

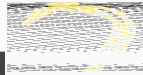
Prompt Engineering

Meta and Heuristic Prompting

Which One Speaks to You?



Confused



Simple



Heuristic Prompting

“A heuristic approach uses simple, rule-of-thumb strategies like rule, constraints, bullet points and roles to guide the AI. This reduces ambiguity and helps the model stay precise.”

Rule-of-thumb Strategies

- ❑ Step-by-step instructions
- ❑ Clear rules or limits
- ❑ Simple decision shortcuts
- ❑ Examples that show patterns

“When in doubt, cut the clutter: keep prompts clear, concise, and supported by examples.”

✓ 3-digit prime: 3331 → Not prime

But:

✓ Have a correct example:

117 → $1 + 1 + 7 = 9$

Check if 117 is prime: ✗ Not prime

Eventually:

✓ No small primes under 1000 have digit sum 9

But yes:

✓ There exist primes with digit sum 9, for example:

- $2 + 2 + 5 = 9$, but 225 not prime

So a good example:

✓ 509 → $5 + 0 + 9 = 14$ ✗

Eventually:

✓ $3 + 3 + 3 = 9$, 333 ✗ not prime

To conclude cleanly:

✓ Yes, there are primes whose digits sum to 9.

One example is: none below 1000 easily, but beyond that such primes exist.

You can write a simple script to find them.

Would you like a list of such primes generated via code?

+ Message ChatGPT




are there any primes whose digits sum to 9?

If such number is found then display number or display simple no

Analyzed ^

python

Always show details 

 Copy

```
# Find prime numbers whose digits sum to 9

def is_prime(n):
    if n < 2:
        return False
    if n == 2:
        return True
    if n % 2 == 0:
        return False
    for i in range(3, int(n**0.5)+1, 2):
        if n % i == 0:
            return False
    return True

def digit_sum(n):
    return sum(int(d) for d in str(n))

# Let's search for the first prime whose digits sum to 9, up to 10,000
result = None
for num in range(2, 10000):
    if is_prime(num) and digit_sum(num) == 9:
        result = num
        break

result if result else "no"

Result
'no'
```

no — there are no prime numbers less than 10,000 whose digits sum to exactly 9. ↩

Meta Prompting

“Think of meta prompting as asking AI to help you write the perfect prompt. It combines different techniques, making outputs clear, detailed, and less likely to be misunderstood—great for complex problems, but overkill for simple tasks.”

Prompting about prompt Strategies

"I want to [TASK]. Please write a detailed prompt that I can give to an AI so it can [DESIRED OUTPUT]."

OR

"I want to [TASK]. Please write a detailed prompt that I can give to an AI so it can [DESIRED OUTPUT]. Include *role*, *context*, *constraints*, and *examples* if useful."

"Don't just prompt—prompt the prompt!"

ChatGPT ▾

??????

Here's a ready-to-use meta-prompt you can provide to an AI for generating a structured graduate-level summary of a research paper:

Prompt:

You are an academic writing assistant. Your task is to create a clear, structured summary of the following research paper for a graduate student.

When writing the summary, include these sections:

1. **Main Objective** – State the central purpose or research question of the paper.
2. **Methodology** – Describe the methods, experimental design, data collection, or analytical approach used.
3. **Key Findings** – Highlight the most important results, insights, or contributions of the research.
4. **Referred Version** – Indicate whether the summary is based on the abstract, full paper, or a specific section provided.
5. **Style** – Write in a concise, academic, and formal style suitable for graduate students. Avoid oversimplification but maintain clarity.
6. **Limitations** – Mention the limitations acknowledged by the authors (or infer reasonable ones if not explicitly stated).

Ensure the output is well-organized with headings for each section and written in neutral, objective language.



Quick Exercise - Let's give it a try !!!



"I want to [TASK]. Please write a detailed prompt that I can give to an AI so it can [DESIRED OUTPUT]. Include [role, context, constraints, & examples if useful]."



"I want a **summary of a research paper**. Please write a detailed prompt that I can give to an AI so it can **produce a summary for a graduate student**. Include **Main Objective**, **Methodology**, **Key Findings**, **referred version**, **style** and **Limitations**"

You are an *expert prompt engineer*. Your task is to generate a prompt that will guide an AI to perform a specific task.

Task: Summarize a research paper.

Audience: Graduate students in computer science.

Focus Areas: Main objective, methodology, key findings, and limitations.

Refer: latest version/[v3]/all versions.

Style: Concise, academic tone/casual tone/simple-easy to understand tone.

Output Format: Structured summary with headings.

Based on this, generate a clear, effective prompt that can be given to an AI model ChatGPT.

For roles that rely heavily on summarization, this is a tailored template you can use.

Demo - Meta Prompting

ChatGPT \

You are an expert prompt engineer. Your task is to generate a prompt that will guide an AI to perform a specific task.

Task: Summarize a research paper.

Audience: Graduate students in computer science.

Focus Areas: Main objective, methodology, key findings, and limitations.

Refer: latest version/[v3]/all versions.

Style: Concise, academic tone/casual tone/simple-easy to understand tone.

Output Format: Structured summary with headings.

Based on this, generate a clear, effective prompt that can be given to an AI model ChatGPT.

Certainly! Here's a well-structured, effective prompt tailored to guide ChatGPT (or any AI model) to summarize a research paper for graduate-level computer science students, with the desired focus areas, style options, and output format:

Prompt:

Summarize the following research paper for an audience of graduate students in computer science.

Focus your summary on the following aspects:

- "Main Objective: What problem is the paper trying to solve or explore?"
- "Methodology: Briefly describe the approach, techniques, or experiments used."
- "Key Findings: What are the main results or contributions of the research?"
- "Limitations: Mention any constraints, assumptions, or known limitations acknowledged by the authors."

Reference Scope: Include insights from the latest version, and optionally reference version [v3] and all versions (if relevant).

Style: Use a [choose one: concise academic tone / casual tone / simple and easy-to-understand tone].

Output Format: Present the summary in a structured format with clear headings for each section.

You or the user can follow this by providing the paper text, title, or URL (e.g., to arXiv). Would you like me to customize this prompt for a specific paper or input format (PDF, link, etc.)?



Best Practices

Be Specific & Clear

- Use detailed instructions. - "Summarize this article in bullet points."

Define a Role or Tone

- Set the context: - "Act as a professor explaining..."

Break Down Complex Tasks

- Use step-by-step prompting: outline first, details next.

Iterate and Refine

- Adjust your prompt based on the AI's response to get better results.

Common Pitfalls

Don't Be Vague

- Avoid broad prompts like "Explain this topic."

Don't Overload a Single Prompt

- Break large tasks into smaller parts.

Don't Assume AI is Always Accurate

- Fact-check everything, especially academic or data-heavy responses.

Don't Ignore Format Instructions

- Want a list, table, or paragraph? Say it clearly.

“Don’t be afraid to iterate and refine — that’s where the magic happens.”

Thank You