TYPES OF PROMPTING

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1. Importing Required Libraries

To begin working with different prompting techniques, the necessary libraries must be installed and imported. The required packages include LangChain, LangChain-OpenAI, and LangChain-Groq. After installation, the Groq API key is retrieved from the environment (such as Google Colab userdata), and a language model instance is created using the ChatGroq class. This setup allows us to send structured prompts to the model and receive responses.

2. Zero-Shot Prompting

Zero-shot prompting means asking the model a question without providing any examples. The model generates a response based solely on its prior training and understanding.

Revised Example Prompt:
"Explain what recursion is in programming. Provide a simple example in Python."

In this case, no sample answer is given beforehand. The model responds by defining recursion as a technique where a function calls itself to solve smaller instances of a problem. It explains the concept of a base case and recursive case, and then provides a simple Python example such as a function to calculate the factorial of a number.

This technique relies entirely on the model's internal knowledge without guidance from examples, making it useful for straightforward explanatory or conceptual questions.

3. One-Shot Prompting

One-shot prompting involves giving the model one example before asking a new question. This example helps guide the structure and style of the response.

Revised Example Prompt:

Example:
Q: What is iteration in programming?
A: Iteration is a programming technique where a block of code is repeated using loops such as for or while.

Now answer:
Q: What is recursion in programming?

In this case, the model observes the structure of the example and follows a similar concise explanation style.

Expected Model Response (Summary):

Recursion is a programming technique where a function calls itself to solve smaller instances of a problem. It typically includes a base case to stop the recursion and a recursive case to continue the process.

This Is One-Shot as:

- One example was provided.
- The model mimics the answer format.
- The example guides tone and brevity.

4. Few-shot prompting
   Few-shot prompting includes multiple examples before the final question. These examples act as demonstrations that help the model understand the pattern and produce a response aligned with the given format. Few-shot prompting is helpful when the task needs a specific structure, or when you want to reduce ambiguity. It generally increases output quality and consistency, but it can use more tokens because examples take space in the prompt.
5. RGC framework (Role–Goal–Context)
   RGC is a structured prompting method where the prompt clearly defines three parts: the role the model must play, the goal of the response, and the context or constraints. By specifying role (e.g., instructor), goal (e.g., explain recursion), and context (e.g., beginner audience, simple language), the model's output becomes more targeted and controlled. This improves clarity, relevance, and suitability for a specific audience.
6. Chain-of-thought prompting
   Chain-of-thought prompting encourages the model to reason step-by-step for better correctness, especially in logic and math problems. In assignments, it is recommended to instruct the model to think internally and give a short structured explanation rather than exposing raw step-by-step reasoning. This improves accuracy while keeping the final answer concise and clear.
7. Tabular format prompting
   Tabular prompting requests the model to format its response as a table with specified columns and rows. This is useful for comparisons (e.g., array vs linked list vs stack), because tables make it easier to read and evaluate differences. It improves presentation quality and helps the answer look more organized in an academic submission.
8. Fill-in-the-blank prompting
   Fill-in-the-blank prompting provides incomplete statements and asks the model to complete them. This method is useful for quick checks, quizzes, and revision-type questions. It tests whether the model can identify the correct term based on context and produces short, direct answers.
9. Combined practice prompting
   Combined prompting merges multiple strategies in a single prompt, such as using system instructions, RGC structure, and tabular output together. This is useful when you want maximum control over tone, structure, and depth. For example, you can set the model's role as a DSA instructor, request beginner-friendly explanation, ask for a table format, and include constraints like "keep it short." This produces highly structured, consistent outputs and is commonly used in professional AI workflows.