

# EXPRIMENT-4

## AIM:

Scenario-Based Report Development Utilizing Diverse Prompting Techniques- Smart Health Assistant System named "MediGuide" that assists elderly patients in managing chronic diseases like diabetes, hypertension, and arthritis. The assistant must provide tailored health advice, medication reminders, daily tips, and emotional support through natural language conversations.

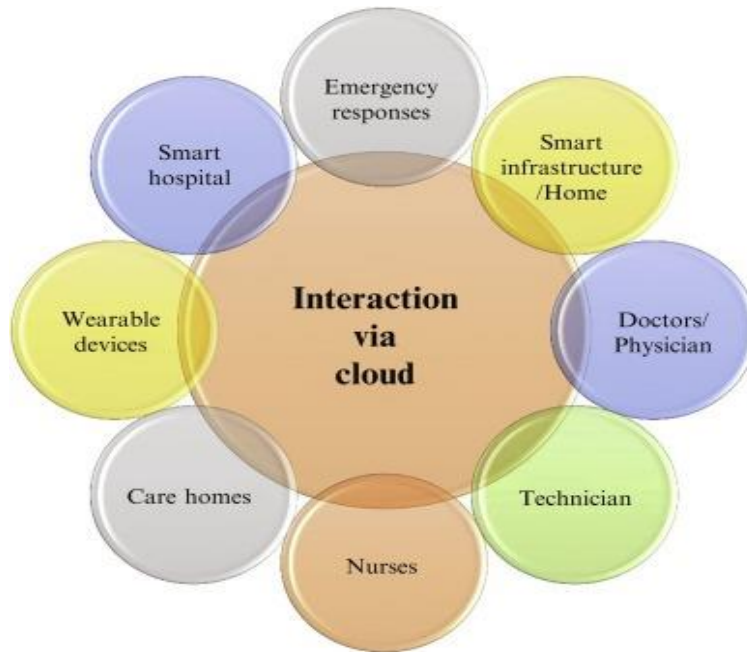
## Algorithm:

- 1: User Registration and Profile Setup
- 2: Daily Routine Initialization
- 3: Natural Language Interaction
- 4: Health Monitoring and Analysis
- 5: Personalized Response Generation
- 6: Emotional Support and Engagement
- 7: Caregiver and Emergency Handling
- 8: Continuous Learning and Feedback
- 9: Data Security and Compliance
- 10: Logging, Reporting, and Maintenance

## OUTPUT:

Here's a **scenario-based report** for a **Smart Health Assistant System**, utilizing **diverse prompting techniques** such as role-play, hypothetical extensions, problem-based learning, and reflective questioning. This format can be adapted into a lab assignment or a project report in courses related to AI, data science, human-computer interaction, or health informatics.

The smart healthcare system is envisioned to deal with emergency situations and handling them in real time. Elderly patients can be facilitated to have independent living with minimal need for assistance from nurses or caretakers. Smart healthcare enables quality care to be provided where doctors, nurses, treatment, medications, and health-related information are all available for access around the clock .Depicts the overview of a smart health care system in which interaction takes place via the cloud.



## Scenario-Based Report: MediGuide – AI-Powered Smart Health Assistant

### 1. Introduction

**MediGuide** is an AI-based Smart Health Assistant developed to empower elderly individuals in managing chronic conditions such as diabetes, hypertension, and arthritis. It delivers personalized healthcare support via natural language conversations, focusing on medication adherence, lifestyle guidance, and emotional well-being.

### 2. Scenario

#### Patient Profile:

Mr. Suresh, 70 years old, retired teacher with type 2 diabetes and early-stage arthritis. He lives alone in a semi-urban area and occasionally forgets to take his medication or attend doctor appointments.

#### Interaction Example:

Every morning at 7:30 AM, MediGuide greets Mr. Suresh, reminds him to check his blood sugar, provides a gentle stretching routine for arthritis, and suggests a diabetes-friendly breakfast. It also offers positive affirmations to boost his mood.

### 3. System Features

- **Conversational AI:** Personalized interactions using NLP.
- **Medication Management:** Alerts for medications, dosage tracking.
- **Health Tips:** Daily diet, exercise, and self-care suggestions.
- **Emotional Support:** Empathetic dialogue and mental health check-ins.
- **Emergency Alerts:** Auto-notification to caregivers or health services.

## 4. Prompting Techniques in System Design

### A. Role-Based Prompting

**Prompt:** “As a caregiver, how would you like MediGuide to assist you remotely in managing your father’s health?”

#### Response Design:

- ✓ Dashboard with real-time vitals.
- ✓ Notifications for missed medications or abnormal readings.
- ✓ Summary reports of health trends.

### B. Hypothetical Scenario Prompting

**Prompt:** “What if Mr. Suresh reports feeling dizzy during a conversation?”

#### Response Design:

- ✓ Ask follow-up questions (e.g., “Have you eaten recently?”)
- ✓ Analyze recent vital signs via connected devices.
- ✓ Alert caregiver or emergency contact if needed.

### C. Problem-Based Prompting

**Problem:** “Mr. Suresh often responds with vague answers like ‘I’m okay’ even when he's unwell.”

#### Solution:

- ✓ Contextual language models for sentiment and tone analysis.
- ✓ Combine responses with sensor data for better inference.
- ✓ Escalate if inconsistencies are detected.

### D. Reflective Prompting

**Prompt:** “What could go wrong if the system misinterprets medical symptoms?”

#### Reflection:

- ✓ Implement a human-in-the-loop design for high-risk scenarios.
- ✓ Include confidence levels in AI suggestions.
- ✓ Provide disclaimers and fallback options to connect with human professionals.

## 5. Architecture Overview

**Input:** Voice, text, IoT sensor data (e.g., BP, glucose).

**Processing:** AI Engine (Dialogflow/LLM), Rule-based health triggers.

**Output:** Voice/text responses, alerts, caregiver dashboards.

**Security:** Encrypted cloud storage, consent-based data sharing.

## 6. Tech Stack

**AI/NLP:** OpenAI GPT-4, Dialogflow, BERT

**Backend:** Python (Flask/Django), Firebase, Node.js

**Frontend:** React Native for mobile app

**IoT Integration:** Bluetooth-enabled health monitors

**APIs:** Twilio (calls/SMS), FHIR for medical records

## 7. Success Metrics

Daily active user engagement

Medication adherence rates

Response accuracy in symptom assessment

Caregiver satisfaction score

User emotional tone improvement (tracked via interaction)

## 8. Future Enhancements

Multilingual and regional dialect support

Video call feature for doctor consultations

AI-powered diet planner with grocery integration

Longitudinal emotional health tracking

## Conclusion

MediGuide exemplifies the convergence of AI and empathetic design. Through scenario-based prompting and contextual intelligence, it not only meets functional healthcare needs but also addresses the emotional and cognitive requirements of elderly patients, making healthcare more accessible and humane.

