PREDICTIVE ANALYTICS

LAB PROJECT

Topic - Medical Chatbot

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Submitted to:

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Heading Outlines

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Introduction

In today's fast-paced world, access to timely and reliable healthcare information has become a necessity. However, several barriers still exist in the healthcare system, such as long waiting times, geographical inaccessibility, and the unavailability of healthcare professionals in rural or underserved areas. These challenges emphasize the need for innovative solutions that can bridge the gap between patients and medical services.

Artificial intelligence (AI) and natural language processing (NLP) have revolutionized various industries, including healthcare. One significant application of AI in this domain is the development of medical chatbots.This project not only aims to enhance healthcare accessibility but also ensures user-friendly and secure interactions. With a commitment to innovation and efficiency, the medical chatbot strives to improve healthcare delivery and empower users with critical health-related knowledge at their fingertips.

KEY FEATURES:

1. Symptom Checker
2. Medication Information
3. Personalized Health Tips

Problem Statement

Limited Healthcare Accessibility

- Lack of healthcare professionals and facilities in rural and underserved areas.
- Long waiting times for appointments and consultations.

Reliance on Unreliable Information

- Patients often turn to inaccurate online sources for self-diagnosis.
- Misinformation leads to improper treatment or delayed medical attention.

Inefficient Current Solutions

- Helplines and static FAQs fail to offer personalized or real-time responses.
- Healthcare apps often lack usability and comprehensive features.

High Consultation Costs

- Financial constraints prevent many users from accessing professional medical advice.

Literature Review

Existing Medical Chatbot Systems :

- **Babylon Health**: Known for its AI-based symptom checker, it provides users with possible diagnoses and advice.
- **Ada Health**: Focuses on detailed symptom assessment, combining a user-friendly interface with AI-driven insights.
- **Florence**: Acts as a medication reminder and provides basic health tips.

Research Gaps :

- The ability to handle complex medical scenarios.
- Adaptive learning systems for evolving medical knowledge.
- Incorporation of advanced AI techniques for improved natural language understanding.

SWOT Analysis

a) Strengths (S) :

- Provides 24/7 assistance and reduces healthcare professional workload.
- Offers instant and scalable solutions.
- Improves accessibility, especially in rural areas.

b) Weaknesses (W) :

- Limited understanding of complex medical scenarios.
- Dependency on accurate, extensive training data.
- Requires regular updates to maintain relevance.

c) Opportunities (O) :

- Integration with wearable devices for real-time health monitoring.
- Expansion into mental health support
- Collaboration with healthcare institutions.

d) Threats (T) :

- Ethical concerns regarding data security and misuse.
- Risk of user dependency on chatbot for serious medical conditions.
- Competition from established medical apps.

Objective

User-Centric Assistance

Provide instant, reliable, and user-friendly medical assistance.

Symptom Analysis

Accurately interpret symptoms and suggest possible conditions.

Integration with Medical Systems

Link with EHRs for personalized recommendations and follow-ups.

Data Security and Privacy

Ensure compliance with regulations like HIPAA and GDPR.

Platform Accessibility

Make the chatbot available on web, mobile, and popular messaging platforms.

Continuous Improvement

Use feedback and AI training to refine accuracy and usability.

Healthcare Professional Collaboration

Validate medical advice and integrate escalation paths

Methodology

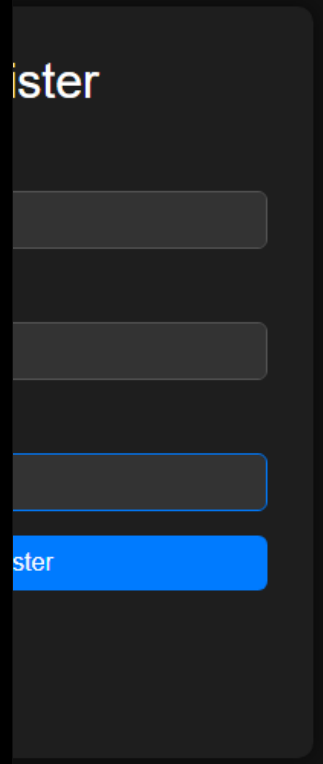
1. **Data Collection:**
   - Gather medical datasets (e.g., symptom-disease mappings, FAQs from trusted medical sources).
   - Use publicly available healthcare APIs for dynamic data access.
2. **AI Model Development:**
   - Use pre-trained models like GPT or natural language understanding.
   - Fine-tune the model with medical datasets for domain-specific accuracy.
4. **Backend and Integration:**
   - Develop the backend using Python for API management.
   - Integrate the chatbot with frontend platforms.
5. **Testing and Validation:**
   - Perform rigorous testing with test cases simulating diverse medical queries.
   - Validate responses with medical professionals to ensure accuracy.
6. **Deployment:**
   - Deploy the chatbot on platforms like AWS.
   - Make it accessible via web, mobile, or messaging platforms like WhatsApp.
7. **Evaluation and Feedback:**
   - Collect user feedback and analyze logs to improve accuracy and usability.

Methodology

Timeline:

Week 1-3: Requirement Analysis
Week 4-6: Design
Week 7-12: Implementation
Week 13-14: Testing
Week 15: Deployment

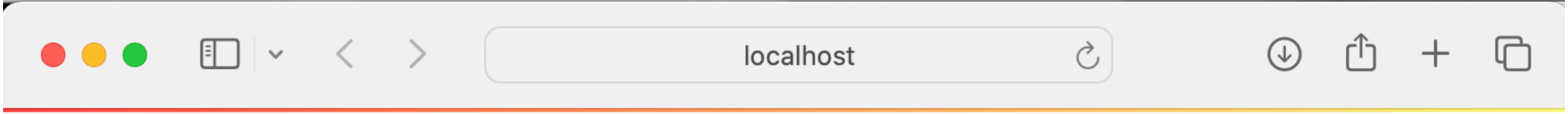
Overview of the Chatbot



```
0.977222036545689
for svm:
1.0
----------------------------------HealthCare ChatBot----------------------------------

Your Name?                                ->yashi
Hello,  yashi

Enter the symptom you are experiencing                  ->fever
searches related to input:
0 ) high_fever
1 ) mild_fever
Select the one you meant (0 - 1):  1
Okay. From how many days ? : 2
Are you experiencing any
joint_pain ? : yes
vomiting ? : yes
yellowish_skin ? : no
dark_urine ? : no
nausea ? : no
loss_of_appetite ? : no
abdominal_pain ? : no
diarrhoea ? : no
mild_fever ? : yes
yellowing_of_eyes ? : no
muscle_pain ? : no
/Users/yashi/Documents/GitHub/healthcare-chatbot/venv/lib/python3.9/site-packages/sklearn/base.py:493: UserWar
ning: X does not have valid feature names, but DecisionTreeClassifier was fitted with feature names
  warnings.warn(
It might not be that bad but you should take precautions.
You may have  hepatitis A
2024-12-04 12:19:15.508 Python[17706:1429168] NSSpeechSynthesizer: [NSSpeechSynthesizer setVoice:] - Voice ide
ntifier not found.
```



RUNNING... Stop Deploy

You may have hepatitis A.

Hepatitis A is a highly contagious liver infection caused by the hepatitis A virus. The virus is one of several types of hepatitis viruses that cause inflammation and affect your liver's ability to function.

Enter your symptom:

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Thank You