Mastering Advanced AI Prompting

A Guide to Fundamental Techniques, Strategic Architectures, and the Future of Model Interaction.

Presentation Overview

Key Topics for AI Excellence

Fundamental Prompting Techniques

The essential building blocks for effective communication with LLMs.

Advanced Prompting Strategies

Leveraging complex methods for superior, nuanced results.

Mixture-of-Experts (MoE)

Understanding the architecture driving next-generation AI performance.

Fundamental Prompting Techniques

Effective prompting starts with clear, structured instructions that guide the model toward the desired output.

Clarity and Specificity

Define the task, role, and constraints precisely. Avoid ambiguity to minimize model drift.

Context Setting

Provide necessary background information and examples (few-shot learning) to establish the required tone and format.

Iterative Refinement

Treat prompting as a dialogue. Refine instructions based on initial outputs to converge on quality results.

Advanced Prompting Strategies

Move beyond basic instructions to unlock complex reasoning and high-quality generation.

Chain-of-Thought (CoT)

Instruct the model to show its reasoning steps before providing the final answer, improving accuracy in complex tasks.

Retrieval-Augmented Generation (RAG)

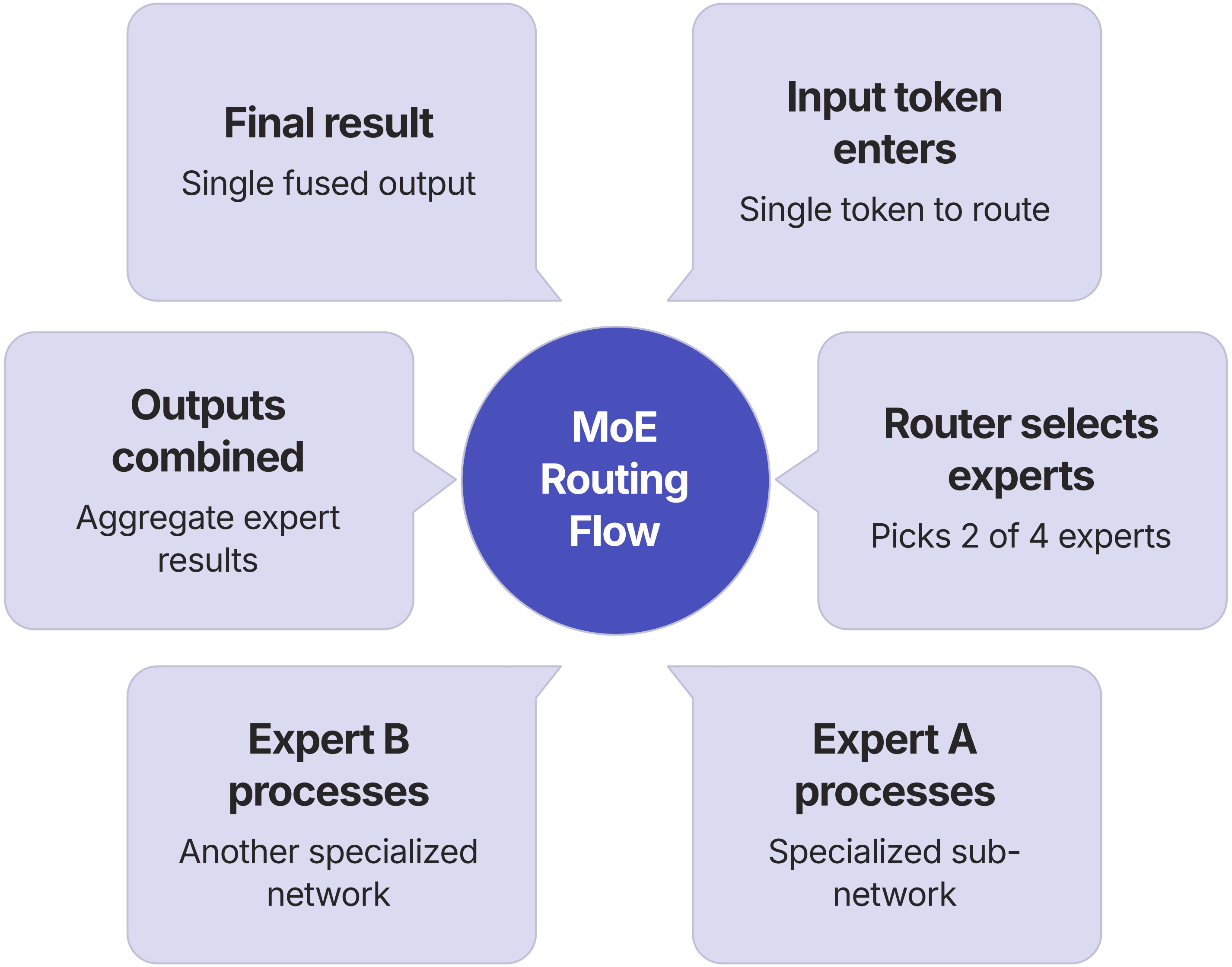
Integrate external knowledge sources into the prompt context for factually grounded responses.

Self-Correction & Reflection

Ask the model to critique its own output against a set of criteria and revise it, enhancing output quality.

Mixture-of-Experts (MoE)

MoE models utilize multiple specialized sub-networks ("experts") and a router to select the most relevant experts for a given input.



MoE Routing Flow

Input token enters

Single token to route

Router selects experts

Picks 2 of 4 experts

Expert A processes

Specialized sub-network

Expert B processes

Another specialized network

Outputs combined

Aggregate expert results

Final result

Single fused output

This architecture allows for massive models with high capacity, while only activating a fraction of the parameters per query, leading to faster inference and lower computational cost.

The MoE Advantage

Increased Capacity

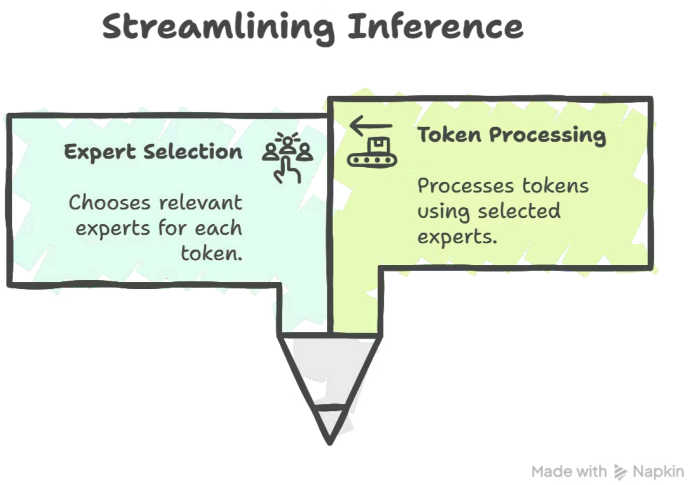
MoE models can be significantly larger than dense models, enabling them to learn more complex patterns and knowledge.

Efficiency

Only a subset of experts is used for each token, drastically reducing the computational load during inference.

Specialization

Experts can specialize in different types of data or tasks, leading to better performance across diverse inputs.


Streamlining Inference
Expert Selection
Chooses relevant experts for each token.
Token Processing
Processes tokens using selected experts.
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Action Item: Create a Testing Framework

Develop a structured framework to systematically evaluate and document the behavior of different prompt versions for a specific task.

01

Select a Prompt

Choose one prompt related to your project (e.g., text generation, summarization).

02

Create Versions

Modify parameters like tone, phrasing, model type (GPT-4/5), or temperature settings.

03

Systematic Testing

Test each version using your chosen model and record the results.

04

Document and Analyze

Record performance and output quality in a tabular format, noting how changes affect the model's output.

Testing Framework Documentation Structure

Use this format to record and compare the performance of your prompt variations.

1

Prompt Version

v1.0

v1.1

2

Goal

Generate blog post

Generate blog post

3

Model

GPT-4

GPT-4

4

Temperature

0.7

0.7

5

Output Quality

Good

Better

6

Notes

Too formal

Added tone guidance

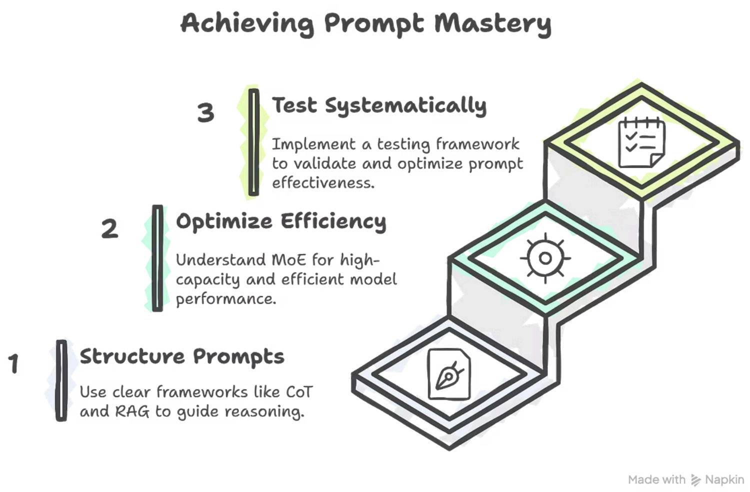
Analyzing Prompt Performance

This example demonstrates how different prompt versions, model parameters, and refinements lead to varied output quality.

Version	Prompt	Temp	Output Quality	Notes
v1	Write 150 words on AI in education	0.7	⭐⭐⭐	Basic, generic response
v2	Friendly tone + structure	0.7	⭐⭐⭐⭐	Better flow and engagement
v3	Role: Expert writer	0.3	⭐⭐⭐⭐⭐	Professional, concise, insightful
v4	Story-tone	1.0	⭐⭐⭐	Creative, but lacked factual depth
v5	With bullets + examples	0.7	⭐⭐⭐⭐⭐	Highly actionable and structured

Observing these changes helps in understanding the impact of each prompting technique on the final output.

Key Takeaways: The Path to Prompt Mastery


Achieving Prompt Mastery
3
Test Systematically
Implement a testing framework to validate and optimize prompt effectiveness.
2
Optimize Efficiency
Understand MoE for high-capacity and efficient model performance.
1
Structure Prompts
Use clear frameworks like CoT and RAG to guide reasoning.
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Structure is Power

Use clear structure (CoT, RAG) to guide complex reasoning.

Efficiency Matters

Understand MoE for high-capacity, efficient model performance.

Test Systematically

Implement a testing framework to validate and optimize prompt effectiveness.