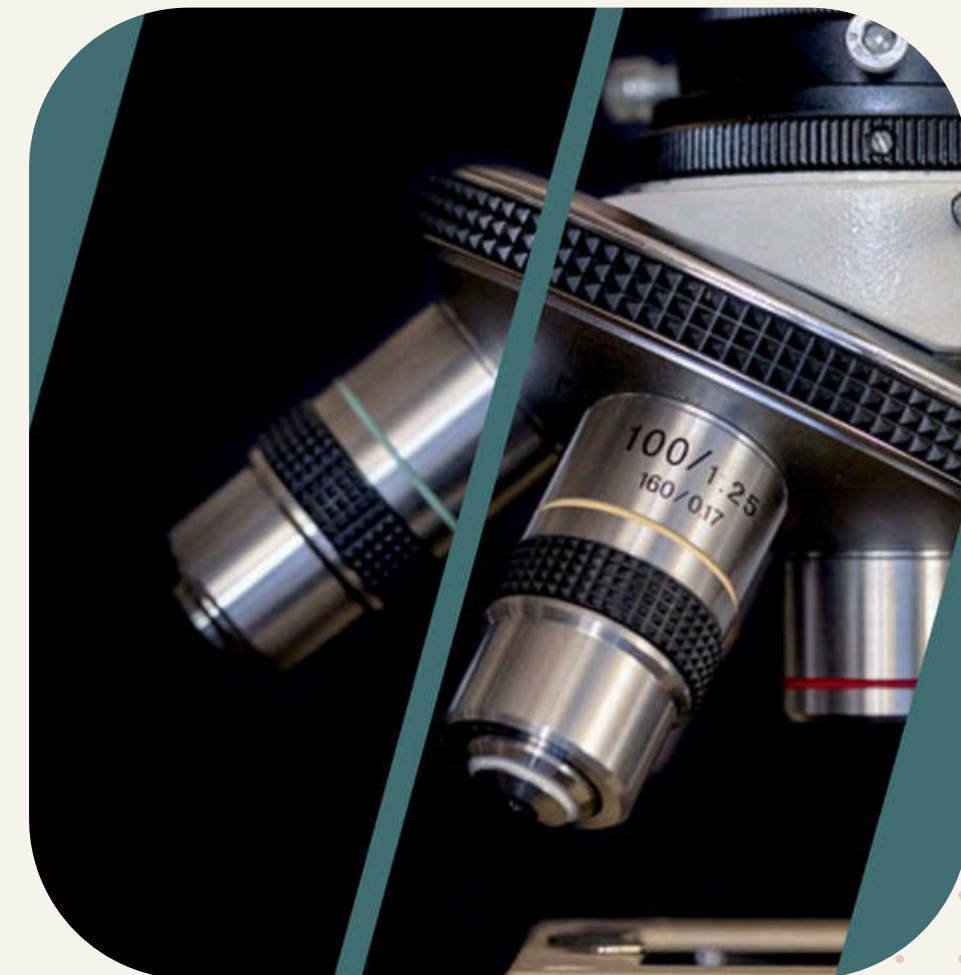# PROMPT ENGINEERING

Presented By : Dhruvi Mehta

INTRODUCTION OF PROMPT ENGINEERING

- **Prompt engineering is the process of writing instructions to get the best output from an AI model. It's a key part of generative AI, which is changing how people interact with technology.**

HISTORY OF PROMPT ENGINEERING

- ### 1950s–1980s
  Early AI and NLP foundations (Turing Test, ELIZA, expert systems).

- ### 1990s–2010s
  Machine learning and deep learning improved NLP (Word2Vec, rule-based systems).

- ### 2017s–2020s
  Rise of large language models (Transformer architecture, GPT-1 to GPT-3).

- ### 2021s
  Present: Prompt engineering becomes a key discipline (zero-shot, few-shot, CoT prompting, ChatGPT, GPT-4).

USES OF PROMPT ENGINEERING

1. **Chatbot Development**
   Utilizing prompt engineering to create conversational
   agents that understand human language effectively.

2. **Content Generation**
   Applying prompt engineering techniques to automatically
   generate articles, stories, or summaries.
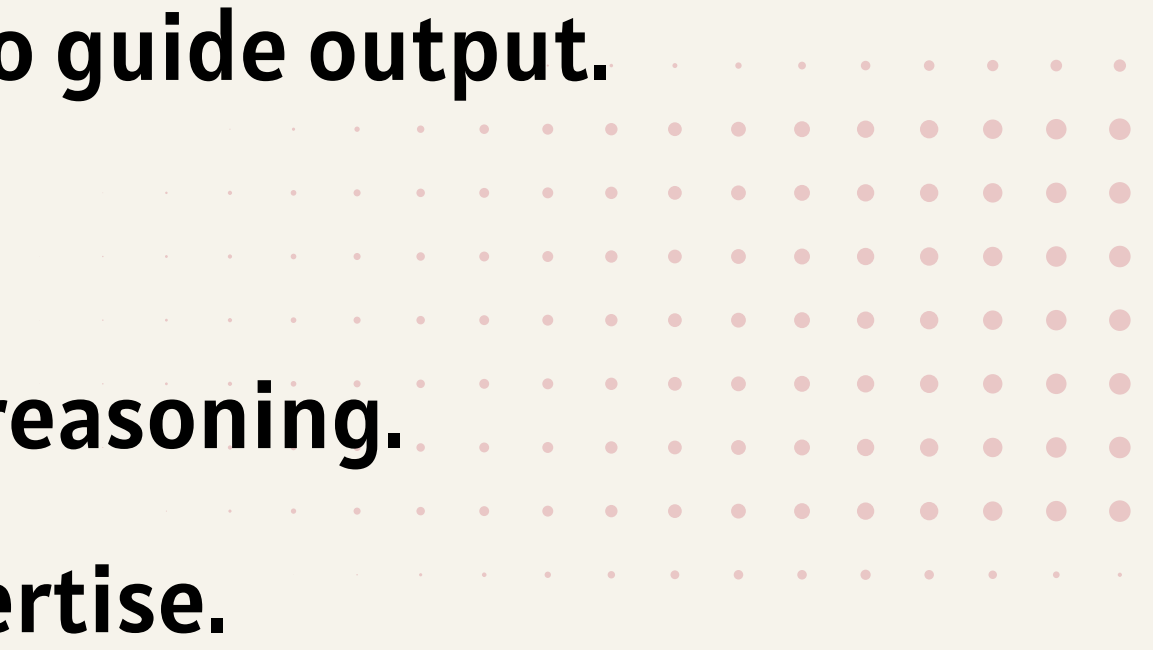
3. **Data Analysis**
   Empowering data scientists to leverage prompts for
   extracting meaningful insights from large datasets.

4. **Personalized Recommendations**
   Using prompt engineering to enhance recommendation
   systems for tailored user experiences.

TYPES OF PROMPT

1. Instruction-Based Prompt – Direct command or request.

2. Open-Ended Prompt – Encourages exploration or discussion.

3. Contextual Prompt – Provides background information for a response.

4. Example-Based Prompt – Uses patterns or references to guide output.

5. Multi-Turn Prompt – Builds on previous interactions.

6. Chain-of-Thought Prompt – Encourages step-by-step reasoning.

7. Role-Based Prompt – Assigns a specific persona or expertise.

PLATFORMS SUPPORTING PROMPT EGG.

	Features	Use Cases	Access Method
OpenAI	API for LLMs	Chatbots	Web Interface
Google	BERT, T5	Search Optimization	Cloud-Based
Microsoft	Azure Integration	Code Assistance	API Access
Hugging Face	Transformers Library	Research, Development	Open Source

KEY FEATURES OF EFFECTIVE PROMPT ENGINEERING

- Clarity :- Ensure each prompt clearly specifies the desired outcome or response.

- Contextual Relevance :- Prompts should include relevant context to guide the AI's generation.

- Conciseness :- Keep prompts short while still conveying essential information.

- Direct Instruction :- Use imperative language to direct the AI towards specific tasks.

- Balanced Specificity :- Provide enough detail without overwhelming the AI to maintain flexibility.

- Iterative Testing :- Regularly refine prompts based on AI response quality and relevance.

- User Input :- Leverage user feedback to improve and adapt prompt strategies.

ADVANTAGES OF USING PROMPT ENGINEERING

1. Improves AI Output Quality

2. Enhances Customization and Personalization

3. Enhance Clarity

4. Boost Creativity

5. Enhance AI Debugging And code Assistance

6. Support Multi-Model AI(text, image, audio, video, code)

DISADVANTAGES OF USING PROMPT ENGINEERING

1. Dependency
2. Bias
3. Complexity
4. Context Limitation
5. Efficiency
6. OverFitting
7. User Expertise

BEST PRACTICES FOR WRITTING PROMPT

● **Clarity**

● **Specificity**

● **context**

● **Instruction**

● **Examples**

● **Testing**

● **Conciseness**

APPLICATIONS

AI-Powered Content Generation

- Writing articles, blogs, and essays
- Generating creative stories, poems, and scripts

Chatbots & Virtual Assistants

- Enhancing customer support responses
- Automating FAQs and troubleshooting

Healthcare & Medical Applications

- Assisting in medical report summarization
- Generating patient-friendly explanations of conditions

Data Analysis & Research

- Extracting insights from large datasets
- Generating reports and summaries

SOLUTION

● **Clear and Specific Prompts**

Instead of: "Explain Nodejs"
Use: "Explain Nodejs Json Web Token example."
Solution: Be precise to get relevant responses.

● **Format-Specific Prompts**

Instead of: "Explain JavaScript."
Use: "Explain JavaScript closures with an example."
Solution: Specify output format (list, table, step-by-step).

● **Step-by-Step Prompts**

Instead of: "Solve this math problem: 5x + 10 = 30."
Use: "Solve the equation 5x + 10 = 30 step by step."
Solution: Guide AI to break down complex tasks.

● **Real-Time Debugging & Improvement**

Example Prompt for Debugging:
"Find and fix errors in this JavaScript function. Explain the mistake."

FUTURE TRENDS

- Automated Prompt Optimization

- Multimodal Prompt Engineering

- AI-Powered Code Generation & Debugging

- Natural Language-Based Prompting
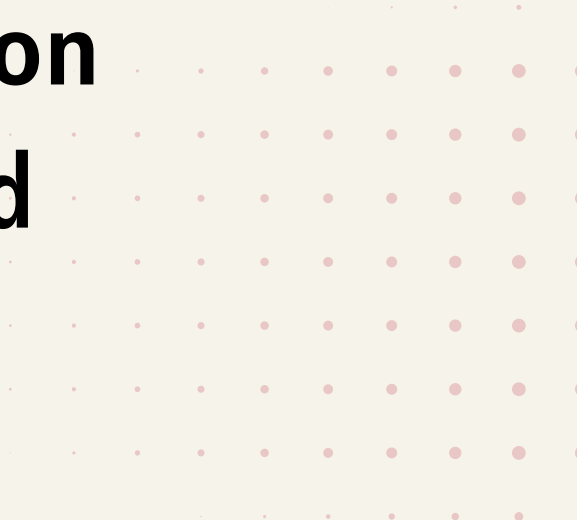
- Dynamic Prompt Chaining & Self-Correction

HOW PROMPT SPECIFICITY CHANGES RESPONSES

Bad Prompt: "Explain Node.js" → Gives a generic explanation

Better Prompt: "Explain Node.js authentication" → Narrows it down

Best Prompt: "Give a complete Node.js JWT token authentication example with Express.js, including login, protected routes, and middleware."

EXAMPLES

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