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Healthcare Chatbot System

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ABSTRACT: Normally Users are not aware about all the treatment or symptoms regarding the particular disease. For small problem user have/, to go personally to the hospital for check-up which is more time consuming. Also handling the telephonic calls for the complaints is quite hectic. Such a problem can be solved by using medical ChatBot by giving proper guidance regarding healthy living. The medical chat-bots functioning depends on Natural language processing that helps users to submit their problem about the health. The User can ask any personal query related to health care through the chat-Bot without physically available to the hospital. By Using Google API for voice-text and text-voice conversion. Query is sent to ChatBot and gets related answer and display answer on android app. The System's major concern behind developing this web based platform is analysing customer's sentiments.

I. INTRODUCTION

Healthcare is essential for leading a good life, but getting a doctor's consultation can be challenging. This project aims to create an AI-powered medical chatbot that provides basic details about diseases before consulting a doctor. By reducing healthcare costs and improving access to medical knowledge, the chatbot serves as a valuable medical reference. It engages patients in conversations about their symptoms and offers personalized diagnoses, giving them insight into their health and protection. Utilizing artificial intelligence, the chatbot mimics human thinking and behavior, offering a conversational experience that helps users understand their health conditions better.

II. OBJECTIVES

- **Enhancing User Interaction:** To improve user experience by leveraging BERT's natural language processing capabilities to understand user queries accurately, including context, nuances, and intent.
- **Comprehensive Understanding:** To enable the chatbots to grasp the entirety of user inquiries bidirectionally, ensuring a comprehensive understanding of complex medical language and nuances.
- **Effective Symptom Analysis:** To develop algorithms capable of effectively analysing symptoms provided by users, leading to accurate assessments and recommendations.
- **Providing Relevant Information**: To offer users relevant and timely health-related information based on their queries and needs.
- **Preliminary Recommendations:** To provide preliminary recommendations or guidance to users based on the information provided, aiding in decision-making regarding their health concerns.
- **Handling Various Health-Related Concerns:** To ensure that the chatbots can address a wide range of health-related inquiries adeptly, catering to diverse user needs and concerns.
- **Deep Understanding of Medical Terminology:** To incorporate BERT's capability to understand medical jargon and contextual dependencies, enriching the chatbot's knowledge base and improving accuracy in responses.can you generate correctly and uderstand me in simple

III. LITERATURE SURVEY

[1] "Humicare-a Chatbot For Healthcare System" Authors : Dr. V Sheeja Kumari, Beksy S George
[2] "Artificial Intelligence Chatbot For Healthcare and Medical Science" Authors : Rajnish Pandey, Lucky Pareek
[3] "Healthcare Chatbot System For Aged and Physically Challenged People" Authors : Ms. Anisha M Jain, Mr. Nitin George Thomas
[4] "Recipes for Building an Open-Domain Chatbot" Authors : Stephen Roller, Jason Weston, Mary Williamson, Eric M. Smith
[5] "Section A-Research paper Personal Healthcare Chatbot for Medical Suggestions Using Artificial Intelligence and Machine Learning Eur" Authors : Dava Srinivas, Umapathi Nagappan, Jegadeesan Ramalingam

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[6] "Leveraging LLM: Implementing an Advanced AI Chatbot for Healthcare Authors : Ajinkya Mhatre, Sandeep R. Warhade, Omkar Pawa, Sayali Kokate
[7] "Chatbots Utility in Healthcare Industry: An Umbrella Review" Authors : Amir Masoud Afsahi, Seyedahmad Seyedalinaghi
[8] "Representing Rule-based Chatbots with Transformers" Authors : Dan Friedman Abhishek Panigrahi Danqi Chen
[9] "Few-Shot Bot: Prompt-Based Learning for Dialogue Systems" Authors : Andrea Madotto, Zhaojiang Lin, Genta Indra Winata, Pascale Fung
[10] "BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding" Authors : Jacob Devlin Ming-Wei Chang Kenton Lee Kristina Toutanova

IV. METHODOLOGY

The project's methodology encompasses the following key steps:

- BERT (Bidirectional Encoder Representations from Transformers) is a pre-trained transformer model designed to understand the context of words in a sentence by considering both the left and right context.
- This bidirectional approach enables BERT to grasp nuances and meanings more effectively than previous unidirectional models.

1.Context Understanding
BERT understands context by considering both left and right words in a sentence.
Example:
Input: "I have a pain in my chest."

2. Pre-training
BERT is pre-trained on large text corpora to learn general language patterns.
Example:
Corpus: Wikipedia articles, books, etc.
Task: Predicting missing words in sentences

3. Fine-tuning
BERT is fine-tuned on a domain-specific dataset to adapt to healthcare-specific vocabulary and context.
Example:
Dataset: Collection of medical queries and responses.
Task: Training BERT to respond to questions like "What are the symptoms of flu?"

4. Tokenization
BERT breaks down input text into subwords, which helps in handling specialized medical terms.
Example:
Input: "cardiovascular"
Tokens: ["cardio", "##vascular"]

5. Embedding
Input text is converted into embeddings, which are numerical representations capturing the semantic meaning.
Example:
Input: "I have a headache."
Embedding: A numerical vector representing this sentence.

6. Transformer Architecture
BERT processes embeddings through multiple transformer layers to produce contextualized representations.
Example:
Layers: Each layer uses self-attention to weigh the importance of each word in the context.
Output: Contextualized embeddings for each word.

7. Output Layer
The fine-tuned BERT model generates appropriate responses to user queries.
Example:
Query: "What should I do if I have a fever?"

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BERT Output: "You should drink plenty of fluids, rest, and consider taking over-the-counter medications like acetaminophen."

V. TOOLS AND TECHNOLOGIES REQUIRED

Hardware

- Processor : Intel i3 2 .4GHz
- Hard Disk : 40GB
- Ram : 8 GB or above

Software

- Operating system : Windows 7 and above
- Front End : (HTML5, CSS3, JavaScript)
- Coding Language : Python
- Database : MSSql Server 2014
- IDE : Visual Studio 2015

VI. CONCLUSION

By reviewing the literature we come to know that this system giving the accurate result. As we are using large dataset which will ensures the better performance compared as earlier. Thus we build up a system which is useful for medical institute or hospitals to help the users to freely ask medical dosage related queries by voice and text. System gets output for medicine API and speak out and display all medicine names. We are using NLP because we want to a computer to communicate with users in their terms. So by using bert algorithm and disease symptoms system can predict disease. User can get related answer displayed and refer this answer for analysis

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