

EXP 4 Scenario-Based Report Development Utilizing Diverse Prompting Techniques

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AIM:

To demonstrate how different prompting techniques can be used to improve the performance and contextual relevance of an AI-based health assistant system—MediGuide—in providing support for elderly patients with chronic diseases.

Description:

Background:

You are part of a development team working on an AI-based Smart Health Assistant named "MediGuide". This virtual assistant is designed to help elderly patients manage chronic conditions such as diabetes, hypertension, and arthritis. MediGuide's capabilities include:

- 1.Providing personalized health advice
- 2.Sending medication reminders
- 3.Sharing daily wellness tips
- 4.Offering emotional support through conversational AI

To improve MediGuide's effectiveness, we explore how diverse prompting techniques can enhance its interactions.

Objective:

Develop a scenario-based report that demonstrates how diverse prompting techniques (zero-shot, few-shot, chain-of-thought, role-based, and multi-modal prompts) can be used to optimize MediGuide's responses in different use cases.

Algorithm:

1. Identify Use Cases:

1. Daily health advice for arthritis patients
2. Blood pressure monitoring for hypertension
3. Emotional support during diabetes management

2. Define Prompting Techniques:

1. Zero-shot Prompting: Direct question without examples
2. Few-shot Prompting: Input includes sample interactions
3. Chain-of-Thought Prompting: Encourage reasoning steps
4. Role-based Prompting: Assign AI a specific role (e.g., virtual nurse)
5. Multi-modal Prompting: Combine text with input images (e.g., food logs)

3. Create Scenario-Based Prompts:

Frame prompts tailored to each use case and method.

4. Collect Responses:

Submit the prompts to the AI and record the responses.

5. Evaluate Output:

Assess based on relevance, accuracy, empathy, and personalization.

output

Use Case 1: Arthritis - Daily Advice

Zero-shot Prompt:

"What advice can you give to someone with arthritis today?"

Output: Generic exercise and diet tips.

Few-shot Prompt:

"Yesterday you advised light stretching. Today, what should I do for arthritis pain?"

Output: Personalized follow-up including gentle yoga and hydration tips.

Role-based Prompt:

"As a virtual physiotherapist, suggest an arthritis-safe morning routine."

Output: Detailed routine with warm-up, stretching, and breathing practices.

Use Case 2: Hypertension - Monitoring and Alerts

Chain-of-Thought Prompt:

"My BP reading is 150/95. Should I be worried? Explain step-by-step."

Output: Breaks down normal BP ranges, explains risks, and suggests contacting a doctor.

Few-shot Prompt:

"Last week my BP was 130/85. Today it is 150/95. What does this mean?"

Output: Tracks trends, explains fluctuations, and suggests dietary checks.

Use Case 3: Diabetes - Emotional Support

Role-based Prompt:

"As a supportive companion, help me stay positive despite my sugar levels."

Output: Encouraging words, stress reduction tips, and motivational quotes.

Multi-modal Prompt:

(Includes image of sugar readings from glucose monitor)

Output: Analysis of trends from the image + calming voice-based tips (if supported).

Conclusion:

Using advanced prompting techniques can make AI health assistants like MediGuide more interactive, emotionally intelligent, and clinically useful. Such strategies can greatly enhance user trust and satisfaction, especially for elderly patients managing chronic diseases. Continued exploration of prompt engineering is essential for creating truly smart healthcare solutions.

Result

The experiment successfully demonstrated how diverse prompting strategies significantly influence the relevance, personalization, and empathetic tone of MediGuide's responses