

Part 1

Introduction to Prompt Engineering

What are prompts?

- **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 that are easy to use and intuitive. This method is often used in interactive design and software development, as it allows users to easily understand how to interact with a system or product..

Why Prompt Engineering?

- Why learn prompt engineering?
 - Important for research, discoveries, and advancement
 - Helps to test and evaluate the limitations of LLMs
 - Enables all kinds of innovative applications on top of LLMs

ANTHROPIC

Prompt Engineer and Librarian

SAN FRANCISCO, CA / PRODUCT / FULL-TIME / HYBRID

APPLY FOR THIS JOB

Anthropic's mission is to create reliable, interpretable, and steerable AI systems. We want AI to be safe for our customers and for society as a whole.

Anthropic's AI technology is amongst the most capable and safe in the world. However, large language models are a new type of intelligence, and the art of instructing them in a way that delivers the best results is still in its infancy — it's a hybrid between programming, instructing, and teaching. You will figure out the best methods of prompting our AI to accomplish a wide range of tasks, then document these methods to build up a library of tools and a set of tutorials that allow others to learn prompt engineering or simply find prompts that would be ideal for them.

Compensation and Benefits*

Anthropic's compensation package consists of three elements: salary, equity, and benefits. We are committed to pay fairness and aim for these three elements collectively to be highly competitive with market rates.

Salary - The expected salary range for this position is \$250k - \$335k.

Equity - Equity will be a major component of the total compensation for this position. We aim to offer higher-than-average equity compensation for a company of our size, and communicate equity amounts at the time of offer issuance.

Source: <https://jobs.lever.co/Anthropic/e3cde481-d446-460f-b576-93cab67bd1ed>

First Basic Prompt

Instruction

The sky is

blue

The sky is a beautiful blue color during the day. The blue of the sky is created by the Earth's atmosphere scattering the sun's light. The blue is a result of the air molecules in the atmosphere reflecting the shorter wavelength of blue light back to our eyes.

Response

Model: "text-davinci-003"
temperature: 0.7
top-p: 1

Elements of a Prompt

- A prompt is composed with the following components:

- Instructions
- Context
- Input data
- Output indicator

Classify the text into neutral, negative or positive

Text: I think the food was okay.

Sentiment:

Settings to keep in mind

- When prompting a language model you should keep in mind a few settings
- You can get very different results with prompts when using different settings
- One important setting is controlling how deterministic the model is when generating completion for prompts
 - **Temperature** and **top_p** are two important parameters to keep in mind
 - Generally, keep these low if you are looking for exact answers
 - ...keep them high if you are looking for more diverse responses

Designing Prompts for Different Tasks

- In the next few slides, we will cover a few examples of common tasks using different prompts
- Tasks covered:
 - Text Summarization
 - Question Answering
 - Text Classification
 - Role Playing
 - Code Generation
 - Reasoning

Text Summarization

Context

Antibiotics are a type of medication used to treat bacterial infections. They work by either killing the bacteria or preventing them from reproducing, allowing the body's immune system to fight off the infection.

Antibiotics are usually taken orally in the form of pills, capsules, or liquid solutions, or sometimes administered intravenously. They are not effective against viral infections, and using them inappropriately can lead to antibiotic resistance.

Instruction

Explain the above in one sentence:

Antibiotics are medications used to treat bacterial infections by either killing the bacteria or stopping them from reproducing, but they are not effective against viruses and overuse can lead to antibiotic resistance.

Question Answering

Answer the question based on the context below. Keep the answer short and concise. Respond "Unsure about answer" if not sure about the answer.

Context: Teplizumab traces its roots to a New Jersey drug company called Ortho Pharmaceutical. There, scientists generated an early version of the antibody, dubbed OKT3. Originally sourced from mice, the molecule was able to bind to the surface of T cells and limit their cell-killing potential. In 1986, it was approved to help prevent organ rejection after kidney transplants, making it the first therapeutic antibody allowed for human use.

Question: What was OKT3 originally sourced from?

Answer: Mice.

Text Classification

Classify the text into neutral, negative or positive.

Text: I think the food was okay.

Sentiment: Neutral

Role Playing

The following is a conversation with an AI research assistant. The assistant tone is technical and scientific.

Human: Hello, who are you?

AI: Greeting! I am an AI research assistant. How can I help you today?

Human: Can you tell me about the creation of blackholes?

AI: Sure! Black holes are regions of spacetime where the gravitational force is so strong that nothing, not even light, can escape from it. They are created when a very massive star dies and its core collapses in on itself, forming a singularity of infinite density. The intense gravity of the singularity pulls in all the matter and radiation around it, creating the black hole.

Code Generation

```
"""
Table departments, columns = [DepartmentId,
DepartmentName]
Table students, columns = [DepartmentId, StudentId,
StudentName]
Create a MySQL query for all students in the Computer
Science Department
"""

SELECT StudentId, StudentName
FROM students
WHERE DepartmentId IN (SELECT DepartmentId FROM
departments WHERE DepartmentName = 'Computer Science');
```

Reasoning

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

Solve by breaking the problem into steps. First, identify the odd numbers, add them, and indicate whether the result is odd or even.

Odd numbers: 15, 5, 13, 7, 1

Sum: 41

41 is an odd number.

Introduction to Prompt Engineering

Demo

Part 2

Advanced Techniques for Prompt Engineering

Few-shot Prompts

- Few-shot prompting allows us to provide **exemplars** in prompts to steer the model towards better performance

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

A: The answer is False.

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

A: The answer is True.

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

A: The answer is True.

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

A: The answer is False.

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

A: The answer is True.

Chain-of-Thought (CoT) Prompting

- Prompting can be further improved by instructing the model to reason about the task when responding
 - This is very useful for tasks that requiring reasoning
 - You can combine it with few-shot prompting to get better results
 - You can also do zero-shot CoT where exemplars are not available

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

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

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

A: Adding all the odd numbers (15, 5, 13, 7, 1) gives 41. The answer is False.

Tools and Applications

Demo