

Assignment 1 - LLM Usage

Few-Shot vs. Zero-Shot Prompting

Problem: Recommending Products Based on Preferences

Zero-shot prompt:

Recommend a suitable gift for a person who loves tech gadgets, enjoys photography, and is interested in fitness.

A great gift idea for someone who loves tech gadgets, enjoys photography, and is interested in fitness could be a **fitness smartwatch** with advanced features like heart rate tracking, GPS, and fitness tracking. Some models, such as the **Apple Watch Series** or **Garmin Forerunner**, also support photography-related features like controlling a camera remotely or integrating with fitness and health apps.

Alternatively, you could consider a **portable camera tripod** or a **smartphone lens kit** for enhanced photography experiences on the go. Pair it with a **wireless charging station** that can charge multiple devices (smartphone, smartwatch, camera) simultaneously. These gifts cater to their love of tech gadgets, photography, and fitness in a practical way.

Few-Shot Prompt:

Consider these examples of gift recommendations based on interests:
Example 1: A person who loves reading and enjoys cooking might like a cookbook or an e-reader with a collection of culinary books.
Example 2: A person who enjoys traveling and outdoor activities might appreciate a durable backpack or a portable power bank.
Now, recommend a suitable gift for a person who loves tech gadgets, enjoys photography, and is interested in fitness.

A suitable gift for someone who loves tech gadgets, enjoys photography, and is interested in fitness could be a **smartphone stabilizer/gimbal** for smooth, professional-looking photos and videos. This would enhance their photography experience while also supporting their fitness routine by enabling them to capture high-quality footage during outdoor activities or workouts. Additionally, a **fitness-focused action camera** like a **GoPro** could be a great choice for both photography and fitness enthusiasts, as it is compact, durable, and perfect for capturing action-packed moments during workouts or outdoor adventures.

Zero-Shot Prompting: The model performs a task without examples, relying on general knowledge.

Few-Shot Prompting: The model is given a few examples to guide its response, enhancing accuracy and relevance.

In essence, zero-shot is example-free, while few-shot uses examples for better results.

Problem: Solve $10 + 2 * 12$

Zero-shot prompt:

What is $10 + 2 * 12$

To solve $10 + 2 * 12$, let's apply the correct order of operations (PEMDAS: Parentheses, Exponents, Multiplication and Division (from left to right), Addition and Subtraction (from left to right)).

Step-by-step Solution:

1. First, perform the multiplication:

$$2 \times 12 = 24$$

2. Now, perform the addition:

$$10 + 24 = 34$$

Final Answer:

$$10 + 2 * 12 = 34.$$

Few-Shot Prompt:



Solve $10 + 2 * 12$

Use PEDMAS

Using the order of operations (PEMDAS), we solve:

1. First, multiply:

$$2 \times 12 = 24$$

2. Then, add:

$$10 + 24 = 34$$

So, the result is 34.

Chain-of-Thought (CoT) prompt:

Let's solve the arithmetic problem $10 + 2 * 12$ step by step.

Steps to be considered:

1. Identify the operations involved in the expression. We have addition and multiplication.
2. Apply the order of operations (PEMDAS), which tells us to perform multiplication first, before addition.

To solve the arithmetic problem $10 + 2 * 12$ step by step, let's follow the steps you've outlined:

Step 1: Identify the operations involved in the expression

- The given expression is $10 + 2 * 12$.
- We have **two operations**:
 1. **Addition**: $10 + \text{something}$
 2. **Multiplication**: 2×12

Step 2: Apply the order of operations (PEMDAS)

- According to **PEMDAS**, multiplication should be done before addition.
- So, we need to **multiply 2 and 12** first.

Step 3: Perform the multiplication

- Multiply 2 by 12:

$$2 \times 12 = 24$$

Step 4: Perform the addition

- Now, add the result of the multiplication (24) to 10:

$$10 + 24 = 34$$

Final Answer:

- The result of $10 + 2 * 12$ is **34**.

This step-by-step breakdown follows the **order of operations (PEMDAS)** to ensure the correct result.

Comparison of Zero-Shot, Few-Shot, and Chain-of-Thought Prompting

Zero-Shot Prompting

Definition: The model performs a task without any prior examples.

Example: Directly asking for the solution to ' $10 + 2 * 12$ '

Strengths: Quick and efficient; useful when no examples are available.

Limitations: May lack precision and context.

Few-Shot Prompting

Definition: The model is given a few examples to guide its response.

Example: Providing gift recommendations based on previous examples before asking for a tech-related gift.

Strengths: Increases accuracy by leveraging specific instances.

Limitations: Requires well-chosen examples; potential for incorrect generalization.

Chain-of-Thought (CoT) Prompting

Definition: The model is prompted to explain its reasoning step-by-step.

Example: Detailing the steps to solve ' $10 + 2 * 12$ ' through explicit reasoning.

Strengths: Enhances transparency and often leads to more accurate results.

Limitations: Can be more verbose and time-consuming.

In summary, zero-shot is efficient but less precise, few-shot enhances accuracy with examples, and chain-of-thought provides clarity through detailed reasoning.