

# LLM: Prompts and Applications

Introduction to Prompt Engineering

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Insper

A decorative graphic on the right side of the slide. It consists of three overlapping squares: a black one in the middle, a red one in the foreground, and a light gray one with diagonal stripes in the background. The red square is partially overlapping the black one, and the striped square is partially overlapping the black one.

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# Prompt Fundamentals

***Mentimeter***



# ***What is a Prompt?***

- A prompt is a textual input that guides a Large Language Model (LLM) to generate a response. It acts as a bridge between the user's intent and the model's response.
- It can range in size, structure and vary from a simple question to a detailed instruction or scenario.
- How well a prompt is formulated determines the quality and relevance of LLM outputs.

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"73, 31, 56, 88, 12, 47, 35, 63, 92, 20, 17, 45, 68, 90, 39, 81, 55,  
26, 81, 75, 50, 23, 14, 61, 80, 34, 29, 56, 97, 11, 20"

# ***Prompt Engineering as a Skill***

A Prompt Engineer specializes in the art and science of crafting precise and strategic inputs (prompts) to guide AI models in producing relevant, accurate, and innovative outputs.

- Goals of a Prompt Engineer
  - **Create prompts** to extract high-quality outputs aligned for specific tasks.
  - **Evaluate:** Iterative test prompts, review results, and adjust for better performance.
  - Collaborate with others specialist to integrate models into products and services.
- To read more:
  - [How to Become a Prompt Engineer in 2025](#)

**What skill, in your opinion,  
are important for a prompt  
engineer?**



# ***Prompt Engineer Skills***

The skills that a prompt engineer needs are:

- **Technical Knowledge** and understanding of AI Models
- **Curiosity:** Trying different services and models.
- **Communication:** Clearly articulating complex ideas.
- **Creativity:** Crafting innovative prompts and scenarios.
- **Critical thinking:** Analyzing results, identifying biases.
- **Attention to detail:** Ensuring precision in prompt engineering.
- **Collaboration:** Working with cross-functional teams.
- **Adaptability:** Staying updated with AI advancements.

**What makes a PROMPT  
“GOOD” or “BAD”?**

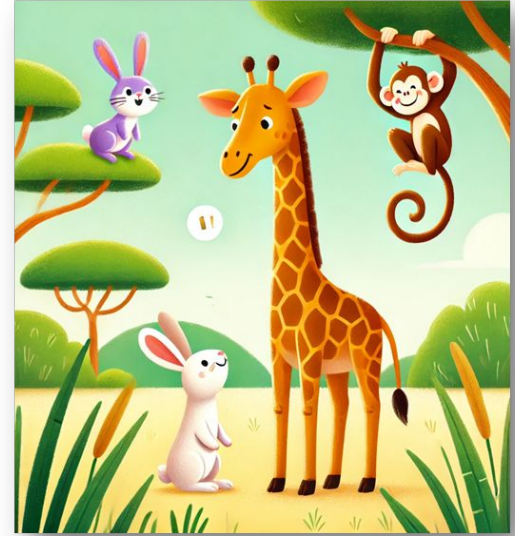
# ***“Good” and “Bad” Prompts***



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## **“BAD” Prompt**

- Write poem about a girafa



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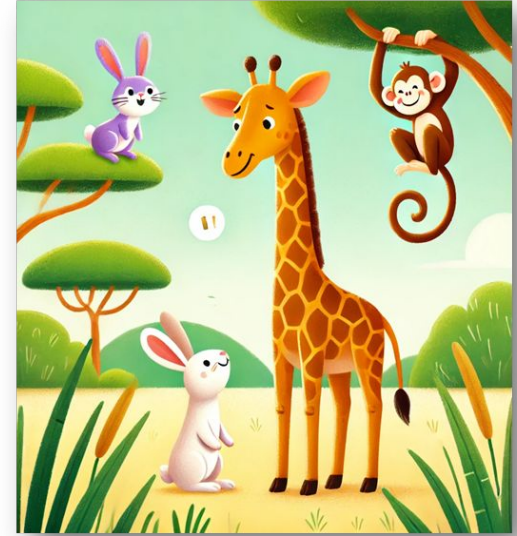
- Write poem about a girafa

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## **“GOOD” Prompt**

- Assume the role of a children's book writer. Write a playful and engaging poem for 5-year-olds about a giraffe who, with the help of its animal friends, overcomes its anxiety. Include a positive message about friendship and self-confidence, using simple language and a cheerful tone suitable for young children. Limit the poem to three short paragraphs.



# ***What makes a PROMPT “GOOD” or “BAD”?***

## **BAD PROMPT**

**VS**

## **GOOD PROMPT**

- Vague or Ambiguous
- Confusing or Contradictory Instructions
- Lack of Context or Clear Purpose
- Too Many Undefined Variables
- Excessive or Irrelevant Length
- Misspelled words

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- Specific and Detailed
- Clear and Straightforward
- Appropriate Context
- Uses Examples or Visual Descriptions
- Suitable Length and Complexity
- Grammatically correct



# ***Characteristics of “Good” Prompts***

- **Clarity**

- Use simple, specific language.
- Example: “Summarize the main points of the article in two sentences.”
  - Unclear: “Can you tell me about the article?”

- **Precision**

- Avoid ambiguity and overly broad statements.
- Example: “What are three challenges faced by renewable energy adoption?”
  - “Tell me about renewable energy.”

- **Relevance**

- Align prompts directly with the intended task or learning outcome.
- Example: “Explain how market trends affect supply chain strategies in the retail industry.”
  - Too broad: “What are market trends?” or “What is a supply chain?”

# ***Prompting Techniques***

## **Explicit vs. Implicit Instructions**

- **Explicit:** Clearly states what is expected.
  - "List three advantages of renewable energy in bullet points."
- **Implicit:** Assumes the model will infer intent from the context.
  - ""Why is renewable energy important?"

## **Asking the Right Questions**

- Define the desired format (list, summary, explanation).
- Be specific with constraints (length, style, audience).

## **Structure and Language**

- **Impact of Phrasing:** Small changes can alter the output significantly.
  - **General:** "Describe climate change."
  - **Specific:** "Explain climate change."

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  - **Specific:** "Explain climate change."

Explain" tends to focus on breaking down the concept and making it understandable. While "describe" asks for more of an overview.

# Common Pitfalls in Prompting

- **Over-complicated language and instructions**
  - **Avoid:** “Analyze and compare the overarching themes in the provided texts with a focus on the socio-economic implications in 500 words or more.”
  - **Better:** “Compare the main themes in the provided texts in 3–4 sentences.”
- **Asking multiple questions in one prompt**
  - **Avoid:** “What are the main challenges of AI? How does it impact jobs? What are the benefits?”
  - **Better:** “What are the main challenges of AI?” ...
- **Leading or biased questions**
  - **Avoid:** “Don’t you think renewable energy is the only viable solution to climate change?”
  - **Better:** “What are the benefits and challenges of renewable energy in addressing climate change?”

# Quiz

Which one is the better prompt?

- "Provide a comprehensive overview of three methods to improve team collaboration in a corporate environment. In your answer, please detail why team collaboration is critical for organizational success, explain each method in depth including its background and historical implementation, describe potential pitfalls or challenges associated with each method, offer specific examples or case studies to illustrate their effectiveness, and discuss any counterarguments or alternative perspectives. Conclude with a summary of the key benefits these methods offer."
- "List three effective strategies for improving team collaboration in a corporate setting."

# Quiz

Which one is the better prompt?

## **Prompt A (BAD):**

- "Provide a comprehensive overview of three methods to improve team collaboration in a corporate environment. In your answer, please detail why team collaboration is critical for organizational success, explain each method in depth including its background and historical implementation, describe potential pitfalls or challenges associated with each method, offer specific examples or case studies to illustrate their effectiveness, and discuss any counterarguments or alternative perspectives. Conclude with a summary of the key benefits these methods offer."

## **Prompt B (GOOD):**

- "List three effective strategies for improving team collaboration in a corporate setting."

## **Quick Explanation:**

Prompt A over-explains by including numerous detailed instructions that can overwhelm the responder and divert attention from the primary task. In contrast, Prompt B is concise and directs the responder to focus solely on listing three strategies, resulting in a clearer and more targeted answer.

# Quiz



# ***How the Quiz was Generated***

I'm currently creating a quiz on prompt engineering. Please help me create a GOOD/BAD prompt pair for students to try to decide which one is which.

When generating, separate in 3 levels - easy, medium and hard - where at each higher level, it should be less clear of what made a prompt BAD.

The GOOD should not always be bigger than the BAD prompt

Lastly add a quick explanation for the reasoning for the GOOD prompt.

Here is a example:

---

Which one is the good prompt, and why?

1. "Tell me everything about how we can make customers happier and what else we can do to make the company better overall."
2. "Provide three actionable suggestions to improve customer satisfaction based on the survey data below."



# Context Windows & System Prompts

# ***Task 1: Learning About Chat Models***

**Your goal is to answer the following questions:**

## **1. System Prompts:**

- a. What is a system prompt in AI models?
- b. Why are system prompts important, and how do they influence model behavior?

## **2. Context Windows:**

- a. What is a context window?
- b. Why is it important for maintaining coherent conversations or tasks?

# ***System Prompts in Chat Models***

A system prompt is a directive or set of instructions given to a chat model at the start of a session. It establishes the model's behavior, tone, and objectives for the conversation.

## **Key Roles of System Prompts**

- **Behavior Shaping**
  - Defines the model's personality and role (e.g., formal, casual, technical).
- **Boundaries Setting**
  - Establishes ethical and functional constraints, ensuring adherence to specific policies.
- **Contextual Framing**
  - Prepares the model with a particular context or background knowledge relevant to the session (e.g. history and relevant information)

## **Limitations**

- Cannot adjust dynamically during a session.
- Overly complex prompts may confuse the model.

# ***Understanding Context Windows***

## **What is a Context Window?**

- A context window represents the amount of text (**tokens**) a model processes at one time.
- It defines the boundaries of the model's "short-term memory" during a conversation or response generation.

## **What Are Tokens?**

- Tokens are chunks of text, such as words, parts of words, or punctuation.
- Models have a fixed token limit (e.g., 4,096 tokens for GPT-3.5), where Input + Output must fit within this limit.

## **Measuring Tokens [\[1\]](#)**

- 1 token  $\sim$  4 chars in English
- 1,500 words  $\sim$  2048 tokens

# ***Memory and Context Windows***

At this point, we have notice that when you prompt an chat service, the model remembers yours previous conversation.

**How Do Models "Remember" Conversations?**

# ***Memory and Context Windows***

At this point, we have notice that when you prompt an chat service, the model remembers yours previous conversation.

## **How Do Models "Remember" Conversations?**

- Models appear to "remember" previous interactions in a chat.
- **Fact:** This memory is not a function of the transformer architecture itself.

By using system prompts, chat system aggregates past conversations into the current prompt including past interaction and **simulating memory**.

# ***Truncation and Its Effects***

## **Impact of Exceeding Token Limits**

- Excess tokens are truncated (cut off) from the oldest part of the context.
- Can result in incomplete or incoherent responses.

## **Strategies to Manage Truncation**

1. Summarize Long Inputs: Condense key information before sending to the model.
2. Chunk Conversations: Break down input into manageable sections.
3. Selective Retention: Prioritize critical information to include.

# Knowledge Base Integration



# ***Knowledge Cutoff***

An AI only knows information until its knowledge cutoff. A knowledge cutoff, is a date that model creators use to indicate the end of the pre-training data for their model.

Try prompting models: “What is yours knowledge cutoff.”

Information availability is also a knowledge limitation, as this type of information could not be prominent on the training dataset.

- [Conversation](#)

# ***Knowledge Base Integration - User Provided Information***

Works the same as providing context on your prompts, telling the model additional information such as your name, or what you are currently working on.

- Use clear and concise descriptions:
  - Example: “My name is John, I am preparing a presentation on integrating external data into AI prompts.”
- Include relevant details for personalized responses
  - Task Objectives
  - Task Limitation and parameters
  - Your role and what you expect from the task.

# ***Knowledge Base Integration - Document / Webpage***

In some service you can upload a document or add a webpage link. If this feature is not available, let's do the following:

1. For weblink, print the page as pdf.
2. Start the prompt by asking the AI to read and understand the information that will be added, e.g:
  - a. Summarize the following information about renewable energy trends... [\[link\]](#)
3. Copy the pdf content and paste in your prompt guarded by triple-quotes (“”)

# ***Knowledge Base Integration - Table***

## ***Data***

In some service you can upload a table document, such as excel files. If this feature is not available, let's do the following:

1. Open the file and export as a csv-file.
  - a. This is optional, but a csv file is better formatted because copying a table and pasting can break the structure.
2. Start the prompt by asking the AI to read and understand the information that will be added, e.g:
  - a. Read the following data and quickly summarize what it is
3. Open the csv-file with a text editor such as “notepad” and copy the content and paste in your prompt guarded by triple-quotes (“”)

# Tasks

# ***Task 1: Crafting Good Prompts***

1. Ask the AI to write a poem based on an illustration. In this task, you must create a prompt that accurately describes the image so the AI can generate a poem that matches its theme.

**Important: Do not upload the image.**







## ***Task 2: Knowledge Base Integration***

1. Based on the following article, create at least 3 slides about the content.
  - a. [O que é engenharia por prompt? - Explicação da engenharia por prompt de IA - AWS](#)
2. Based on the following spreadsheet, write a social media campaign message, highlighting the most liked aspects of the product.
  - a. **Blackboard - Task 3.2**



# Inspire

