# Prompt Engineering & Its Types

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# What is Prompt Engineering?

- Crafting inputs to guide AI models like ChatGPT, Gemini, Claude, etc.
- Objective: Generate accurate, helpful, and relevant responses.
- Essential for building effective GenAI applications.

# Why Prompt Engineering Matters

- Improves AI output accuracy and reliability.
- Reduces hallucinations (false information).
- Boosts productivity in tasks such as:
- • Text summarization
- • Content creation
- • Code generation
- • Customer support

## Zero-shot Prompting

- No examples given — only task is specified.
- Example:
- Prompt: "Translate to Spanish: Good morning"
- Output: "Buenos días"

# One-shot Prompting

- One example provided to guide the model.
- Example:
- Prompt: "Translate English to Spanish.
  English: Hello → Spanish: Hola
  English: Good night →"
- Output: "Buenas noches"

# Few-shot Prompting

- Multiple examples provided to help model learn pattern.
- Example:
- Prompt: "Translate English to Spanish:
  English: Hello → Hola
  English: Good night → Buenas noches
  English: Thank you →"
- Output: "Gracias"

## Chain-of-Thought Prompting

- Encourages model to reason step-by-step.
- Example:
- Prompt: "If there are 5 apples and you eat 2, how many are left?
  Let's think step-by-step."
- Output: "There were 5 apples. You ate 2. 5 - 2 = 3 apples left."

# Role-based Prompting

- Assigns a specific role or persona to the AI.
- Example:
- Prompt: "You are a helpful doctor. Suggest remedies for a cold."
- Output: "Stay hydrated, rest, use steam, and take vitamin C."

## Instruction-based Prompting

- Gives clear, direct instructions to the model.
- Example:
- Prompt: "Summarize the following text in 3 bullet points."
- Output: "- Main idea 1
  - Main idea 2
  - Main idea 3"

## ReACT Prompting (Reason + Action)

- Combines reasoning and tool use (used in agents like LangChain).
- Example:
- Prompt: "Thought: Need weather info.
  Action: Search['Weather in Lahore']
  Observation: 35°C and sunny"

## Advanced Prompting Techniques

- • Prompt Chaining – Combine multiple prompts step-by-step.
- • Self-Consistency – Run multiple prompts and select best.
- • Prompt Tuning – Optimize prompts using embeddings.

# Real-world Applications

- • AI Chatbots (Customer Service, Therapy)
- • PDF & Resume Assistants
- • Educational Tutors
- • Medical Advisors and Symptom Checkers

# Best Practices for Prompt Engineering

- • Be clear and specific.
- • Use structured formats (e.g., lists, JSON).
- • Provide relevant examples.
- • Iterate and test different prompt styles.

# Conclusion

- Prompt engineering is a key skill in AI and GenAI.
- It improves response quality and model performance.
- Helps build smarter, more reliable AI systems.

**Q&A**

- Any questions or examples you'd like to try together?