WEEK 2

Advanced prompt engineering techniques

1. Zero-shot prompting

Description:

Zero-shot prompting is an **AI technique where models like GPT-3 perform tasks without examples**. This approach falls under zero-shot learning (ZSL), allowing models to tackle new tasks by leveraging their pre-trained knowledge, without needing any task-specific data.

APPLICATIONS:

Zero-shot prompting has a wide range of real-world applications. Some common examples include:

1. Translation – without needing a large set of translation examples, AI models can translate sentences between languages based solely on their training.

2. Sentiment analysis – ai can classify text sentiment, such as determining whether a review is positive or negative, based on prior training.

3. Summarization – models can summarize text or articles, processing important information into a short summary without needing example-based training.

EXAMPLE:

PROMPT: "WHAT IS THE TALLEST MOUNTAIN IN THE WORLD?"

AI OUTPUT: *MOUNT EVEREST*

2. Few-shot prompting

Description:

Few shot prompting is a **technique in artificial intelligence** (AI) where models like GPT-3 learn to perform tasks with very few examples reducing the need for large datasets.

Applications:

Few shot prompting has a wide range of real-world applications. Some common examples include:

1. Translation – AI models can translate text from one language to another after seeing only a few examples of translated sentences.

2. Chatbots – in customer service, chatbots can respond to queries by learning from a few sample conversations, allowing them to handle a variety of questions.

3. Summarization – models can summarize long documents or articles by being trained with a few example summaries.

Example:

Determine if each movie review is positive or negative.

Review: "i couldn't stop laughing throughout the film!"

Sentiment: positive

Review: "the plot was a complete mess and very boring."

Sentiment: negative

Review: "the cinematography was stunning and the story touched my heart."

Sentiment: positive

3. Chain of thought prompting

Description:

Chain-of-thought (cot) prompting is a **prompt engineering method** that breaks down bigger and more complex tasks into smaller, logical steps in order to find a solution. This approach mirrors how we think—tackling one step at a time to reach a clear answer.

Applications:

1. Math problem solving

In tasks that involve multi-step arithmetic or algebraic reasoning, such as solving equations, chain of thought prompting helps the model break down the problem step-by-step.

2. Commonsense reasoning

Cot is beneficial for tasks requiring reasoning based on common sense, where models must consider various factors and make decisions that seem intuitive to humans but may be complex for an AI system

3. Logical puzzles and games

Cot helps solve puzzles or games that require the model to explore different possibilities and steps. It's particularly useful for tasks where understanding the process is as important as the answer.

4. Story generation

When generating stories, chain of thought prompting can guide the AI through the logical progression of the plot, ensuring coherence and consistency throughout the story.

Example:

Q: if we have an array [1, 2, 3] and we reverse it, what will it become?
A: let me think step by step. The first element moves to last, and the last moves to first. So [1, 2, 3] reversed is [3, 2, 1].

Summary:

Zero-shot, few-shot, and chain of thought prompting are **different strategies to guide a large language model's responses**.

Zero-shot relies entirely on the model's existing knowledge.

Few-shot provides a small number of demonstrations to steer its answers.

Chain of thought lets the model show its reasoning step by step, improving accuracy on complex problems.

Together, these techniques help the model perform a **wide range of tasks more effectively**, depending on the context and difficulty of the question.