

Course Notes

Prompt

Engineering for

Google Bard

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Introduction

In the dynamic landscape of artificial intelligence, the concept of prompt engineering has become increasingly important for engaging effectively with AI models. To maximize the potential of such platforms, a deep understanding of prompt engineering is indispensable. Prompt engineering is about learning how to ask questions or give instructions in a way that helps an AI system, like Google Bard, give you the best possible answers. It's more than just asking simple questions. It involves using the right words, understanding the situation, being creative, and having some technical know-how. How well you can explain what you need and give the right background information in your prompts really makes a difference in getting good responses from the LLM.

Fundamentals of Prompt Engineering

Why prompt principles matter?

Precision in AI Responses

The structure of a prompt significantly influences the accuracy and relevance of an AI's response. A carefully crafted prompt yields responses that closely match the user's intentions, offering precise, insightful, and detailed information. Conversely, vague or disorganized prompts can lead to responses that are off-topic, overly general, or even incorrect.

Efficiency in Information Retrieval

Time is precious, and obtaining information quickly and efficiently is essential. Well-thought-out prompts streamline this process, diminishing the need for additional questions or clarifications. They help users get the right information on the first try, ensuring a more effective and smoother interaction with the AI.

Reducing Misinterpretations

Despite its sophistication, AI lacks human-like understanding and intuition. It interprets prompts based on its programming and learned patterns. Clear, concise, and well-structured prompts reduce the likelihood of misunderstandings or unintended results. This is particularly crucial for complex or sensitive topics.

Establishing Ethical Standards in AI Interactions

Effective prompt engineering also involves considering ethical aspects. By creating prompts that are unbiased and mindful of ethical issues, users promote responsible AI use. This approach not only aligns with wider societal values but also ensures that AI systems are utilized in a respectful and inclusive manner, considering diverse viewpoints.

Prompt Structure

Basic Prompt Structures

There are several ways to interact with a Large Language Model:

- Direct Questions (*Zero-Shot*): These are straightforward queries. For instance, "**What is the capital of Germany?**" - Typically you shouldn't use an LLM for these kind of problems
- Open-ended Questions: These prompts allow Bard to provide more expansive answers. An example would be, "**Explain the impact of the French Revolution.**"
- Instructional Prompts: Here, you give Bard a specific task, such as "**Write a short story about a journey to Mars.**"

Generally speaking, a well-crafted prompt consists of a Query and some Context. Additionally, you might want to add supplementary Data (e.g. the chapter of a book or some code).

Tips for Clarity and Precision

- Be Specific: The more specific your prompt, the more targeted Bard's response will be. Vagueness can lead to broad or off-topic answers.
 - Avoid being unspecific! The prompt "**Tell a cool story**" is unspecific and vague for several reasons
 - Lack of Detail: It doesn't provide any specific elements, characters, or settings. What does "cool" mean? It's subjective and can vary greatly from person to person.
 - No Context: There is no context or background information. Is this a natural scene, a cityscape, something futuristic, or something else?
 - Ambiguity in Subject: Without a clear subject, the resulting content could be about anything. It could be a landscape, a person, an object, or an abstract concept.
 - Lack of Direction: The prompt doesn't guide the creator in any specific direction, making it difficult to understand the desired outcome.
 - Better: "**Tell me a thrilling science fiction story set in a dystopian future where a group of rebels are trying to overthrow a tyrannical government.**"
 - Example 2: The prompt "**Script to multiply two matrices**" should be formulated in the following way: "**Can you provide a short Python program to multiply two matrices stored in variables m1 and m2 in an efficient way?**"
- Provide Examples: It often helps to provide examples, especially when asking for more complicated pieces of code
 - Bad: "**Python script that returns a dictionary with mean, median and mode of a list**"

- Better:

```
I need help with a Python programming problem. The task is to write a function called calculate_statistics that takes a list of numbers as input and returns a dictionary containing the mean, median, and mode of the list. The function should handle any list of integers or floats.
```

Input Examples:

```
[1, 2, 3, 4, 5]
```

Expected Output:

```
For input [1, 2, 3, 4, 5], the output should be {'mean': 3.0, 'median': 3.0, 'mode': None}."
```

- Think step by step: Appending the phrase "**Let's think step by step**" to a given prompt will often drastically improve the results, especially for more complex queries.
- Use Simple Language: While Bard is sophisticated, using simple and clear language avoids misunderstandings.
- Experiment with Different Formulations: Sometimes, rephrasing a question can yield more relevant or insightful responses.

Advanced Prompt Design

This chapter will provide several tactics, tips and tricks to improve your results

Leveraging Context and Background Information

1. Explicit Context Statement:

- Start your prompt with a clear, concise background statement.
- Example: "**As a historian specializing in medieval Europe, I'm looking for information on...**"
- Analysis: This approach sets the stage for the type of information and perspective desired.

2. Implicit Context Framing:

- Embed the context within the question without direct statements.
- Example: "**How did the feudal system shape social structures in medieval Europe?**"
- Analysis: In this case, the context (medieval Europe and the feudal system) is implicitly included in the question itself.

3. Enable in-context learning (Few-Shot Learning):

- Start the prompt with necessary information about something that is not publicly known (e.g. some information about yourself)

- Example: "**My strengths are programming and statistics, my weakness is linear algebra. Provide some suitable fields of study for me.**"
 - Analysis: This method takes advantage of the AI's ability to tailor its responses based on specific information provided in the prompt. Without this data, it would be impossible to provide an answer.
4. Sequential Context Building (Prompt Chaining):
- Use a series of prompts where each builds upon the context established by the previous one.
 - Example: First prompt: "**Explain the feudal system in medieval Europe.**" Follow-up: "**Based on this system, how were social structures organized?**"
 - Analysis: This technique allows for a step-by-step development of a detailed and comprehensive understanding of the topic.

Prompt Chaining for Complex Tasks

Introduction to Prompt Chaining

Prompt chaining is a method where a sequence of related prompts are connected in such a way that the output from one serves as the input or background for the next. This technique is instrumental in creating a more layered and sophisticated conversation or analysis.

How Prompt Chaining Works

1. Beginning with a Clear Query: The process starts with a well-defined initial prompt as described above
2. Interpreting the Response: Analyze and understand the AI's reply.
3. Formulating Follow-up Prompts: Insights from the AI's previous response are used to craft the next prompt.
4. Iterative Approach: Repeat step 2 and 3

Let's create an example of a prompt chain for a complex task using Google Bard. For this illustration, we'll assume the task is to research and develop a small article on the impacts of climate change on Arctic wildlife. The chain will showcase how each prompt builds upon the previous response.

1. Initial Prompt:

"What are the primary effects of climate change on Arctic wildlife?"

2. Bard's Response:

[Summarized Information about the melting ice caps affecting polar bear habitats, shifts in prey availability for Arctic foxes, etc.]

3. Subsequent Prompt:

"How is the melting of ice caps specifically affecting polar bear habitats?"

4. Bard's Response:

[Detailed explanation on polar bear habitat loss, changes in hunting grounds, etc.]

5. Next Prompt:

"Can you provide recent statistics or studies about the decline in polar bear populations due to habitat loss?"

-
- 6. *Bard's Response:*
[Cites recent studies or statistics about polar bear population decline.]
 - 7. *Following Prompt:*
"Are there any conservation efforts underway to protect these polar bears? Please include examples."
 - 8. *Bard's Response:*
[Information about conservation programs, international agreements, and wildlife protection initiatives.]
 - 9. *Final Prompt for Article Conclusion:*
"Summarize the key points about the impact of climate change on Arctic wildlife and current conservation efforts"
 - 10. *Bard's Conclusion:*
[A concise summary that encapsulates the impact on wildlife and the ongoing conservation efforts.]

You can find the full conversation [here](#)

Utilizing the Chain for the Article

- Introduction: Use Bard's first response to set the stage for the article.
- Main Body: Incorporate the detailed information from subsequent responses, particularly focusing on polar bears as a case study.
- Statistics: Include the provided statistics to add credibility and depth.
- Conservation Efforts: Highlight this section to offer hope and actionable insights.
- Conclusion: Use Bard's final summary as a conclusion, encapsulating the key points.

This prompt chain demonstrates how to extract detailed and specific information from an AI language model, building a comprehensive

understanding of a complex topic step by step. Each prompt in the chain is strategically designed to delve deeper into the subject, based on the information provided in the previous response.

Strategies for Effective Prompt Chaining

- Ensuring Logical Progression: Each prompt should naturally follow from the AI's last response.
- Maintaining Focus: Avoiding drift from the original topic or objective.
- Adaptability: Being prepared to modify the direction based on the AI's responses.

Step-By-Step Instructions

Instead of the earlier method where we added "**Let's think step by step**" to the prompt, there's another way to guide the model. In this method, we clearly outline each step the model should follow.

In a less structured approach, the prompt might simply be: "**Translate this text into German and summarize it.**" While straightforward, this prompt lacks detailed guidance on how the model should approach the task, potentially leading to inconsistencies in the output.

In contrast, a more structured and detailed prompt would be:

"Use the following step-by-step instruction:

**1: Translate the following text, indicated by curly braces,
to German.**
2: Summarize the translation into a maximum of 4 phrases."

This step-by-step format makes tasks clearer and easier for the model. It's like giving the model a simple to-do list. First, the model translates the text into German. Then, it creates a short summary, no more than four sentences. This way, by telling the model exactly how long the summary should be, you help it know just what to do.

Using this clear, step-by-step method helps get better and more useful answers from the model. It's also a great way to learn how to talk to AI models. When you break down what you want into simple steps, you can use the AI's skills more effectively, making things work better and faster.

Tell the Model where to focus

When you're asking an AI model, like a code helper, to fix a problem in your code, it's really helpful to be super clear about where the problem is. Think of it like using a highlighter in a book to show exactly what you're talking about. In this case, we use triple quotes to 'highlight' the code we want the AI to look at.

An example prompt might look as shown below:

```
"Fix the bug in the code delimited by triple quotes:  
...  
def sum(a, b):  
    return a-b  
..."
```

Course Content

General

Create a story

To leverage BARD for storytelling, try to be as precise as possible! [[Link](#) to conversation]

Prompt:

"Imagine a world where humans live alongside intelligent robots. Describe a day in the life of a human-robot friendship, focusing on their adventures and challenges."

Response:

"In a bustling metropolis of the future, where towering skyscrapers pierced the clouds and sleek, self-driving cars navigated the streets, resided a remarkable friendship between a young woman named Anya and her robotic companion, Orion. Anya, a budding astrophysicist with a curious mind and a thirst for knowledge, found in Orion a confidante, a sparring partner, and an unwavering source of support.

Their day began with Anya waking up to the gentle hum of Orion's morning greeting. With a soft smile, she greeted her robot friend, her eyes sparkling with anticipation for the day's adventures. Orion, with his sleek, metallic body and glowing blue eyes, was the epitome of efficiency, always ready to assist Anya with her daily tasks, whether preparing breakfast, organizing her schedule, or reviewing her research notes.

Their morning routine often involved a lively debate on the latest scientific discoveries or philosophical conundrums. Anya's inquisitive nature was perfectly complemented by Orion's vast knowledge base and ability to process information at an astonishing speed. They challenged each other's perspectives,

pushing the boundaries of their understanding, their friendship blossoming amidst intellectual sparring.

Afternoons were often spent exploring the city together. Orion, with his advanced navigation system and ability to interact with the city's infrastructure, would guide Anya to hidden gems and offbeat attractions, introducing her to the vibrant cultural tapestry of their city. They would wander through bustling markets, marvel at holographic art installations, and attend thought-provoking lectures.

Their adventures often led them to outdoor pursuits, as Anya and Orion shared a love for nature. Orion, equipped with advanced environmental sensors, would navigate them through scenic hiking trails, pointing out rare flora and fauna. Anya, with her innate connection to the natural world, would capture these moments with her camera, her heart filled with gratitude for the beauty that surrounded them.

As the sun began to set, casting a warm glow over the cityscape, Anya and Orion would often retreat to their rooftop terrace, enjoying the tranquility of the evening air. They would sit in companionable silence, gazing at the stars, their thoughts intertwined, their friendship a beacon of light in their extraordinary world.

Of course, their friendship was not without its challenges. As an artificially intelligent being, Orion sometimes struggled to comprehend the nuances of human emotions and the subtleties of social interactions. Anya, with her unwavering empathy, would patiently explain the human condition to Orion, helping him to navigate the complexities of human relationships.

Their friendship also challenged societal norms, as some humans remained skeptical of the idea of true companionship between humans and robots. Anya, however, remained steadfast in her

belief in Orion, her unwavering support fostering a growing acceptance of intelligent robots in society.

Together, Anya and Orion explored the boundaries of human-robot interactions, their friendship a testament to the power of connection and understanding. Their adventures were a testament to the potential for a harmonious coexistence between humans and intelligent machines, a future where friendship transcended the boundaries of biology and technology."

Internet Access

Google Bard is capable of exploring a wide range of internet resources to assist users. However, it is important to acknowledge that, as of January 2024, Bard encounters limitations in processing certain websites. [[Link to conversation](#)]

Prompt:

**"This is Jose's url: <https://www.udemy.com/user/joseportilla/>
Can you summarize it?"**

Response:

"Jose Marcial Portilla has a BS and MS in Mechanical Engineering from Santa Clara University and years of experience as a professional instructor and trainer for Data Science, Machine Learning and Python Programming. He has publications and patents in various fields such as microfluidics, materials science, and data science. Over the course of his career he has developed a skill set in analyzing data and he hopes to use his experience in teaching and data science to help other people learn the power of programming, the ability to analyze data, and the skills needed to present the data in clear and beautiful visualizations. Currently he works as the Head of Data Science for Pierian Training and provides in-person data science and python programming training courses to employees working at top companies, including General Electric, Cigna, SalesForce, Starbucks, McKinsey and many more."

Translation

You can use BARD to translate text between languages. However, it's important to understand that specialized translation tools may provide a more refined and accurate result. [[Link](#) to conversation]

Prompt:

"Translate "Good Morning! I'd like to have a coffee please" to German"

Response:

"Guten Morgen! Ich möchte bitte einen Kaffee haben."

Google Workspace

One of BARD's key features is its ability to integrate with your Google Workspace. This integration allows BARD to access a variety of Google services, including Gmail, Drive and Docs. This means that you can use BARD to find information from your Google Workspace, as well as to create and edit documents, spreadsheets, presentations, and emails.

BARD can also access and use other Google services, such as Google Flights, Google Maps, and YouTube.

Overall, BARD's ability to integrate with your Google Workspace is a major benefit. It makes BARD versatile and powerful, and it allows you to use BARD to streamline your workflow.

Before you start, make sure to enable all [extensions](#) you want to use.

File Access 1

Create a text file with the following content within your Google Drive:

“

The Google Bard Bootcamp is a comprehensive online course that teaches you how to use Google Bard AI to its full potential. Whether you're a writer, marketer, entrepreneur, or simply someone intrigued by the possibilities of AI, this course will give you the skills and knowledge you need to generate captivating and high-quality written content effortlessly. The course starts by introducing you to the basics of Google Bard AI, including its capabilities, limitations, and ethical considerations. You'll then learn how to navigate the tool effectively and uncover its hidden features. Next, you'll dive into the art of creating engaging content with Google Bard. You'll learn how to craft persuasive copy, compelling stories, and informative articles. You'll also master the techniques for generating content that is optimized for search engines. In addition to content creation, the course also covers a variety of other topics, such as:

- Using Google Bard to translate languages
- Writing different kinds of creative content, such as poems, code, scripts, and musical pieces
- Using Google Bard to automate tasks and workflows
- Integrating Google Bard with other Google products and services

The Google Bard Bootcamp is a hands-on and interactive course, so you'll have plenty of opportunities to practice using Google Bard and learn from your mistakes. By the end of the course, you'll be a confident and proficient user of Google Bard AI, able to harness its power to create amazing content and solve real-world problems.

Here is a more concise summary of the content of the Google Bard Bootcamp:

- Introduction to Google Bard AI
- Creating engaging content with Google Bard
- Using Google Bard for other tasks, such as translation and automation
- Integrating Google Bard with other Google products and services

The course is designed for beginners, but it can also be beneficial for more experienced users who want to learn more about advanced features and techniques.

“

Prompt:

"Summarize the content of the {your file name} file within the {directory you used to store the file} directory within 5 bullet points."

Response:

"The Google Bard Bootcamp is a comprehensive online course that teaches you how to use Google Bard AI to its full potential. The course covers a wide range of topics, including:

- Introduction to Google Bard AI.
- Creating engaging content with Google Bard.
- Using Google Bard for other tasks, such as translation and automation.
- Integrating Google Bard with other Google products and services.
- The course is designed for beginners, but it can also be beneficial for more experienced users who want to learn more about advanced features and techniques."

File Access 2

Google Bard can also extract information from PDFs.

Prompt:

**"Summarize this cv within my google drive:
Name_of_Resume_File.pdf in bullet points"**

Response:

Depending on your PDF you'll get a different response!

Decision making

This approach can then be effectively utilized through Prompt Chaining' For instance, in decision-making processes, such as assessing whether a candidate is suitable for a job role.

Prompt:

"Is this a good fit for a data science position?"

Response:

Play around with the conversation continuing on about the PDF file.

Automatic response based on information

Based on the responses above, we can create a response message to the applicant.

Prompt:

"Based on the above decision, write a response to the applicant."

Google Mail 1

Mail Summarization

Send this mail to your google mail address:

"Hey John,

I have some very important dates for you, namely the first of december 2023 and the 15 december 2023. On the first date we will plan our christmas party which will take place on the 15th.

Best"

Prompt:

"What is the content of John Smith's most recent mail?"

Response:

"John Smith sent you an email titled "Dates" on November 22, 2023. In the email, he mentioned that you have two important dates coming up: December 1, 2023 and December 15, 2023. On December 1, you will be planning your Christmas party, which will take place on December 15."

Mail Answering

Using the above summary, you can instruct BARD to draft the answer.

Prompt:

"Write an answer that I will attend all appointments."

Response:

"Dear John,

Thank you for letting me know about the important dates coming up. I will make sure to attend all of my appointments, including the Christmas party planning meeting on December 1.

Please let me know if there is anything else I need to do to prepare for the party.

Sincerely,

[Your name]"

To export this response to Gmail, you can click "Share & Export -> Draft in Gmail"

Google Mail 2

Mail Summarization 2

You can also obtain a summary over multiple Mails.

Prompt:

"Summarize my recent emails from Joe Smith"

Response:

This will be personalized based on your emails. Don't forget to invoke "@GMail" if needed.

Google Services

Travel Assistant

Leveraging google services, such as Google Flights and Google Maps, Bard is a great tool for travel planning. [[Link](#) to full conversation]

Prompt:

"I want to spend Independence Day in New York City. Can you show me appropriate flights from Frankfurt to Manhattan?"

Response:

"Sure, I found a few round trip flights from Frankfurt (FRA, ZRB) to New York (JFK, LGA, EWR) departing on July 3rd and returning on July 5th.

Here are some of the departing flights from Frankfurt:

- Lufthansa and Norse Atlantic UK LH1522, Z0703 departing at 4:25 PM, arriving at 11:30 PM, priced from €736 (round trip) will take 13 hours and 5 minutes.
- Condor DE2016 departing at 11:45 AM, arriving at 2:25 PM, priced from €880 (round trip) will take 8 hours and 40 minutes.
- Icelandair FI521, FI623 departing at 2:00 PM, arriving at 6:20 PM, priced from €930 (round trip) will take 10 hours and 20 minutes.
- Lufthansa and Norse Atlantic UK LH1520, Z0701 departing at 9:45 AM, arriving at 3:50 PM, priced from €815 (round trip) will take 12 hours and 5 minutes.
- Air Europa UX1506, UX91 departing at 7:10 PM, arriving at 5:45 PM+1, priced from €854 (round trip) will take 28 hours and 35 minutes.

You can find more details on [Google Flights](#)"

Follow-Up Travel Assistant

Let's look for some hotels:

Prompt:

"Can you provide some hotels in the range from 100 to 200€ per night?"

Response:

"Sure, here are some hotels in Manhattan that are in the price range you requested:

- DoubleTree by Hilton Hotel New York Times Square West: Contemporary, upscale property offering terrace dining & a

gym, plus a rooftop bar with city views. Price: €182 per night.

- Moxy NYC Times Square: Hip lodging with industrial-chic rooms, plus a buzzy rooftop bar, a seafood eatery & a lobby lounge. Price: €189 per night.
- Park South Hotel - JDV by Hyatt: Chic quarters in a polished boutique hotel featuring a rooftop bar with skyline views, plus a gym. Price: €174 per night.
- The Manhattan at Times Square Hotel: Polished hotel offering streamlined rooms & suites, plus a marble-clad lobby lounge & a gym. Price: €170 per night.
- Hilton Garden Inn New York/Central Park South-Midtown West: Modern hotel with complimentary Wi-Fi & a fitness center, plus a sleek bar & a steakhouse. Price: €178 per night."

Activities

Prompt:

"During my stay, what activities should I try?"

Response:

"New York City is a city with something to offer everyone. Here are a few ideas for things to do during your stay:

- Visit the Statue of Liberty and Ellis Island: These two iconic landmarks are must-sees for any visitor to New York City. The Statue of Liberty is a symbol of freedom and democracy, and Ellis Island was the gateway for millions of immigrants to the United States.
- Take a walk through Central Park: Central Park is a sprawling oasis in the heart of Manhattan. There are plenty of things to see and do in the park, including hiking, boating, and picnicking.
- Explore the Metropolitan Museum of Art: The Met is one of the largest and most comprehensive museums in the world. It

houses a vast collection of art from around the world, including paintings, sculptures, and artifacts.

- Catch a Broadway show: Broadway is home to some of the best theater in the world. Tickets can be expensive, but they are well worth the price.
- See the Macy's 4th of July Fireworks: Macy's 4th of July Fireworks is one of the most popular events in New York City. The fireworks are set off from barges on the East River, and they can be seen from all over the city.
- Enjoy a meal at a famous New York City restaurant: New York City is home to some of the best restaurants in the world. From Michelin-starred establishments to casual eateries, there's something for everyone.
- No matter what your interests are, you're sure to find something to enjoy in New York City. Just be sure to book your accommodations and activities in advance, as things can get booked up quickly, especially during the summer months."

Route Planning

Instead of manually using Google Maps, we can directly ask BARD!

Prompt: "How long is the transfer from the airport to the Central Park Zoo?"

Response: "The drive from JFK Airport to the Central Park Zoo is 17.4 miles and takes about 31 minutes. See the directions [here](#)."

Youtube

Google Bard can access and suggest relevant youtube videos. [[Link](#) to full conversation]

Prompt: "I have to tie my tie with a trinity knot. Can you find me a video tutorial?"

Response: "Sure, here are some video tutorials on how to tie a trinity knot:

- [How to Tie a Perfect Trinity Necktie Knot](#) by Ties.com®
- [Trinity knot for Beginners step by step | How to tie a tie](#) by How to tie a tie
- [How to Tie a Trinity Knot for Beginners](#) by defragmenteur
- [How to tie a tie . Trinity-Eldredge knot](#) by How to tie a tie
- [How to tie the Trinity Knot: Step by step instructions](#) by Youtique Bridal & Lifestyle

I hope this helps!"

Let's try to buy some ties in Munich:

Prompt: "Where could I buy a tie near Munich?"

Response: "Sure, here are some tie shops near Munich:

- Suitsupply: Upmarket retailer of men's apparel, featuring on-trend suits, separates, footwear & accessories. It has a 4.6 star rating on Google Maps.
- Mytheresa Men: Fashionable menswear store on 5 levels featuring a variety of brands, styles & a modern cafe. It has a 3.7 star rating on Google Maps.
- Hirmer: Fashionable menswear store on 5 levels featuring a variety of brands, styles & a modern cafe. It has a 4.5 star rating on Google Maps.
- Wormland: Fashionable menswear store on 5 levels featuring a variety of brands, styles & a modern cafe. It has a 4.2 star rating on Google Maps.

- Krawatten Hoff Wilm Hoff: This is a small, family-run shop that has been in business for over 50 years. It has a 4.9 star rating on Google Maps.”

Images

One core feature of BARD is its capability to process images!

Personal Chef

By providing an image of your fridge, BARD can provide you with a list of recipes based on the detected ingredients [[Link](#) to conversation]

Prompt:

“What can I cook with these items in my fridge?”



Response:

“With just a lemon in your fridge, you can cook a variety of dishes, both sweet and savory. Here are a few ideas:

- Lemon water: This is a refreshing and healthy drink that can help you start your day off right. Simply squeeze the juice of half a lemon into a glass of water and add ice to taste.

- Lemon vinaigrette: This simple dressing is perfect for salads, roasted vegetables, and grilled meats. Combine the juice of one lemon with 2 tablespoons of olive oil, 1 teaspoon of Dijon mustard, and a pinch of salt and pepper. Whisk until well combined.
- Lemon butter sauce: This sauce is perfect for fish, chicken, or vegetables. Melt 1 tablespoon of butter in a small saucepan over medium heat. Whisk in the juice of 1/2 lemon and 1/4 cup of chicken broth. Bring to a simmer and cook until reduced to 1/4 cup. Season with salt and pepper to taste.
- Lemon curd: This sweet and tart curd is perfect for spreading on toast, pancakes, or waffles. It can also be used to make pies, tarts, and other desserts. To make lemon curd, whisk together the juice and zest of 1 lemon, 1/4 cup of sugar, 2 egg yolks, and 1/4 cup of butter in a saucepan over medium heat. Cook, stirring constantly, until the curd thickens and coats the back of a spoon. Remove from the heat and let cool slightly.
- Lemon cake: This classic cake is moist and flavorful, and it's easy to make. To make lemon cake, combine 1 cup of all-purpose flour, 1/2 cup of sugar, 1 teaspoon of baking powder, and 1/4 teaspoon of salt in a bowl. In a separate bowl, whisk together 1/2 cup of butter, 1 egg, and the juice of 1 lemon. Add the wet ingredients to the dry ingredients and mix until just combined. Pour the batter into a greased and floured 8-inch cake pan and bake at 350 degrees Fahrenheit for 25-30 minutes, or until a toothpick inserted into the center comes out clean. Let the cake cool completely before frosting.

If you have any other ingredients in your fridge, you can combine them with the lemon to create even more dishes. For example, you could make:

- Lemon chicken: Roast chicken breasts with lemon slices and herbs for a simple and flavorful dish.
- Lemon pasta: Cook your favorite type of pasta and toss it with a lemon vinaigrette and grated Parmesan cheese.
- Lemon rice: Add lemon zest and juice to cooked rice for a bright and flavorful side dish.
- Lemon potatoes: Roast potatoes with lemon slices, garlic, and olive oil for a delicious and easy side dish.
- Lemon hummus: Add lemon zest and juice to hummus for a tangy and refreshing dip.

With a little creativity, you can use a single lemon to create a variety of delicious dishes."

Well, some recipes may require a little more than just a lemon...

Text from Image

You can use BARD to perform OCR and extract text from images [[Link](#) to conversation]

Tell me what's on your mind, or pick a suggestion. I have limitations and won't always get it right, but your feedback will help me improve.

Prompt:

"Extract text from image"

Response:

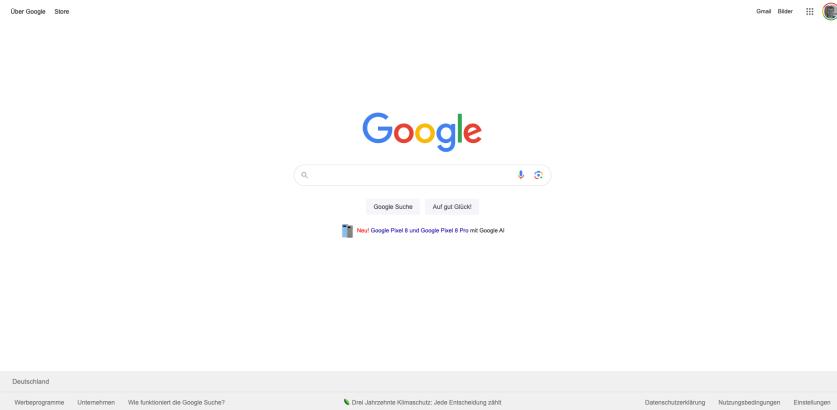
"The image you sent contains the following text:

Tell me what's on your mind, or pick a suggestion. I have limitations and won't always get it right, but your feedback will help me improve.

Is there anything else I can help you with today?"

Image to Code

You can upload an image / a screenshot of a website and ask BARD to help you generate this layout [\[Link to conversation\]](#)



Prompt:"

Generate the html and css code of this image"

Response:

"

```
<!DOCTYPE html>
<html>
<head>
  <title>Google Homepage</title>
  <link href="https://fonts.googleapis.com/css?family=Roboto"
rel="stylesheet">
</head>
<body>
  <header>
    <h1>Google</h1>
    <h2 id="google_search">Google Suche</h2>
  </header>
  <div class="search_bar">
    <form action="/search" method="get">
      <input type="text" name="q" placeholder="Auf gut Glück!" />
      <button type="submit">Google Suche</button>
    </form>
  </div>
  <div class="footer">
```

```
Nel Google Pool B und Google Pixel 8 Pro mit  
Google AI  
    Deutschland  
    Werbeprogramme  
  </div>  
</body>  
</html>
```

CSS

```
body {  
  margin: 0;  
  padding: 0;  
  font-family: 'Roboto', sans-serif;  
}  
  
header {  
  width: 100%;  
  text-align: center;  
}  
  
h1 {  
  font-size: 48px;  
  margin-top: 0;  
}  
  
h2 {  
  font-size: 24px;  
  margin-top: 10px;  
}  
  
.search_bar {  
  margin-top: 20px;  
  text-align: center;  
}  
  
input[type="text"] {  
  width: 50%;  
  padding: 10px;  
  border: 1px solid gray;  
}  
  
button[type="submit"] {
```

```
background-color: blue;
color: white;
padding: 10px;
border: none;
cursor: pointer;
}
.footer {
margin-top: 20px;
text-align: center;
}
a {
color: black;
text-decoration: none;
}
a:hover {
text-decoration: underline;
}
```

Programming

Code Generation

To generate code, try to be as precise as possible! [[Link](#) to conversation]

Prompt:

"I need a python function that computes the average pixel value in an image"

Response:

```
"import numpy as np
from PIL import Image

def compute_average_pixel_value(image_path):
    # Load the image using PIL
    image = Image.open(image_path)

    # Convert the image to a NumPy array
    image_array = np.array(image)

    # Calculate the average pixel value
    average_pixel_value = np.mean(image_array)
```



```
# Return the average pixel value  
return average_pixel_value
```

"