Decision Tree;Random Forest;Naive Bayes;K-Nearest Neighbor;XGBoost;ANN}