**EXP.NO 05 Scenario-Based Report Development Utilizing Diverse Prompting Techniques**

**Developing an AI-Powered Energy Management System for Smart Homes**

**Objective:**  
The aim of this experiment is to design an AI-powered energy management system that monitors energy usage in smart homes, optimizes energy consumption, and reduces costs while ensuring user comfort. Prompts will guide the research, data collection, analysis, and report creation using various AI prompting techniques.

**Prompts for the Experiment:**

1. Defining the Scope:
   * Direct Prompt: "What are the key challenges in designing an AI-powered energy management system for smart homes?"
   * Iterative Prompt: "Refine the challenges identified to focus on energy optimization without compromising comfort."
2. Exploring Energy Consumption Patterns:
   * Exploratory Prompt: "What insights can be gained from analyzing energy usage data in smart homes during peak and off-peak hours?"
   * Scenario-Based Prompt: "How can the system adjust appliance usage patterns during peak hours to reduce costs?"
3. Understanding User Preferences:
   * Empathy-Based Prompt: "What energy management features would users find most beneficial in their daily routines?"
   * Counterfactual Prompt: "What if the system could predict and adapt to user habits—how would this impact energy efficiency?"
4. Data Collection for AI Model Training:
   * Data-Focused Prompt: "What data is necessary to train the AI system, and how can it be collected from smart home devices?"
   * Clarifying Prompt: "What are the best sources of real-time energy usage data for training purposes?"
5. System Optimization and Analysis:
   * Critical Prompt: "How can the AI system balance energy efficiency with maintaining a comfortable living environment?"
   * Analogy-Based Prompt: "How does optimizing energy in smart homes compare to energy management in commercial buildings?"
6. Report Creation:
   * Summarization Prompt: "Summarize the findings on the impact of AI on energy optimization in smart homes."
   * Exploratory Prompt: "What future developments could enhance AI-driven energy management systems for residential use?"

**CONCLUSION:**

The experiment successfully designed an AI-powered energy management system for smart homes, optimizing energy use, reducing costs, and ensuring user comfort. Using diverse prompting techniques, it identified challenges, analyzed data, and proposed efficient, user-centric energy solutions