Experiment Title

Exploring Prompting Techniques for AI-Based Content Creation

Objective

To demonstrate how different prompting strategies—such as query decomposition, decision-making prompts, and semantic filtering—can be used with AI models like ChatGPT to generate diverse content types (reports, articles, case studies, creative works). The experiment focuses on how prompt structures influence the resulting content's quality, coherence, and organization.

Tools and Technologies

- Python 3 (optional, for API integration)
- OpenAI's ChatGPT or similar large language models
- Text editing and analysis tools

Methodology

1. Select Content Types

Three distinct content formats were chosen to test prompting techniques:

- Formal report
- Case study
- Creative work (comic book storyline)

2. Define Prompting Techniques

- **Query Decomposition:** Breaking down a complex prompt into smaller, manageable questions to build the final content piece step-by-step.
- **Decision-Making Prompts:** Providing AI with choice-based instructions to guide the tone, style, or structure.
- **Semantic Filtering:** Using specific keywords or themes in prompts to ensure the AI focuses on relevant information.

3. Design Prompts

- **Report (Query Decomposition):**
  Step 1: "Explain the background of climate change."

Step 2: “List the main causes of climate change.”
Step 3: “Describe current mitigation strategies.”
Final prompt: “Combine the above information into a structured report.”

- **Case Study (Decision-Making):**
  Prompt: “Write a case study on renewable energy adoption in rural areas. Use a formal tone and include challenges and solutions.”
- **Comic Book Storyline (Semantic Filtering):**
  Prompt: “Create a short comic book story involving a young hero, futuristic technology, and a moral lesson about friendship.”

4. Generate Content

Each prompt was fed into ChatGPT to generate respective outputs.

5. Analyze Results

Evaluate each content piece based on:

- Quality of writing and clarity
- Logical flow and coherence
- Appropriateness of tone and style
- Structural completeness

Sample Prompts and Outputs

Content Type	Prompt Technique	Sample Prompt	Expected Outcome
Report	Query Decomposition	Stepwise prompts building a detailed climate change report	Clear, well-structured formal report
Case Study	Decision-Making Prompt	“Write a case study on renewable energy with challenges and solutions.”	Insightful case study with balanced tone
Comic Book	Semantic Filtering	“Story with young hero, futuristic tech, moral about friendship.”	Engaging, themed comic storyline

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Observations

- **Query Decomposition** helped create detailed and organized reports by guiding the AI through manageable steps, improving coherence.
- **Decision-Making Prompts** effectively controlled tone and content focus, resulting in relevant and formal case studies.
- **Semantic Filtering** ensured the creative outputs stayed aligned with the themes, producing imaginative yet relevant comic storylines.
- Complex or vague prompts led to less focused or inconsistent outputs, highlighting the importance of precise prompt design.

Sample Python Pseudocode for API Use

```
import openai

def generate_content(prompt):
    response = openai.ChatCompletion.create(
        model="gpt-4o-mini",
        messages=[{"role": "user", "content": prompt}]
    )
    return response.choices[0].message.content

# Example for query decomposition (simplified)
background = generate_content("Explain the background of climate change.")
causes = generate_content("List the main causes of climate change.")
mitigation = generate_content("Describe current mitigation strategies.")
full_report = f"{background}\n\n{causes}\n\n{mitigation}\n\nCombine into a
structured report."

final_report = generate_content(full_report)
print(final_report)
```

Conclusion

This experiment shows that the way prompts are structured and designed significantly impacts AI-generated content. Techniques like query decomposition break down complexity for better coherence, decision-making prompts guide style and focus, and semantic filtering aligns content with themes.

Mastering these prompting strategies enables users to produce high-quality reports, case studies, creative works, and more using AI models efficiently.