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Extracted Study Material (Partial View):

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Prompt Engineering
Slides by Elvis Saravia https://www.promptingguide.ai/  and images
from other sourcesAgenda
•Introduction  to Prompt  Engineering
•Advanced  Techniques  for Prompt  Engineering
•Conclusion  & Future DirectionsRise of In -context Learning
Brown, Tom B. et al. "Language Models are Few -Shot Learners." ArXiv  abs/2005.141
•Prompts  involve  instructions  and context  passed  to a
language  model to achieve a desired task
•Prompt  engineering  is the practice  of developing  and
optimizing  prompts  to efficiently  use language  models
(LMs)  for a variety  of applications
•Prompt  engineering is  a useful  skill for  AI engineers  and
researchers  to improve  and efficiently  use language  models
What is prompt engineering?
Prompt engineering  is a process of creating  a set of prompts,
or questions,  that are used to guide the user toward a desired
outcome.  It is an effective  tool for designers  to create user
experiences  tha...
```

📝 Summary:

Prompt Engineering Summary:

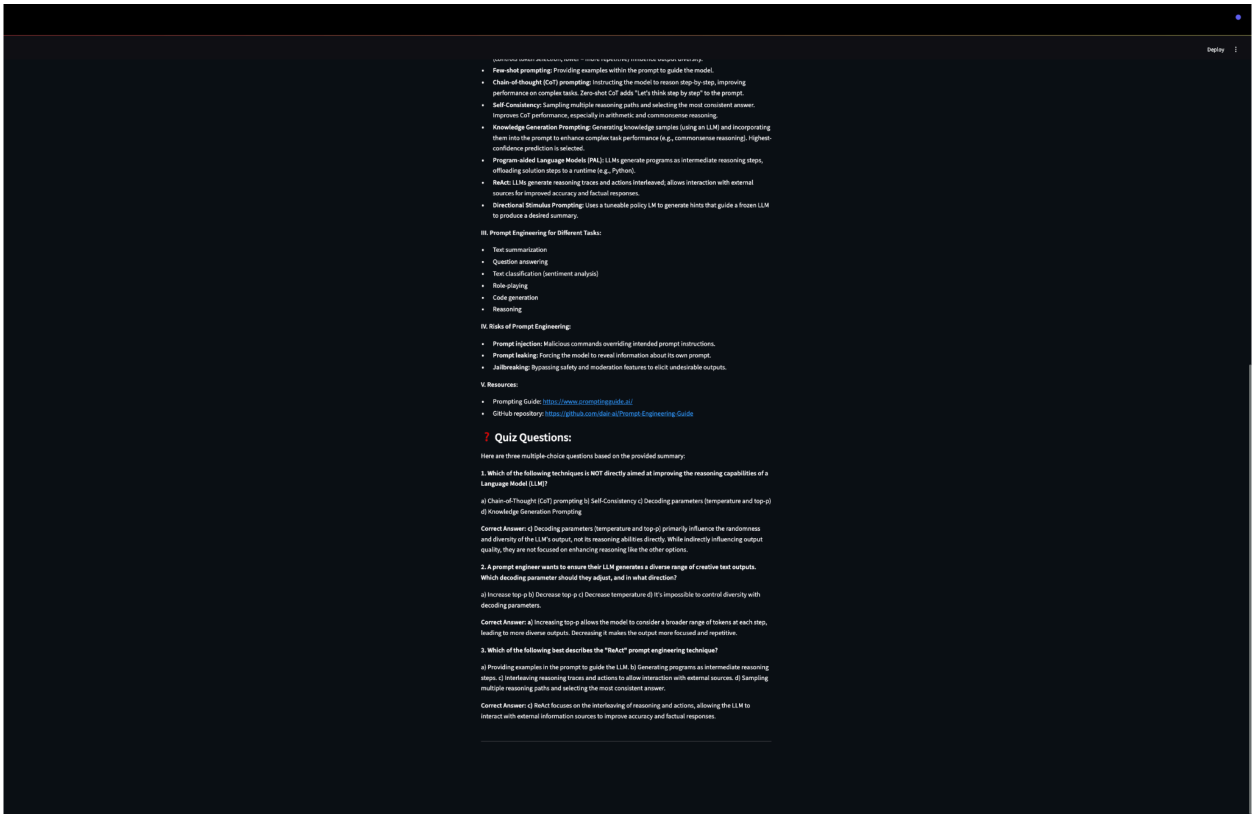
I. Introduction to Prompt Engineering:

- Prompt engineering is the practice of crafting effective prompts (instructions and context) to elicit desired outputs from Language Models (LLMs).
- It's a crucial skill for AI engineers and researchers to optimize LLM usage across various applications.
- Prompts consist of instructions, context, input data, and an output indicator.

II. Advanced Prompt Engineering Techniques:

- **Decoding Parameters:** Temperature (controls randomness; lower = more repetitive) and top-p (controls token selection; lower = more repetitive) influence output diversity.
- **Few-shot prompting:** Providing examples within the prompt to guide the model.
- **Chain-of-thought (CoT) prompting:** Instructing the model to reason step-by-step, improving performance on complex tasks. Zero-shot CoT adds "Let's think step by step" to the prompt.
- **Self-Consistency:** Sampling multiple reasoning paths and selecting the most consistent answer. Improves CoT performance, especially in arithmetic and commonsense reasoning.
- **Knowledge Generation Prompting:** Generating knowledge samples (using an LLM) and incorporating them into the prompt to enhance complex task performance (e.g., commonsense reasoning). Highest-confidence prediction is selected.
- **Program-aided Language Models (PAL):** LLMs generate programs as intermediate reasoning steps, offloading solution steps to a runtime (e.g., Python).
- **ReAct:** LLMs generate reasoning traces and actions interleaved; allows interaction with external sources for improved accuracy and factual responses.
- **Directional Stimulus Prompting:** Uses a tuneable policy LM to generate hints that guide a frozen LLM to produce a desired summary.

III. Prompt Engineering for Different Tasks: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Few-shot prompting: Providing examples within the prompt to guide the model.
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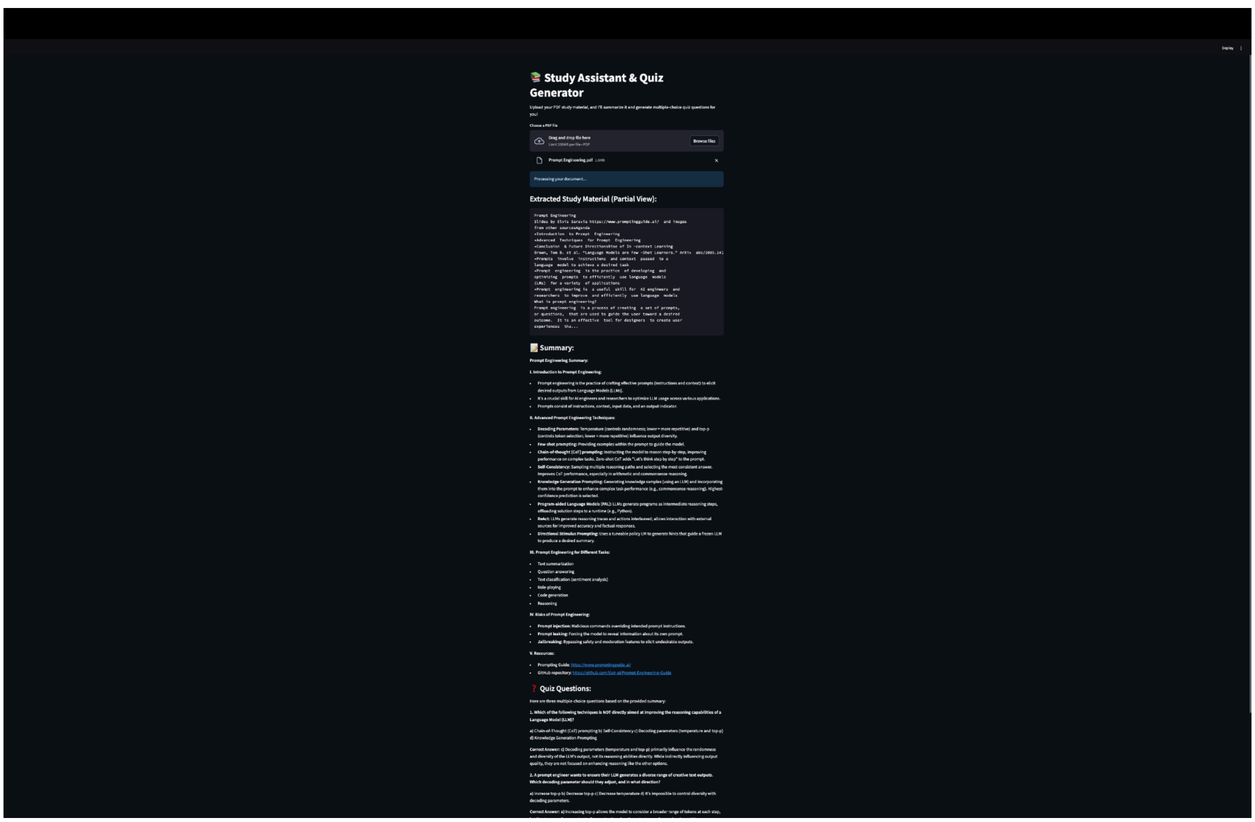
ReAct: LLMs generate reasoning traces and actions interleaved; allows interaction with external sources for improved accuracy and factual responses.
Directional Stimulus Prompting: Uses a tuneable policy LM to generate hints that guide a frozen LLM to produce a desired summary.
III. Prompt Engineering for Different Tasks:
Text summarization
Question answering
Text classification (sentiment analysis)
Role-playing
Code generation
Reasoning
IV. Risks of Prompt Engineering:
Prompt injection: Malicious commands overriding intended prompt instructions.
Prompt leaking: Forcing the model to reveal information about its own prompt.
Jailbreaking: Bypassing safety and moderation features to elicit undesirable outputs.
V. Resources:
Prompting Guide: https://www.promptingguide.ai/
GitHub repository: https://github.com/dair-ai/Prompt-Engineering-Guide
❓ Quiz Questions:
Here are three multiple-choice questions based on the provided summary:
1. Which of the following techniques is NOT directly aimed at improving the reasoning capabilities of a Language Model (LLM)?
a) Chain-of-Thought (CoT) prompting b) Self-Consistency c) Decoding parameters (temperature and top-p) d) Knowledge Generation Prompting
Correct Answer: c) Decoding parameters (temperature and top-p) primarily influence the randomness and diversity of the LLM's output, not its reasoning abilities directly. While indirectly influencing output quality, they are not focused on enhancing reasoning like the other options.
2. A prompt engineer wants to ensure their LLM generates a diverse range of creative text outputs. Which decoding parameter should they adjust, and in what direction?
a) Increase top-p b) Decrease top-p c) Decrease temperature d) It's impossible to control diversity with decoding parameters.
Correct Answer: a) Increasing top-p allows the model to consider a broader range of tokens at each step, leading to more diverse outputs. Decreasing it makes the output more focused and repetitive.
3. Which of the following best describes the "ReAct" prompt engineering technique?
a) Providing examples in the prompt to guide the LLM. b) Generating programs as intermediate reasoning steps. c) Interleaving reasoning traces and actions to allow interaction with external sources. d) Sampling multiple reasoning paths and selecting the most consistent answer.
Correct Answer: c) ReAct focuses on the interleaving of reasoning and actions, allowing the LLM to interact with external information sources to improve accuracy and factual responses.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II. Advanced Prompt Engineering Techniques:
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