

Prompt Engineering

Master the art of crafting effective prompts to unlock the full potential of large language models

What is Prompt Engineering?

The Definition

Prompt engineering is the process of **designing, structuring, and refining inputs (prompts)** to guide large language models (LLMs) towards desired outputs.

Think of it as learning to communicate with AI in the language it understands best—clear, structured, and contextual instructions that yield precise results.

Why It Matters

- Boosts [accuracy and relevance](#) in responses
- Reduces hallucinations and fabricated information
- Enhances reasoning capabilities and creative output
- Saves time by getting better results on the first attempt



Why Prompt Engineering is Important

Well-crafted prompts transform vague AI responses into precise, actionable insights. Here's how strategic prompt engineering addresses common challenges:

Vague Responses

Add clarity and context to guide the model towards specific, focused answers

Hallucinations

Define factual boundaries and constraints to prevent fabricated information

Generic Tone

Add style or role instructions to shape the voice and personality of responses

Unstructured Answers

Use format specifications or constraints to organise output systematically

Example Transformation

✗ "Tell me about AI." → Too vague, yields generic response

✓ "As a teacher, explain AI in 3 short bullet points for a beginner." → Specific role, format, and audience

Types of Prompts — Overview

Different prompt types create distinct behaviours in LLMs. Understanding these patterns helps you choose the right approach for your use case.

1 Static Prompt

Fixed text query without variables or dynamic elements

Example: "Summarise this paragraph."

2 Dynamic Prompt

Uses variables or placeholders for flexible, reusable templates

Example: "Summarise the paragraph: {text}"

3 Instruction Prompt

Explicit command defining role, task, or output requirements

Example: "You are a teacher. Explain AI simply."

4 Few-Shot Prompt

Provides input-output examples to demonstrate desired pattern

Example: "Hello → Bonjour, Thank you → Merci"

5 Zero-Shot Prompt

No examples provided; relies on model's general knowledge

Example: "Translate 'Good morning' to Spanish."

Chain-of-Thought (CoT) Prompting

What It Is

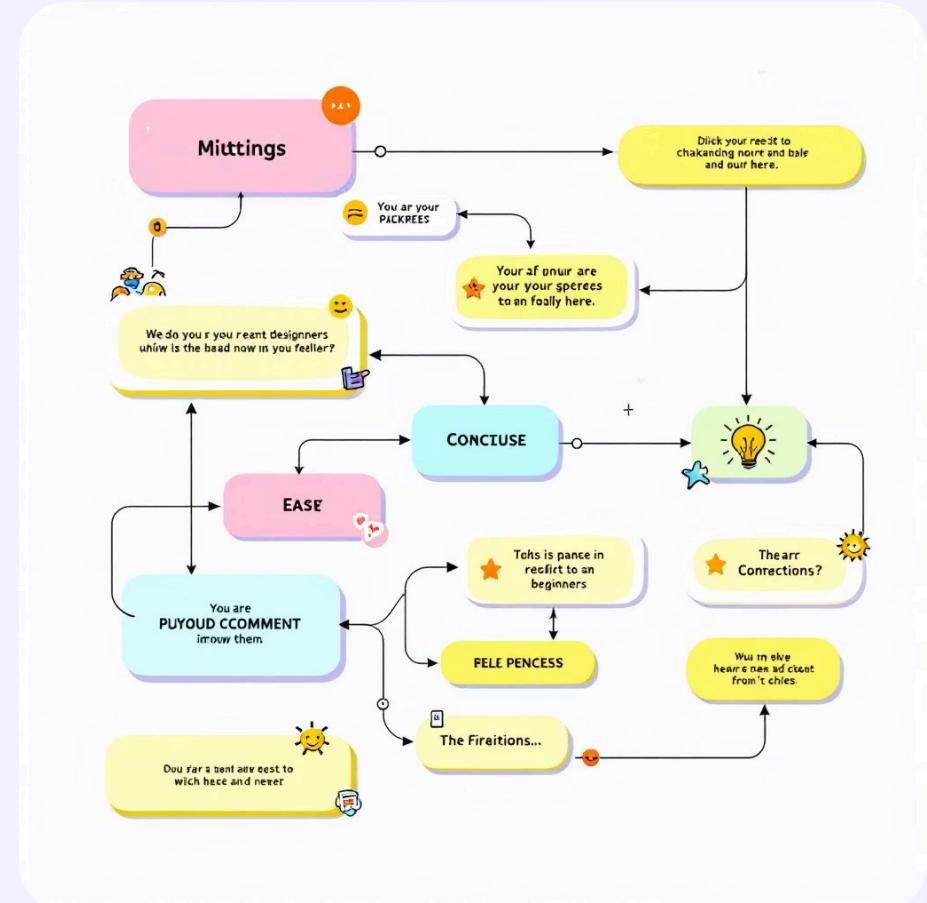
Chain-of-Thought prompting encourages the model to **think step by step** before arriving at a final answer. This technique mimics human problem-solving by breaking complex tasks into logical sequences.

Example Prompt

"Explain step by step how to calculate standard deviation."

Why Use It?

- Improves reasoning for complex problems
- Reduces logical errors and inconsistencies
- Particularly effective for multi-step or analytical tasks
- Makes the model's thinking process transparent





Role-Based Prompting

Role-based prompting assigns a [persona or role](#) to the AI, shaping its response tone, expertise level, and perspective. This technique ensures responses are contextually appropriate and domain-specific.

Data Analyst

"You are a data analyst. Explain this dataset's insights."

Teacher

"You are a primary school teacher. Explain photosynthesis."

Product Manager

"You are a PM. Create a feature prioritisation framework."

The Effect

Makes responses **context-specific** and relevant

Controls **tone and depth** of explanation

Adds **realism and authority** to outputs

Advanced Prompt Patterns

Beyond basic prompts, advanced patterns enable adaptive, iterative, and self-reflective AI interactions. These techniques are essential for complex workflows and high-quality outputs.



Context Prompting

Add background information to ground the response

Example: "Given the text below, summarise it in one line."



Meta Prompting

Ask the model to reflect on or improve its own response

Example: "Rewrite your previous answer more concisely."



Reflexive Prompting

Multi-turn refinement through iterative feedback

Example: "Now check for bias in your previous response."

- ❑ **When to Use:** These patterns excel when you need adaptive responses, quality refinement, or iterative problem-solving across multiple interactions.

Core Principles of Prompt Design

Effective prompts follow five fundamental principles. Master these to consistently generate high-quality AI outputs.

1 Clarity

Be direct and specific. Avoid ambiguity or vague language that could be interpreted multiple ways.

2 Context

Provide background information, examples, or situational details to ground the response appropriately.

3 Constraints

Define output requirements: tone, length, format, style, or structural specifications.

4 Structure

Use formatting like lists, bullet points, numbered steps, or JSON to organise complex outputs.

5 Iterate

Test your prompts, analyse results, refine instructions, and re-prompt based on what works.

Practical Example — From Bad to Better

See how progressive refinement transforms a basic prompt into an expert-level instruction that yields precise, contextual results.



✗ Basic Level

Prompt: "Explain machine learning."

Result: Too general, lacks focus, produces textbook definition



⚙️ Improved Level

Prompt: "In 2 lines, explain machine learning to a 10-year-old."

Result: Simplified language, constrained length, age-appropriate



✓ Expert Level

Prompt: "You are a teacher. Explain machine learning using an everyday example."

Result: Context-rich, relatable analogy, role-appropriate tone





The Art of Prompting

The Formula

Prompt = Instruction + Context +
Constraints

The Principle

Better prompts lead to smarter,
more focused AI outputs every
single time

The Truth

Prompt engineering is a **skill** that improves with practice, not just
asking questions

"You don't need a bigger model—you
need a smarter prompt." 

Start experimenting today. Refine your approach with each interaction. The
best prompt engineers are made through consistent practice and curiosity.