EX-02-Cross-Platform-Prompting-Evaluating-Diverse-Techniques-in-AI-Powered-Text-Summarization

1. Objective

The purpose of this experiment is to test how different AI models handle vague, unstructured prompts versus well-defined, refined prompts across multiple scenarios. The study aims to assess the quality, accuracy, and depth of responses.

2. Methodology

The experiment follows these steps:

1. **Selecting AI Models:** Various AI models (e.g., GPT-3.5, GPT-4, BERT, T5) are chosen for comparison.
2. **Defining Prompt Types:**
    - **Unstructured Prompts:** Broad and ambiguous.
    - **Refined Prompts:** Clear and specific.
3. **Testing Across Scenarios:**
    - Technical Explanation
    - Creative Writing
    - Troubleshooting
    - Decision-Making Analysis
4. **Evaluating Responses:** Responses are measured based on:
    - **Quality:** Coherence and relevance.
    - **Accuracy:** Correctness of the information.
    - **Depth:** Level of detail provided.

3. Results and Observations

Scenario 1: Technical Explanation

- **Unstructured Prompt:** "Tell me about AI."
    - **GPT-3.5:** "AI is a technology that mimics human intelligence."
    - **GPT-4:** "AI allows machines to perform tasks that typically require human intelligence."
- **Refined Prompt:** "What is the difference between supervised and unsupervised learning?"

    - **GPT-3.5:** “Supervised learning uses labeled data, whereas unsupervised learning identifies patterns in unlabeled data.”
    - **GPT-4:** “Supervised learning relies on pre-labeled datasets to make predictions, while unsupervised learning discovers hidden patterns without predefined labels.”

Analysis:

- **Quality:** Basic responses were more structured and informative.
- **Accuracy:** Unstructured responses were vague, whereas refined responses were precise.
- **Depth:** Refined responses provided more meaningful insights.

Scenario 2: Creative Writing

- **Unstructured Prompt:** “Write a story.”
    - **GPT-3.5:** “Once upon a time, there was a robot.”
    - **GPT-4:** “A robot embarked on an adventure.”
- **Refined Prompt:** “Write a story about a robot that discovers emotions.”
    - **GPT-3.5:** “A robot named R1-4 found a memory chip filled with human experiences, leading it to understand joy and sorrow.”
    - **GPT-4:** “R1-4, a highly efficient machine, encountered a diary that evoked emotions it was never programmed to feel, setting it on a journey of self-discovery.”

Analysis:

- **Quality:** Unstructured responses lacked creativity, while refined responses were engaging.
- **Accuracy:** Unstructured responses were generic; refined responses were well-developed.
- **Depth:** Refined responses included emotional and narrative depth.

Scenario 3: Troubleshooting

- **Unstructured Prompt:** “Fix my computer.”
    - **GPT-3.5:** “Try restarting it.”
    - **GPT-4:** “Check if it’s plugged in and restart.”
- **Refined Prompt:** “How do I troubleshoot a computer that won’t boot?”
    - **GPT-3.5:** “Ensure the power cable is connected, try booting in safe mode, and check for hardware failures.”

    - **GPT-4:** “Verify the power source, unplug external devices, access BIOS settings, and run diagnostics to check for faulty hardware.”

Analysis:

- **Quality:** Refined responses were more detailed and useful.
- **Accuracy:** Unstructured responses were too generic; refined responses were actionable.
- **Depth:** Refined responses covered multiple troubleshooting steps.

Scenario 4: Decision-Making Analysis

- **Unstructured Prompt:** “What should I do?”
    - **GPT-3.5:** “Think about your options.”
    - **GPT-4:** “Make a list of pros and cons.”
- **Refined Prompt:** “What factors should I consider before buying an electric car?”
    - **GPT-3.5:** “Evaluate costs, charging infrastructure, battery life, and incentives.”
    - **GPT-4:** “Consider daily commute, total cost of ownership, charging availability, environmental impact, government rebates, and long-term savings.”

Analysis:

- **Quality:** Unstructured responses were too generic; refined responses were well-thought-out.
- **Accuracy:** Unstructured responses lacked key considerations; refined responses provided detailed factors.
- **Depth:** Refined responses covered multiple relevant aspects.

4. Key Findings

- **Prompt Design Matters:** Specific prompts significantly improve response quality.
- **Model Performance:** GPT-4 consistently outperformed GPT-3.5 in depth and nuance.
- **User Guidance:** Well-structured prompts enhance user engagement and understanding.
- **Practical Applications:** Thoughtful prompt engineering improves AI usability in real-world scenarios.

5. Conclusion

This study demonstrates that the clarity of prompts dramatically impacts AI responses. Well-defined prompts lead to more accurate, detailed, and useful outputs, reinforcing the importance of structured query formulation for optimizing AI performance.

Output/Result: A comparative analysis highlighting the importance of prompt refinement for improving AI-generated responses.