

INTRODUCTION TO PROMPT ENGINEERING

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Outline

① OVERVIEW

② DEMO

③ CONCLUSIONS

Overview

Overview of Prompt Engineering

▶ Introduction

- ▶ Large Language Models (LLMs) differ from traditional ML models.
- ▶ LLMs provide unique insights without requiring retraining.

▶ Transformational Impact

- ▶ LLMs have catalyzed a transformative wave in programming.
- ▶ Enables effortless computer programming through simple text prompts.

▶ Prompt Engineering Technique

- ▶ Technique for directing LLM responses without altering model weights.
- ▶ Relies on strategic in-context prompting.
- ▶ Art of effectively communicating with AI for desired outcomes.

▶ Application Spectrum

- ▶ Applied across various tasks: question-answering, arithmetic reasoning, etc.
- ▶ Serves as a versatile tool to explore LLM boundaries and potentials.

Progression

Models for prediction:

- ▶ On data, derive features, put statistical techniques like regression. One model per task. That's Machine Learning.
- ▶ Feed raw data, employ neural networks. One model per task. That's Deep Learning.
- ▶ Use Text data, get embeddings, use ML/DL, say for classification. One model per task. That's Natural Language Processing.
- ▶ Train neural network on large corpus, store weights and architecture, then add final layers for say classification on custom data+labels. That's Pretrained model. One model, many tasks.
- ▶ Train Large Language Model, just supply instructions on what to do, works. One model many tasks. Zero-shot, few-shots.

(More info at SaaS LLM <https://medium.com/google-developer-experts/saasgpt-84ba80265d0f>)

New Programming Language?



Andrej Karpathy ✅
@karpathy

...

The hottest new programming language is English

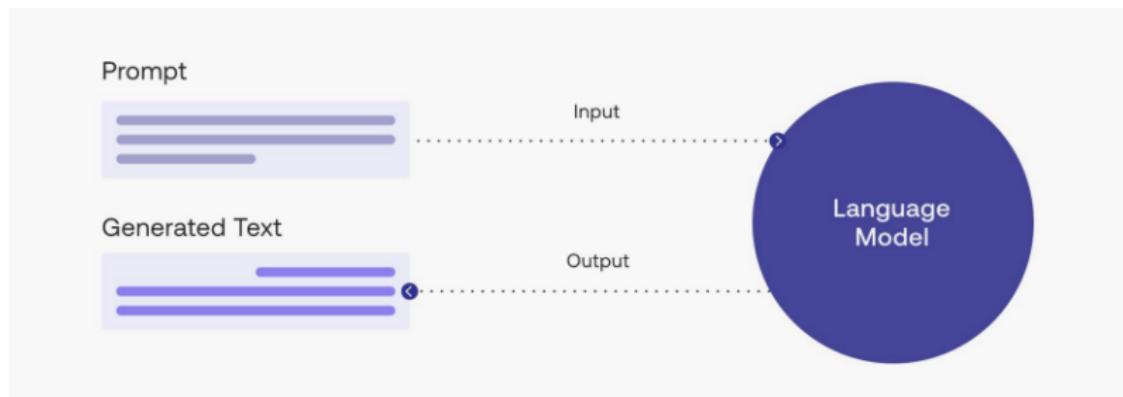
1:44 AM · Jan 25, 2023 · 1.9M Views

2,050 Retweets 284 Quote Tweets 17.9K Likes

(Ref: Prompt Engineering Sudalai Rajkumar)

What is Prompt Engineering?

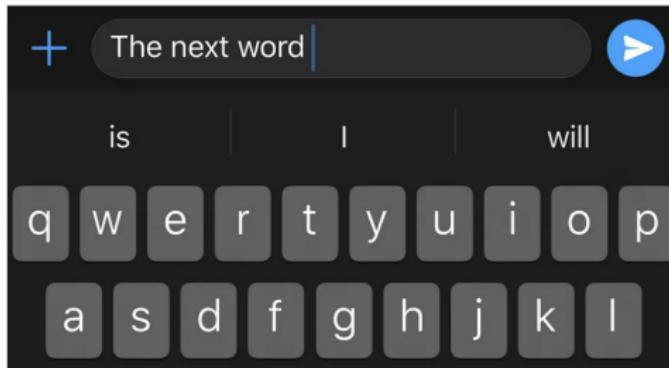
Prompt engineering is a NLP concept that involves discovering inputs that yield desirable or useful results



(Ref: Cohere <https://docs.cohere.ai/docs/prompt-engineering>)

What is a Language Models?

- ▶ While typing SMS, have you seen it suggests next word?
- ▶ While typing email, have you seen next few words are suggested?
- ▶ How does it suggest? (suggestions are not random, right?)
- ▶ In the past, for “Lets go for a . . .”, if you have typed ‘coffee’ 15 times, ‘movie’ say 4 times, then it learns that. Machine/Statistical Learning.
- ▶ Next time, when you type “Lets go for a ”, what will be suggested? why?
- ▶ This is called Language Model. Predicting the next word. When done continuously, one after other, it spits sentence, called Generative Model.



Next word prediction using language modeling in keyboards(Mandar Deshpande)

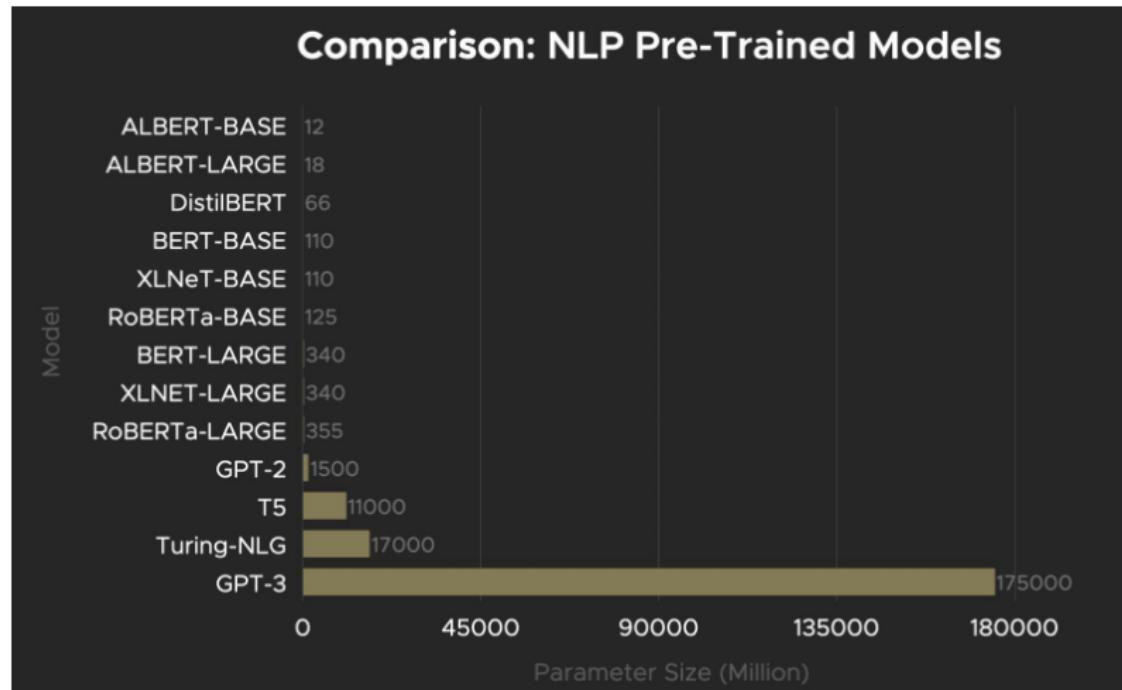
Evolution of Language Models

Language Models can be statistical (frequency based) or Machine/Deep Learning (supervised) based. Simple to complex.



(Ref: Analytics Vidhya <https://editor.analyticsvidhya.com/uploads/59483evolution.of.NLP.png>)

Large Language Models - Comparison



(Ref: Deus.ai <https://www.deus.ai/post/gpt-3-what-is-all-the-excitement-about>)

What is Prompt Engineering?

How to talk to AI to get it to do what you want



(Ref: Human Loop <https://humanloop.com/blog/prompt-engineering-101>)

What is Prompt Engineering?

But need to tell, for sure, else, nothing

Prompt Load model config ▾

No instruction →

English: How do you reset your password?
Spanish:

Para resetear tu contraseña, ve a la página de inicio de sesión de la aplicación y haz clic en el enlace "Olvidé mi contraseña". Se te enviará un correo electrónico con instrucciones para restablecer tu contraseña.

← Incorrect response

→ Incorrect response

(Ref: Human Loop <https://humanloop.com/blog/prompt-engineering-101>)

What is Prompt Engineering?

- ▶ For prompt `What is 1,000,000 * 9,000?` GPT-3 (text-davinci-002) (an AI) sometimes answers `9,000,000` (incorrect). This is where prompt engineering comes in.
- ▶ If, instead of asking `What is 1,000,000 * 9,000?`, we ask `What is 1,000,000 * 9,000?` Make sure to put the right amount of zeros, even `if` there are many:, GPT-3 will answer `9,000,000,000` (correct).
- ▶ Why is this the case? Why is the additional specification of the number of zeros necessary for the AI to get the right answer? How can we create prompts that yield optimal results on our task?
- ▶ That's Prompt Engineering.

(Ref: <https://learnprompting.org/docs/basics/prompting>)

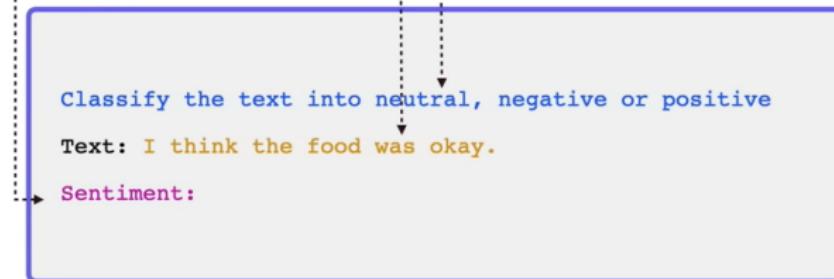
Components

YHK

Elements of Prompt

A prompt is composed of:

- Instructions
- Context
- Input data
- Output indicator



(Ref: Prompt Engineering Overview - Elvis Saravia)

Settings of Prompt

- ▶ 'temperature': before applying the softmax function, temperature is used to scale the logits. With it, creativity or variability is allowed. If you re-run the prompt, with 0, no change, but with 1, lots of variation. Default is 0.7. With a temperature between 0 and 1, we can control the randomness and creativity of the model's predictions. Temperature defines how likely it is to choose less probable words. $T=0$ gives the same response every time because there's a 0
- ▶ 'top_p' or 'nucleus sampling': specifies a sampling threshold during inference time, words passing the threshold are sampled for the output. Top-p goes for a minimal set of words, the probability of which does not exceed p. In practice, this means the following: if you choose reasonably high p, like 0.9, you would likely get a set of the most likely words for the model to choose from
- ▶ Like the temperature, the top p parameter controls the randomness and originality of the model.
- ▶ OpenAI documentation recommends using either one parameter or the other and setting the unused parameter to the neutral case, i.e. 1.0.

Example: Prompting by Instruction

S

write a reminder mail to customer on the upcoming home loan EMI



Subject: Reminder Regarding Your Upcoming Home Loan EMI

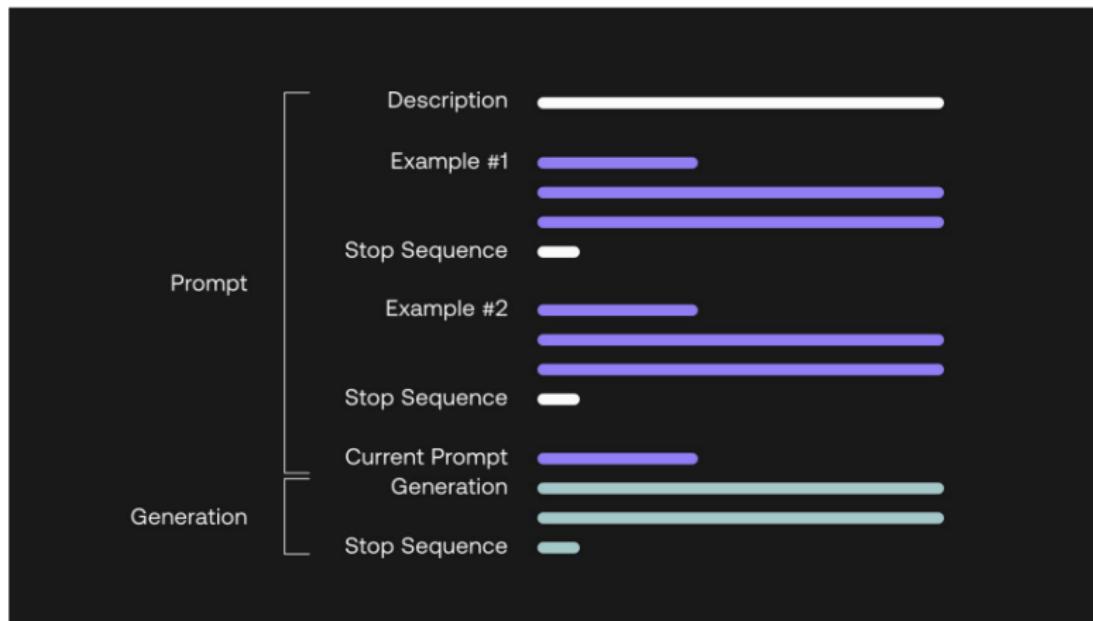
Dear [Customer Name],

I hope this email finds you in good health and spirits. This email is a friendly reminder regarding your upcoming home loan EMI.

As per our records, your next EMI is due on [due date]. The amount due is [EMI amount]. We would like to remind you to make the payment before the due date to avoid any late payment charges.

(Ref: Cohere <https://txt.cohere.ai/generative-ai-part-1/>)

Prompting by Examples



(Ref: Cohere <https://txt.cohere.ai/generative-ai-part-1/>)

Example: Prompting by Examples

S

Text: I am happy with the service

Sentiment: Positive

Text: The service was not up to the mark.

Sentiment:



Negative

(Ref: Cohere <https://txt.cohere.ai/generative-ai-part-1/>)

Length Control

Specify a desired word count or character count as part of the prompt

S

Write a 150 word summary on UPI



UPI (Unified Payments Interface) is an innovative, instant payment system developed by the National Payments Corporation of India (NPCI). It enables instant money transfer

(Ref: Prompt Engineering Sudalai Rajkumar)

Tone Control

Specify specific words or phrases that indicate the desired tone

S

Write a **polite response** for the below chat

Customer: This is your fault. How many days should I wait for the refund?

Agent:



I apologize for the inconvenience caused. Can you please provide me with some more details about the issue, so I can assist you with the refund process? Thank you for your understanding and patience.

(Ref: Prompt Engineering Sudalai Rajkumar)

Style Control

Specify the desired writing style.

S

Write a short mail to the banking customer with their last weeks transactions as a table and the number of transactions and total as bullet points



Subject: Your Recent Transactions

Dear [Customer Name],

I hope this email finds you well. This email is to provide you with the details of your recent transactions.

Please find below a table summarizing your transactions from [date range]:

Date	Description	Amount
[date 1]	[description 1]	[amount 1]
[date 2]	[description 2]	[amount 2]
[date 3]	[description 3]	[amount 3]

In summary:

- Total number of transactions: [number of transactions]
- Total amount: [total amount]

(Ref: Prompt Engineering Sudalai Rajkumar)

Audience Control

Specify the desired audience.

S

Explain internet banking to a 8 year old kid



Internet banking is like using a magic bank that you can access from anywhere in the world, as long as you have a computer or a smartphone. It's a way to do banking tasks like checking your balance, paying bills, or sending money to your friends and family, all from the comfort of your own home.

(Ref: Prompt Engineering Sudalai Rajkumar)

Context Control

Specify the information about the context.

S

Write an reminder message to the customer whose home loan EMI is due tomorrow



Dear [Customer Name],

This is a friendly reminder that your Home Loan EMI of INR [Amount] is due tomorrow. We value your partnership with us and want to ensure that your loan repayment is smooth and seamless.

We request you to kindly make the payment before the due date to avoid any late payment charges. You can make the payment through internet banking, mobile banking, auto-debit, or by visiting any of our branches.

(Ref: Prompt Engineering Sudalai Rajkumar)

Calling of Prompt

```
import openai
2 import os
4
from dotenv import load_dotenv, find_dotenv
_ = load_dotenv(find_dotenv())
6
openai.api_key = os.getenv('OPENAI_API_KEY') # for langchain it does it
    automatically
8
def get_completion(prompt, model="gpt-3.5-turbo"):
10    messages = [{"role": "user", "content": prompt}]
    response = openai.ChatCompletion.create(
12        model=model,
        messages=messages,
14        temperature=0, # this is the degree of randomness of the model's output
    )
16    return response.choices[0].message["content"]
```

Principles

- ▶ Give clear and specific instructions
- ▶ Give the model time to “think”

(Ref: ChatGPT Prompt Engineering for Developers - Deep Learning AI)

Techniques of Prompts

YHK

Understanding Prompts in Prompt Engineering

▶ **Definition of Prompts**

- ▶ Prompts are initial text inputs provided to a model.
- ▶ Used by the model to generate responses or accomplish tasks.

▶ **Role of Prompts**

- ▶ Sets of instructions for AI or chatbots (e.g., ChatGPT).
- ▶ Applied in various tasks, including summarization, arithmetic problem-solving, and question-answering.

▶ **Objective of Prompt Engineering**

- ▶ Goal: Refine prompts to enhance model accuracy and relevance in outputs.
- ▶ Central to improving the performance of language models.

▶ **Prevalent Prompt Types**

- ▶ Various prompt types exist, with a focus on two widely used methodologies:
 - ▶ Zero-shot prompting
 - ▶ Few-shot prompting

Zero-shot Prompting

► Definition

- Zero-shot learning: Task given to the model without specific output examples.
- No prior examples indicating the desired output.

► Example Scenario

- Input: A sentence without examples.
- Task: Model predicts sentiment of the given sentence.

► Illustrative Example (DAIR-AI)

- **Prompt:** Classify the text into neutral, negative, or positive.
- **Text:** I think the vacation is okay.
- **Output:** Neutral

Few-shot Prompting

► **Definition**

- Few-shot learning: Model provided with a small number of quality examples (input and desired output).
- Helps the model better understand human intention and criteria for accurate outputs.

► **Comparison with Zero-shot Learning**

- Few-shot learning often yields better performance compared to zero-shot learning.
- However, may consume more tokens and encounter context length limitations for long input/output text.

► **Application in Large Language Models (e.g., GPT-3)**

- LLMs excel in zero-shot capabilities but may face performance issues in complex tasks.
- Few-shot learning enhances performance by offering in-context learning through task-specific examples.

Few-shot Prompting

► Example Scenario (Brown et al.)

► Prompt:

- A "whatpu" is a small, furry animal native to Tanzania.
- Example sentence: We were traveling in Africa and we saw these very cute whatpus.
- To do a "farduddle" means to jump up and down really fast.
- Example sentence: When we won the game, we all started to farduddle in celebration.

► Output:

- The model, given one example, generates the answer for the next.

Chain-of-Thought (CoT) Prompting

► Introduction

- CoT Prompting introduced in Wei et al. (2022).
- Enables LLM to tackle complex tasks by breaking them down into constituent steps.
- Complex reasoning through intermediate reasoning steps.

► Combining with Few-shot Prompting

- Combine with few-shot prompting for better results on complex tasks.
- Requires reasoning before responding.

Chain-of-Thought (CoT) Prompting

Example Scenario: Prompt:

The odd numbers `in` this group add up to an even number: 4, 8, 9, 15, 12, 2, 1.

2 A: Adding `all` the odd numbers (9, 15, 1) gives 25. The answer `is` False.

4 The odd numbers `in` this group add up to an even number: 17, 10, 19, 4, 8, 12, 24.

A: Adding `all` the odd numbers (17, 19) gives 36. The answer `is` True.

6 The odd numbers `in` this group add up to an even number: 16, 11, 14, 4, 8, 13, 24.

8 A: Adding `all` the odd numbers (11, 13) gives 24. The answer `is` True.

10 The odd numbers `in` this group add up to an even number: 17, 9, 10, 12, 13, 4, 2.

A: Adding `all` the odd numbers (17, 9, 13) gives 39. The answer `is` False.

12 The odd numbers `in` this group add up to an even number: 15, 32, 5, 13, 82, 7, 1.

14 A:

16 Adding `all` the odd numbers (15, 5, 13, 7, 1) gives 41. The answer `is` False.
Wow! We can see a perfect result when we provided the reasoning step.

18 In fact, we can solve this task by providing even fewer examples, i.e., just one example seems enough:



Chain-of-Thought (CoT) Prompting (Contd.)

Standard Prompting

Model Input

Q: Roger has 5 tennis balls. He buys 2 more cans of tennis balls. Each can has 3 tennis balls. How many tennis balls does he have now?

A: The answer is 11.

Q: The cafeteria had 23 apples. If they used 20 to make lunch and bought 6 more, how many apples do they have?

Model Output

A: The answer is 27.

Chain-of-Thought Prompting

Model Input

Q: Roger has 5 tennis balls. He buys 2 more cans of tennis balls. Each can has 3 tennis balls. How many tennis balls does he have now?

A: Roger started with 5 balls. 2 cans of 3 tennis balls each is 6 tennis balls. $5 + 6 = 11$. The answer is 11.

Q: The cafeteria had 23 apples. If they used 20 to make lunch and bought 6 more, how many apples do they have?

Model Output

A: The cafeteria had 23 apples originally. They used 20 to make lunch. So they had $23 - 20 = 3$. They bought 6 more apples, so they have $3 + 6 = 9$. The answer is 9.

(Ref: Primers • Prompt Engineering - Aman AI)

Chain-of-Thought (CoT) Prompting (Contd.)

Example Scenario (Continued): Prompt:

The odd numbers `in` this group add up to an even number: 4, 8, 9, 15, 12, 2, 1.
2 A: Adding `all` the odd numbers (9, 15, 1) gives 25. The answer `is` False.

4 The odd numbers `in` this group add up to an even number: 15, 32, 5, 13, 82, 7,
1.
A:
6
8 Adding `all` the odd numbers (15, 5, 13, 7, 1) gives 41. The answer `is` False.
Keep `in` mind that the authors claim that this `is` an emergent ability that
arises with sufficiently large language models.

Zero-shot CoT Prompting

(a) Few-shot

Q: Roger has 5 tennis balls. He buys 2 more cans of tennis balls. Each can has 3 tennis balls. How many tennis balls does he have now?
A: The answer is 11.

Q: A juggler can juggle 16 balls. Half of the balls are golf balls, and half of the golf balls are blue. How many blue golf balls are there?

A:

(Output) The answer is 8. X

(b) Few-shot-CoT

Q: Roger has 5 tennis balls. He buys 2 more cans of tennis balls. Each can has 3 tennis balls. How many tennis balls does he have now?

A: Roger started with 5 balls. 2 cans of 3 tennis balls each is 6 tennis balls. $5 + 6 = 11$. The answer is 11.

Q: A juggler can juggle 16 balls. Half of the balls are golf balls, and half of the golf balls are blue. How many blue golf balls are there?

A:

(Output) The juggler can juggle 16 balls. Half of the balls are golf balls. So there are $16 / 2 = 8$ golf balls. Half of the golf balls are blue. So there are $8 / 2 = 4$ blue golf balls. The answer is 4. ✓

(c) Zero-shot

Q: A juggler can juggle 16 balls. Half of the balls are golf balls, and half of the golf balls are blue. How many blue golf balls are there?

A: The answer (arabic numerals) is

(Output) 8 X

(d) Zero-shot-CoT (Ours)

Q: A juggler can juggle 16 balls. Half of the balls are golf balls, and half of the golf balls are blue. How many blue golf balls are there?

A: Let's think step by step.

(Output) There are 16 balls in total. Half of the balls are golf balls. That means that there are 8 golf balls. Half of the golf balls are blue. That means that there are 4 blue golf balls. ✓

(Ref: Primers • Prompt Engineering - Aman AI)

Zero-shot CoT Prompting

- ▶ Zero-shot CoT introduced by Kojima et al. (2022).
- ▶ Involves appending "Let's think step by step" to the prompt.
- ▶ Aims to improve model performance.

Illustrative Example: Prompt:

```
1 I went to the market and bought 10 apples. I gave 2 apples to the neighbor and
   2 to the repairman.
I then went and bought 5 more apples and ate 1. How many apples did I remain
   with?
3
11 apples
```

Zero-shot CoT Prompting

Special Prompt Example: Prompt:

- I went to the market **and** bought 10 apples. I gave 2 apples to the neighbor **and** 2 to the repairman.
- 2 I then went **and** bought 5 more apples **and** ate 1. How many apples did I remain with?
- 4 Let's think step by step.
- 6 First, you started with 10 apples.
You gave away 2 apples to the neighbor and 2 to the repairman, so you had 6 apples left.
- 8 Then you bought 5 more apples, so now you had 11 apples.
Finally, you ate 1 apple, so you would remain with 10 apples.

Zero-shot CoT Prompting

► Overview

- CoT prompting generates reasoning chains without additional training.
- Sequence of short sentences with an explanation and prediction pair.
- No need for extra training or fine-tuning.

► Benefits

- Step-by-step reasoning logic leading to the final answer.
- Particularly beneficial for complex reasoning tasks and larger models.

Few-shot CoT Prompting

Few-shot CoT allows the model to view a few demonstrations of high-quality reasoning chains.

Example Scenarios

1 Question 1:

Tom **and** Elizabeth have a competition to climb a hill.

3 Elizabeth takes 30 minutes to climb the hill.

Tom takes four times as **long** as Elizabeth does to climb the hill.

5 How many hours does it take Tom to climb up the hill?

7 Answer 1:

9 It takes Tom $30 * 4 = <<30*4=120>>120$ minutes to climb the hill.

It takes Tom $120 / 60 = <<120/60=2>>2$ hours to climb the hill.

11 So the answer **is** 2.

Few-shot CoT Prompting

Question 2:

- 2 Jack **is** a soccer player. He needs to buy two pairs of socks **and** a pair of soccer shoes.
Each pair of socks cost \$9.50, **and** the shoes cost \$92.
4 Jack has \$40. How much more money does Jack need?

6 Answer 2:

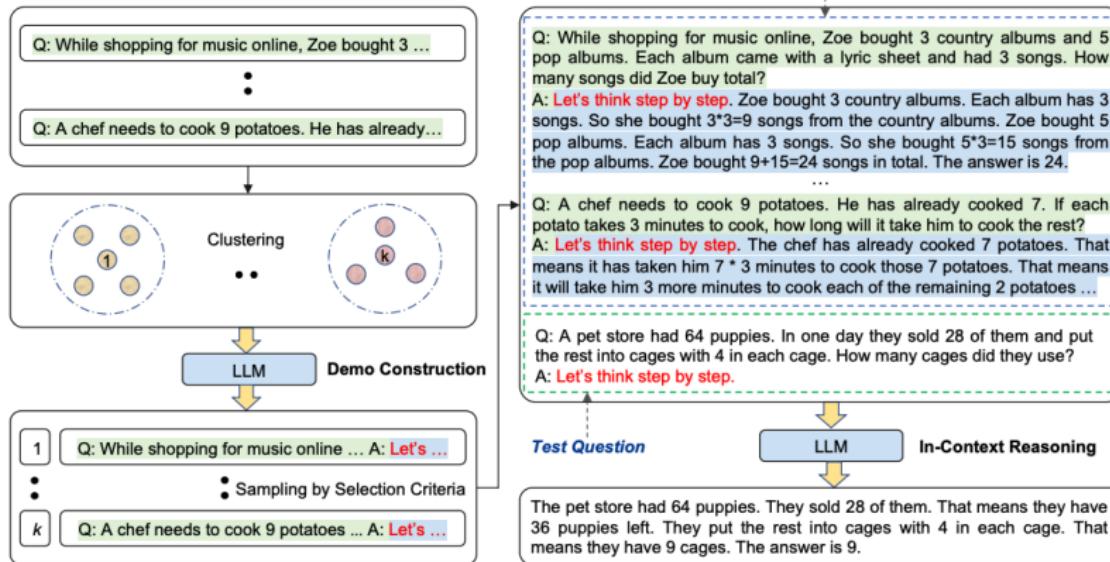
- The total cost of two pairs of socks **is** $\$9.50 \times 2 = \19 .
8 The total cost of the socks **and** the shoes **is** $\$19 + \$92 = \$111$.
Jack needs $\$111 - \$40 = \$71$ more.
10 So the answer **is** 71.

12 Question 3:

- Marty has 100 centimeters of ribbon that he must cut into 4 equal parts.
14 Each of the cut parts must be divided into 5 equal parts.
How **long** will each final cut be?

16 Answer 3:

Automatic Chain-of-Thought (Auto-CoT)



(Ref: Primers • Prompt Engineering - Aman AI)

Automatic Chain-of-Thought (Auto-CoT)

▶ Introduction

- ▶ Applying chain-of-thought prompting with demonstrations involves hand-crafting examples, which can be suboptimal.
- ▶ Zhang et al. (2022) propose Auto-CoT to eliminate manual efforts by leveraging LLMs.
- ▶ Uses the "Let's think step by step" prompt to generate reasoning chains for demonstrations automatically.

▶ Automatic Process

- ▶ Automatic process may still have mistakes in generated chains.
- ▶ Diversity of demonstrations is crucial to mitigate the effects of mistakes.

▶ Auto-CoT Stages

- ▶ **Stage 1: Question Clustering**
 - ▶ Partition questions of a given dataset into a few clusters.
- ▶ **Stage 2: Demonstration Sampling**
 - ▶ Select a representative question from each cluster.
 - ▶ Generate its reasoning chain using Zero-Shot-CoT with simple heuristics.

▶ Simple Heuristics

- ▶ Length of questions (e.g., 60 tokens).
- ▶ Number of steps in rationale (e.g., 5 reasoning steps).
- ▶ Encourages the model to use simple and accurate demonstrations.

Applications of Prompts

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Text Generation

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LLMs are



Language models (LMs), also known as Large language models (LLMs), are artificial intelligence models that are trained to generate text that is similar to human language. They are trained on vast amounts of text data and can generate coherent text, perform question answering, translation, and many other NLP tasks. The most famous LLMs currently are GPT-3 (Generative Pre-trained Transformer-3) developed by OpenAI.

(Ref: Prompt Engineering Sudalai Rajkumar)

Text Classification

S

Classify the following text into one of the classes - credit card, internet banking, others

Text: I was not able to log into the banks website

Answer:



Internet Banking

(Ref: Prompt Engineering Sudalai Rajkumar)

Text Translation

S

Translate the following to tamil

I made a transaction yesterday



"நான் நேற்று ஒரு பரிவர்த்தனை செய்தது"

(Ref: Prompt Engineering Sudalai Rajkumar)

Text Comprehension

S

Context: The Reserve Bank of India (RBI) on Wednesday hiked the repo rate by 25 basis points (bps) to 6.50 percent by a majority of 4-2. The three-day meeting of the Monetary Policy Committee (MPC) started on Monday.

Question: What is the new interest rate?

Answer:



The new interest rate is 6.50 percent.

(Ref: Prompt Engineering Sudalai Rajkumar)

Text Summarization

S

Summarize the below paragraph in less than 15 words

The RBI announced a hike of 25 basis points in the repo rate on February 8, as envisaged by many experts earlier. The move is aimed at containing inflationary pressures in the economy, with a high-interest-rate regime. The MPC has taken note of the moderation in headline consumer inflation numbers in recent times. However, it highlighted various risks that may keep inflation elevated, including global commodity prices.



RBI hikes repo rate 25 bps to control inflation, despite moderating consumer inflation.

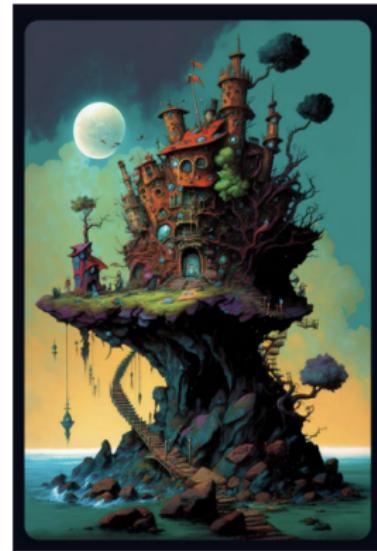
(Ref: Prompt Engineering Sudalai Rajkumar)

Image Generation

/v4-upscale 12 hrs ago

A surreal castle on a floating island, by John Byrne and Skottie young and Greg Smallwood, highly...

moongoat ...



(Ref: Prompt Engineering Sudalai Rajkumar)

Models / Tools: Dall-E , Midjourney, Stable Diffusion

For generating code using Codex

Provide Codex with a prompt consisting of the following:

- ▶ High level task description: Tell the model to use a helpful tone when outputting natural language
- ▶ High level context: Describe background information like API hints and database schema to help the model understand the task
- ▶ Examples: Show the model examples of what you want
- ▶ User input: Remind the model what the user has said before

(Ref: <https://microsoft.github.io/prompt-engineering/>)

Making of a Sandwich

YHK

Basic

Explain how to make a peanut butter and jelly sandwich

Adding Roles

As a chef, explain to your assistant how to make a peanut butter and jelly sandwich

YHK

Adding Constraints

Make a nut-free version of the sandwich due to a customer's nut allergy

Adding Examples

Create two unique variations of the classic sandwich. Banana Nut Crunch: . . .

Triple Berry Blast: . . .



Adding Contextual Information

As the head chef at 'The Sandwich Haven,' guide your new assistant to create specials for the menu

Incorporating Feedback

Improve the sandwich based on customer feedback for less sweetness and a creative twist

Time Constraints and Prioritization

Prepare an alternative fruit version for testing within a tight deadline

Incorporating Multidisciplinary Knowledge

Use food presentation and garnishing techniques for a visually appealing sandwich



Addressing Dietary Preferences

Prepare a vegan version using plant-based alternatives for all ingredients

Reflection and Iteration

Reflect on feedback and iteratively refine the sandwich for better taste and appeal

Self-Criticism

Explain how to make a peanut butter and jelly sandwich. Please re-read your above response. Any mistakes? If so, please identify and make the necessary edits.

Chain-of-Thought

Explain how to make a peanut butter and jelly sandwich. Let's think step by step.

Self-Consistency

Here are recipes of multiple sandwiches. Sandwich 1: recipe 1. Sandwich 2: recipe 2. Explain how to make a peanut butter jelly sandwich.

Conclusions

YHK

ChatGPT Ultimate Prompting Guide

- ▶ Tone: Specify the desired tone (e.g., formal, casual, informative, persuasive).
- ▶ Format: Define the format or structure (e.g., essay, bullet points, outline, dialogue).
- ▶ Act as: Indicate a role or perspective to adopt (e.g., expert, critic, enthusiast).
- ▶ Objective: State the goal or purpose of the response (e.g., inform, persuade, entertain).
- ▶ Context: Provide background information, data, or context for accurate content generation.
- ▶ Scope: Define the scope or range of the topic.
- ▶ Keywords: List important keywords or phrases to be included.
- ▶ Limitations: Specify constraints, such as word or character count.
- ▶ Examples: Provide examples of desired style, structure, or content.
- ▶ Deadline: Mention deadlines or time frames for time-sensitive responses.

(Ref: LinkedIn post by Generative AI, Twitter by Aadit Sheth, Source : Reddit)



ChatGPT Ultimate Prompting Guide

- ▶ Audience: Specify the target audience for tailored content.
- ▶ Language: Indicate the language for the response, if different from the prompt.
- ▶ Citations: Request inclusion of citations or sources to support information.
- ▶ Points of view: Ask the AI to consider multiple perspectives or opinions.
- ▶ Counter arguments: Request addressing potential counterarguments.
- ▶ Terminology: Specify industry-specific or technical terms to use or avoid.
- ▶ Analogies: Ask the AI to use analogies or examples to clarify concepts.
- ▶ Quotes: Request inclusion of relevant quotes or statements from experts.
- ▶ Statistics: Encourage the use of statistics or data to support claims.
- ▶ Visual elements: Inquire about including charts, graphs, or images.
- ▶ Call to action: Request a clear call to action or next steps.
- ▶ Sensitivity: Mention sensitive topics or issues to be handled with care or avoided.

(Ref: LinkedIn post by Generative AI, Twitter by Aadit Sheth, Source : Reddit)



Interaction Guidelines: Avoid Misuses

- ▶ Factual Accuracy: Interactions must be free from factual inaccuracies that can be challenged by social media or journalists.
- ▶ Negative Debates: Avoid discussing topics that fuel negative or concerning online debates, such as AI sentience, AI in education, AI-driven job displacements, and politically divisive issues.
- ▶ Minors' Involvement: Do not include use cases specifically targeting or involving individuals under 18 years old.
- ▶ Sensitivity and Misinformation: Prevent the inclusion of sensitive, misleading, or hazardous responses.
- ▶ Search and Google Assistant: Interactions that require basic, straightforward answers are better suited for Search or Google Assistant.
- ▶ Financial/Legal/Medical Advice: Refrain from providing advice related to financial matters, legal issues, or medical concerns.
- ▶ Brand Names and Trademarks: Avoid mentioning specific brand names, trademarks, or public figures (except historical figures).
- ▶ No Reviews or Tweets: Do not request reviews of restaurants, businesses, or tweets to minimize the risk of associating with bots.
- ▶ Avoid Personification: Refrain from personifying the product or brand and from encouraging users to address Bard by name.

Limitations

Boie is a real company, the product name is not real. So, see what you get ...

```
1 prompt = f"""
2 Tell me about AeroGlide UltraSlim Smart Toothbrush by Boie
3 """
4
5 response = get_completion(prompt)
6 print(response)
```

The Career of the Future

Software 3.0

“Programming [is] moving from curating datasets to curating prompts to make the meta learner “get” the task it’s supposed to be doing.”

Source: [@karpathy](#)



(Ref: The Complete Prompt Engineering for AI Bootcamp (2023))

New Roles?

Coming up with good prompt is a combination of art and science



Alexandr Wang @alexandr_wang

...

Today, [@goodside](#) joined [@scale_AI](#) as a Staff Prompt Engineer.

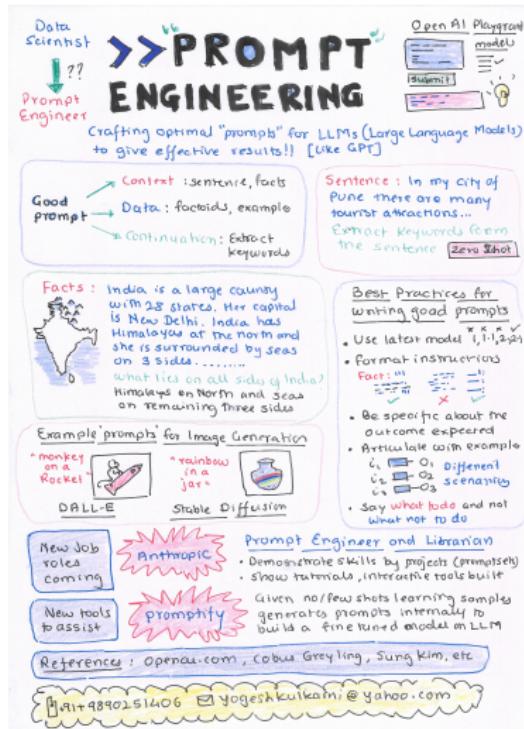
I am going to assert that Riley is the first Staff Prompt Engineer hired *anywhere*.

(Ref: Prompt Engineering Sudalai Rajkumar)

Read on to learn how to engineer good prompts!

- ▶ Shin, T., Razeghi, Y., Logan IV, R. L., Wallace, E., & Singh, S. (2020). AutoPrompt: Eliciting Knowledge from Language Models with Automatically Generated Prompts. Proceedings of the 2020 Conference on Empirical Methods in Natural Language Processing (EMNLP).
<https://doi.org/10.18653/v1/2020.emnlp-main.346>
- ▶ Kojima, T., Gu, S. S., Reid, M., Matsuo, Y., & Iwasawa, Y. (2022). Large Language Models are Zero-Shot Reasoners.
- ▶ Liu, P., Yuan, W., Fu, J., Jiang, Z., Hayashi, H., & Neubig, G. (2022). Pre-train, Prompt, and Predict: A Systematic Survey of Prompting Methods in Natural Language Processing. ACM Computing Surveys.
<https://doi.org/10.1145/3560815>
- ▶ Brown, T. B., Mann, B., Ryder, N., Subbiah, M., Kaplan, J., Dhariwal, P., Neelakantan, A., Shyam, P., Sastry, G., Askell, A., Agarwal, S., Herbert-Voss, A., Krueger, G., Henighan, T., Child, R., Ramesh, A., Ziegler, D. M., Wu, J., Winter, C., ... Amodei, D. (2020). Language Models are Few-Shot Learners.
- ▶ Zhao, T. Z., Wallace, E., Feng, S., Klein, D., & Singh, S. (2021). Calibrate Before Use: Improving Few-Shot Performance of Language Models.

My Sketchnote



(Ref: <https://medium.com/technology-hits/prompting-is-all-you-need-5dddb82bd022>)

Take Aways

Prompt Engineering is an Iterative Process:

- ▶ Try something
- ▶ Analyze where the results do not match the expectations
- ▶ Clarify instructions, gives examples, specify output format, specify constraints, etc
- ▶ Test on a batch of known results.

Quality of Ideas

"I don't think we'll still be doing prompt engineering in five years [i.e.] figuring out how to hack the prompt by adding one **magic word** to the end that changes everything else."

"What will always matter is the **quality of ideas** and the understanding of what you want."

Source: [Sam Altman](#)

(Ref: The Complete Prompt Engineering for AI Bootcamp (2023))

Resources

- ▶ Prompt Engineering Guide
<https://github.com/dair-ai/Prompt-Engineering-Guide>
- ▶ Awesome ChatGPT Prompts
<https://github.com/f/awesome-chatgpt-prompts/>
- ▶ ChatGPT Prompt Engineering for Developers - Deep Learning AI
- ▶ Learn Prompting <https://learnprompting.org/docs/intro>
- ▶ Types of Prompts with Practical examples - Dr. Naveed Siddiqui
- ▶ AI Prompt Database
<https://justunderstandingdata.notion.site/d98dcc9a6736471584d53cc8b2a5c30d?v>

Thanks ...

- ▶ Search "**Yogesh Haribhau Kulkarni**" on Google and follow me on LinkedIn and Medium
- ▶ Office Hours: Saturdays, 2 to 5pm (IST); Free-Open to all; email for appointment.
- ▶ Email: yogeshkulkarni at yahoo dot com



(Generated by Hugging Face QR-code-AI-art-generator,
with prompt as "Follow me")