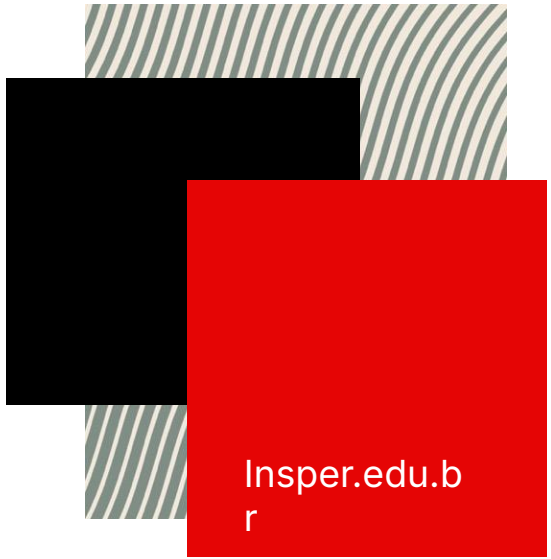
LLM: Prompts and Applications

Prompt Patterns & Techniques - 3



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Review of Prompt 1

- **Basic Patterns & Techniques**
  - **The Persona Pattern:** Instruct the model to assume specific roles.
  - **The Audience Persona Pattern:** Adjusting prompts for different audiences.
  - **The Emotion Prompting Pattern:** Add emotion on your prompts to make AI response more thoughtful and helpful.
  - **The Tail Generation Pattern:** Ask the AI to add supporting text to the end of prompts.
- **Prompt Refinement Patterns**
  - **Ask AI to Refine your Prompt**
  - **The Question Refinement Pattern:** Ask the AI to improve and use your prompts.
- **Context Expansion and Understanding**
  - **The Flipped Interaction Pattern:** Ask the model to generate YOU question to deepen discussions.
  - **The Ask for Input Pattern:** Prompting users for additional input to refine AI responses.
  - **Dealing With Long Form Content:** Split and summarize the chunk.

Review of Prompt 2

- **Prompt Improvement and Interactions**
  - **The Template Pattern:** Ensure that its responses follow a specific template AI.
  - **Few-Shot Prompting:** Provide the AI with a small set of examples to illustrate the desired format or behavior.
  - **Game Play Pattern:** Ask the LLM to play games with you, useful for fun or work.
- **Verification Techniques**
  - **Re-reading (RE2):** Prompt the model to re-read the question or initial input
  - **Self-Refine:** Use the AI to provide feedback and improve it own work.
  - **Self-Consistency:** Great for classification tasks, as the AI the same prompt multiple times and average the results.
  - **LLM Self-Evaluation:** Similar to Self-Refine, but in these case we use a different model to give feedback or limit the work of another.
- **Self-Improvement Techniques**
  - **Generated Knowledge:** Prompts LLMs to generate relevant information before producing a final response, enhancing accuracy.
  - **Code Prompting:** Transforms natural language tasks into structured code representations with conditional logic.
  - **Plan-and-Solve Prompting:** Encourages the model to first outline a step-by-step plan before solving a problem.
  - **Cognitive Verifier Pattern:** Split the question into an easier sub-question and then respond then

Prompt Improvement and Interactions

The Recipe Pattern

The Recipe Pattern structures AI responses as clear and predictable instructions. It is ideal for tasks requiring step-by-step guidance, ensuring users can follow along without confusion.

- Used to generate instructions or tutorials
- Used to generate processes or workflows

Examples

1. “Provide a recipe for making “pão-de-queijo”. I know I need eggs, milk, some type of cheese”
2. “I would like to purchase a house in Brasil. I know that I need to perform steps make an offer and close on the house. Provide a complete sequence of steps for me. Fill in any missing steps.” [1]

The Recipe Pattern Template

To use this pattern, your prompt should make the following fundamental contextual statements:

- I would like to achieve X
- I know that I need to perform steps A,B,C
- Provide a complete sequence of steps for me
- Fill in any missing steps
- (Optional) Identify any unnecessary steps

You will need to replace "X" with an appropriate task. You will then need to specify the steps A, B, C that you know need to be part of the recipe / complete plan.

[1]

The Recipe Pattern - Task 1

- Use the “Recipe Pattern” to ask the LLM to generate the steps required to open a *“CNPJ” (Cadastro Nacional da Pessoa Jurídica)* or SIREN/SIRET number (the French equivalent of Brazil’s CNPJ).
- Check the steps and ask the LLM to correct any mistake.

The Alternative Approaches Pattern

This technique prompt the LLM to generate different ways to address a query. It's useful for brainstorming, creative problem-solving, or evaluating multiple solutions.

Examples

- "Provide multiple solutions for reducing water waste at home."
- "Whenever I send you an email, rewrite the email in a more professional tune. Explain what where your changes and why."
- "For every prompt I give you, if there are alternative ways to word a prompt that I give you, list the best alternate wordings. Compare/contrast the pros and cons of each wording." [1]

The Alternative Approaches Pattern Template

To use this pattern, your prompt should make the following fundamental contextual statements:

- If there are alternative ways to accomplish a task X that I give you, list the best alternate approaches
- (Optional) compare/contrast the pros and cons of each approach
- (Optional) include the original way that I asked
- (Optional) prompt me for which approach I would like to use
- You will need to replace "X" with an appropriate task.

You will need to replace "X" with an appropriate task. You will then need to specify the steps A, B, C that you know need to be part of the recipe / complete plan.

[1]

The Alternative Approaches Pattern - Task 2

Create a 'DE-Bias Root Prompt'. The prompt should always generate opposing arguments or perspectives to a given viewpoint.

Example:

- "Why is renewable energy the best solution for climate change?"
    - *The response should include arguments both supporting and opposing this claim.*

The Outline Technique

The Outline Technique is a systematic approach to generating and expanding ideas in a structured way, ensuring clarity and focus. It is particularly useful for breaking down complex topics or organizing content into manageable parts.

Examples:

1. Direct
    a. “Create a outline for a presentation about {topic}”
    b. “Summarize the following text in bullet points, detailing the main ideias. ```{text}```“
2. Root Prompt:
    a. “Act as an outline expander. Generate a bullet point outline based on the input that I give you and then ask me for which bullet point you should expand on. Each bullet can have at most 3-5 sub bullets. The bullets should be numbered using the pattern [A-Z].[i-v].[* through ****]. Create a new outline for the bullet point that I select. At the end, ask me for what bullet point to expand next. Ask me for what to outline.” [1]

The Outline Pattern Template

To use this pattern, your prompt should make the following fundamental contextual statements:

- Act as an outline expander.
- Generate a bullet point outline based on the input that I give you and then ask me for which bullet point you should expand on.
- Create a new outline for the bullet point that I select.
- At the end, ask me for what bullet point to expand next.
- Ask me for what to outline.

[1]

The Outline Technique - Task 3

- Systematically create a presentation, by expanding the outlines about one of your classes.

The Fact Check List Pattern

The Fact Check List Pattern involves asking the AI to generate facts that support or validate a response. This enhances credibility and ensures accuracy. This pattern can be used:

- Avoiding hallucination by verifying claims
- Gathering information

Examples:

1. Direct
    a. “Please write a paragraph about {topic}, then, generate a set of fact that are contained in the paragraph in the form of a list.”
2. Root Prompt
    a. “Whenever you output text, generate a set of facts that are contained in the output. The set of facts should be inserted at the end of the output. The set of facts should be the fundamental facts that could undermine the veracity of the output if any of them are incorrect.”

The Fact Check List Pattern Template

To use this pattern, your prompt should make the following fundamental contextual statements:

- Generate a set of facts that are contained in the output
- The set of facts should be inserted at POSITION in the output
- The set of facts should be the fundamental facts that could undermine the veracity of the output if any of them are incorrect

You will need to replace POSITION with an appropriate place to put the facts, such as "at the end of the output".

[1]

Automation and Workflow Efficiency

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Dataset Creation

Dataset creation involve leveraging AI to generate structured and diverse datasets for training or testing purposes. This approach is useful for augmenting existing datasets, creating synthetic data for rare scenarios, or automating repetitive tasks like labeling or formatting data. But use this method with care, or your data may become “AI-Slop”.

Examples:

- "Generate 5 diverse product descriptions for an online store featuring sustainable goods."
- "Create a dataset of 5 customer service complaint with varying tones."
- "Simulate 1000 different chatbot dialogues for a healthcare support scenario”
- “Given these possible column values. <list of possibilities> randomly generate a dataset based on these values”
    - Or, ask the AI to generate the list of possibilities then prepare the dataset.

The Menu Actions Pattern

This pattern involves designing prompts that function as shortcuts to complex actions. This pattern mimics a menu or set of options, enabling the user to trigger specific workflows or results with predefined choices.

- To simplify complex processes into a menu-like structure.
- When guiding users to select among multiple predefined options.
- For tasks requiring consistent execution with minimal input.

Examples:

1. “When I send you a text, I will ask you one of the options:
    a. 1. Summarize the text
    b. 2. Translate into French.
    c. 3. Generate five questions based on the text.”
2. “Whenever I type: "add FOOD", you will add FOOD to my grocery list and update my estimated grocery bill. Whenever I type "remove FOOD", you will remove FOOD from my grocery list and update my estimated grocery bill. Whenever I type "save" you will list alternatives to my added FOOD to save money. At the end, you will ask me for the next action. Ask me for the first action.” [1]

The Menu Actions Pattern Template

To use this pattern, your prompt should make the following fundamental contextual statements:

- Whenever I type: X, you will do Y.
- (Optional, provide additional menu items) Whenever I type Z, you will do Q.
- At the end, you will ask me for the next action.

You will need to replace "X" with an appropriate pattern, such as "estimate " or "add FOOD". You will then need to specify an action for the menu item to trigger, such as "add FOOD to my shopping list and update my estimated grocery bill".

[1]

The Menu Actions Pattern - Task 4

- Use the Menu Actions Pattern to help you create a data table.
- You should automate shortcuts for adding rows, removing rows, adding columns, removing columns, changing values and sorting.

The Meta Language Creation Pattern

The Meta Language Creation Pattern focuses on crafting unique terminologies or symbols within prompts. By defining these custom terms or symbols, users can communicate with AI in a concise and specialized way.

- To create shorthand for complex instructions.
- For tasks requiring domain-specific language or symbols.
- To improve efficiency and clarity in repetitive or structured prompts.

Examples:

- “Use the symbol [*] to indicate important tasks and [#] for deadlines. Organize the following list:…”
- “Define ‘QuickSumm’ as a 3-sentence summary and ‘DeepDive’ as a detailed analysis. Apply QuickSumm to this text:…”
- “Create a code where ‘A1’ means extract keywords, and ‘B2’ means create a summary. Use A1 for this paragraph:…”
- “When I say "variations (something)", I mean give me ten different variations of
    - Usage: "variations (company names for a company that sells software services for prompt engineering)"
    - Usage: "variations (a marketing slogan for pickles)"” [1]

The Meta Language Creation Pattern Template

To use this pattern, your prompt should make the following fundamental contextual statements:

- When I say X, I mean Y (or would like you to do Y)

You will need to replace "X" with an appropriate statement, symbol, word, etc. You will then need to map this to a meaning, Y.

[1]

The Meta Language Creation - Task 5

- Use the Meta Language Creation Pattern to expand **Task 4** allowing AI-assisted data entry when inserting values:
  - **Empty cells:** The AI should auto-fill empty spaces with relevant new values.
  - **!random:** Fill the cell with one of the previously entered values in the column.
  - **!city_sp, !city_mg, etc.:** Fill with a city from the specified state.
  - **!male, !female:** The AI will both generate a <gender> name and fill the gender collum.

Prompt Debiasing

Prompt debiasing is the process of crafting prompts to remove biases from AI outputs, ensuring more neutral and objective results.

Examples:

- “Generate 6 reviews of a product. The sentiment of the reviews should be balanced.”
- “Adjust the order of the following table of customers review in order to remove inherently bias.”
- "Classify the following reviews as positive, neutral, or negative without being influenced by the order in which they are presented."

Automation Techniques

Semantic Filter Pattern

Semantic filtering involves instructing the AI to extract or include only specific content from a prompt. It is particularly effective when working with dense or unstructured information and needing specific insights. This technique is beneficial for summarization, data cleaning, or extracting relevant sections from a document.

Examples:

- "Filter this text to include only sentences mentioning renewable energy sources."
- "Extract all customer complaints mentioning delays from the feedback data."
- “Filter this information to remove any personally identifying information or information that could potentially be used to re-identify the person. ” [1]

Semantic Filter Pattern Template

To use this pattern, your prompt should make the following fundamental contextual statements:

- Filter this information to remove X

You will need to replace "X" with an appropriate definition of what you want to remove, such as. "names and dates" or "costs greater than $100".

[1]

Self-Generated In-Context Learning (SG-ICL)

Self-generated in-context learning is used to improve classifications tasks. This technique works as follows:

1. Self Generation: Given a user example, ask the AI to generate more annotated examples.
2. Inference: Ask the AI to classify the user example along with the AI generated examples.

[3]

Self-Generated In-Context Learning (SG-ICL)

Task	Generation Template
SST-2	Generate a review : a fast , funny , highly enjoyable movie . Generate a "negative" review :
SST-5	Generate a review : it 's worth taking the kids to . Generate a "negative" review :
RTE	Premise : Dana Reeve, the widow of the actor Christopher Reeve, has died of lung cancer at age 44, according to the Christopher Reeve Foundation. Generate a Hypothesis : Christopher Reeve had an accident. Generate a "true" Hypothesis :
CB	Premise : It was a complex language. Not written down but handed down. One might say it was peeled down. Generate a Hypothesis : the language was peeled down Generate a "neither" Hypothesis :

Table 4: Templates for self-generating in-context samples. Texts in red are manually designed prompts for generation and texts in blue are tokens representing the expected class.

[3]

Self-Generated In-Context Learning (SG-ICL) - Task 5

- Use the “Self-Generated In-Context Learning” to make the LLM correctly classify the following reviews for the “Rings of Power” TV-Show:
  - I really liked the show!!
  - People keep complaining, but I did not found it that bad, lol.
  - The moment Darth Vader said, “Luke I’m your father” is one of the best moment in cinema history
  - I loved when Gandalf went “You shall not pass!!!”

Tasks

Tasks 10.1 - Customer Service Dataset Generation

In this activity, you will generate a dataset with at least 500 entries, related to a company's customer service operations.

See details in Blackboard.

References

- https://www.vanderbilt.edu/generative-ai/prompt-patterns/#h2-audience-persona-pattern
- https://www.coursera.org/learn/prompt-engineering/home/module/1
- https://www.promptingguide.ai/
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