



Class: FY BSc

Subject : Prompt Engineering 101

Subject Code:

Chapter: Unit 2

Chapter Name: Prompt Engineering Techniques

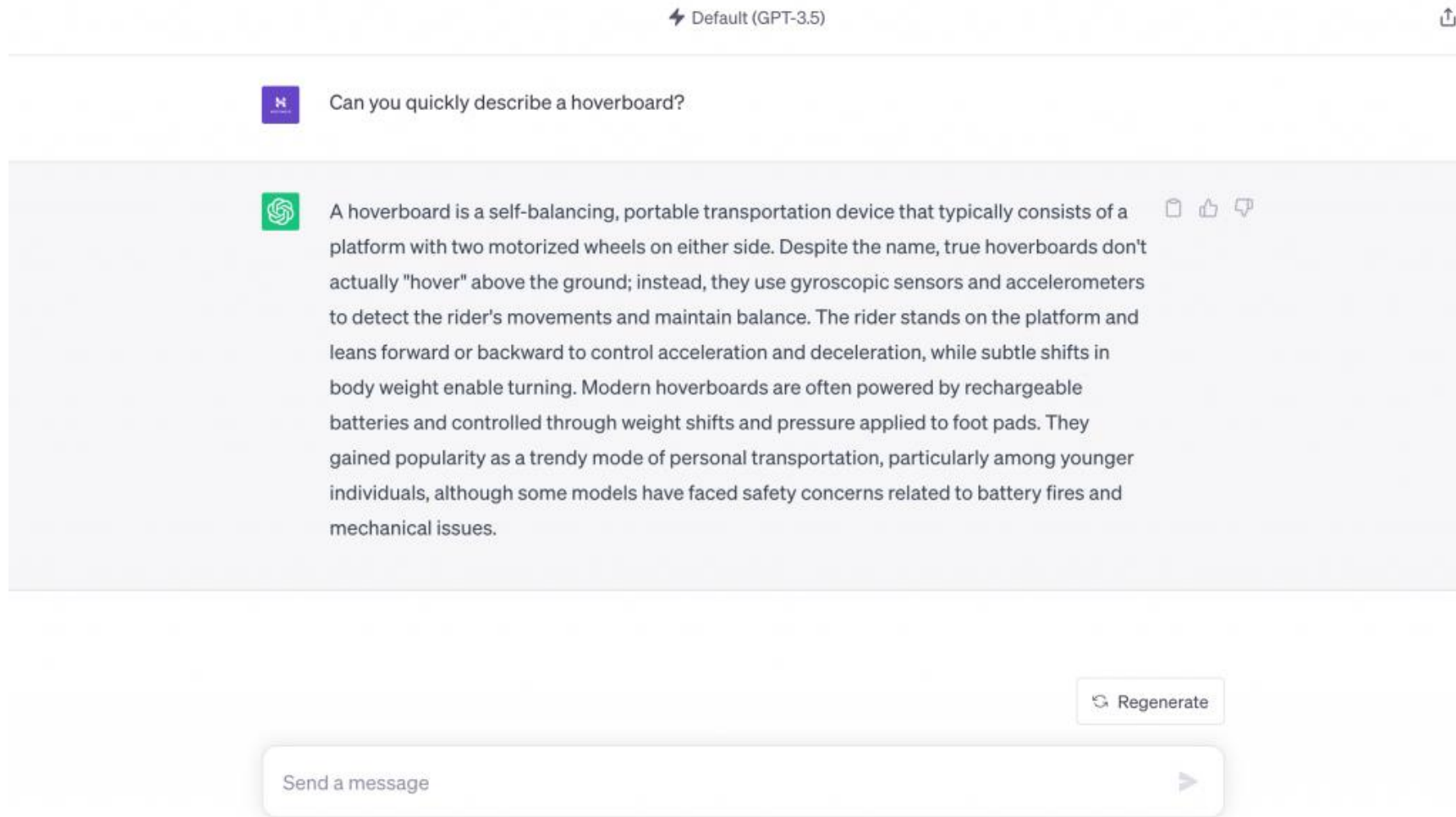
Today's Agenda

1. Zero-Shot Prompting
2. One-Shot Prompting
3. Information Retrieval
4. Creative Writing
5. Content Expansion
6. Content Summarization with Specific Focus
7. Template Filing
8. Prompt Reframing
9. Prompt Combination
10. Chain-Of-Thought Prompting
11. Iterative Prompting
12. Interactive Storytelling and Role-Playing
13. Implicit Information Injection
14. Language Translation with Contextual Nuance
15. Automatic Prompt Engineer

1 Zero-Shot Prompting

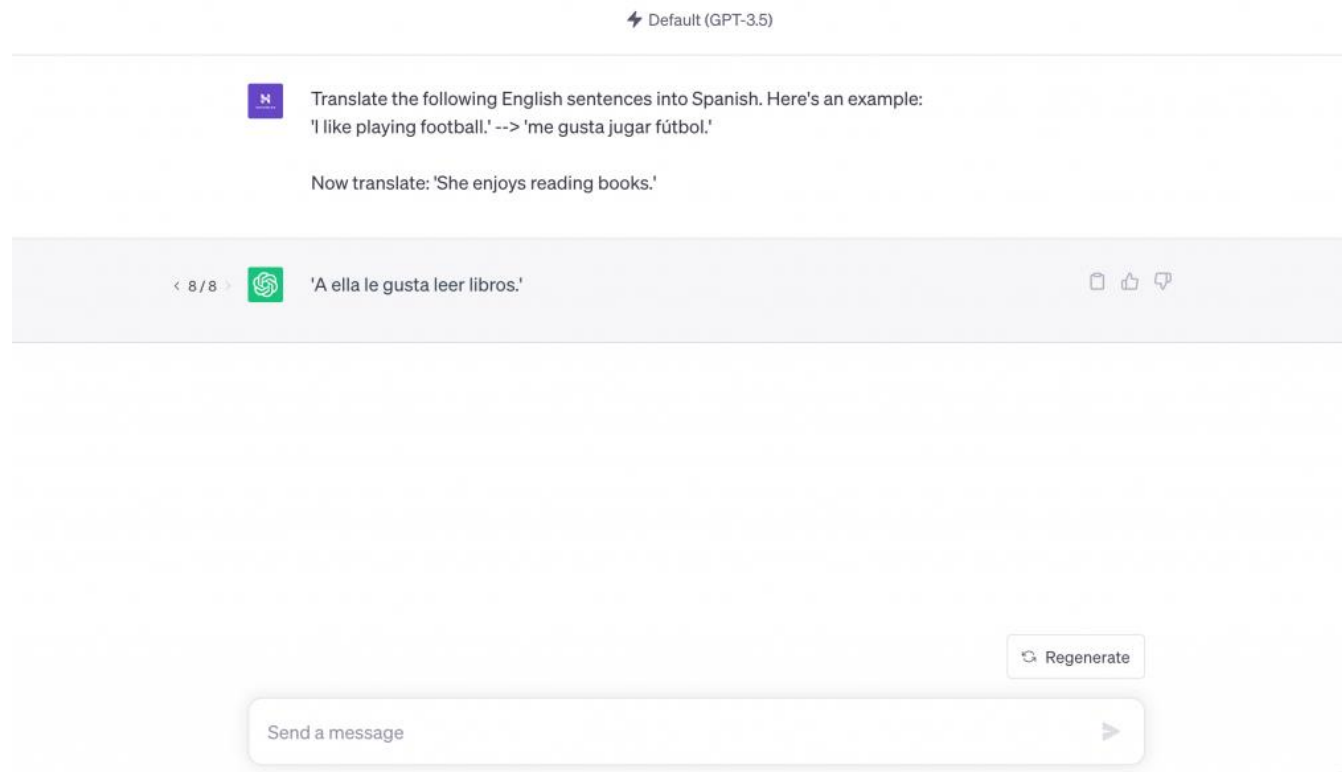
- Zero-shot prompting involves generating a response without feeding the large language models any examples or prior context.
- This technique is ideal when you need quick answers to basic questions or general topics.

1 Zero-Shot Prompting



2 One-Shot Prompting

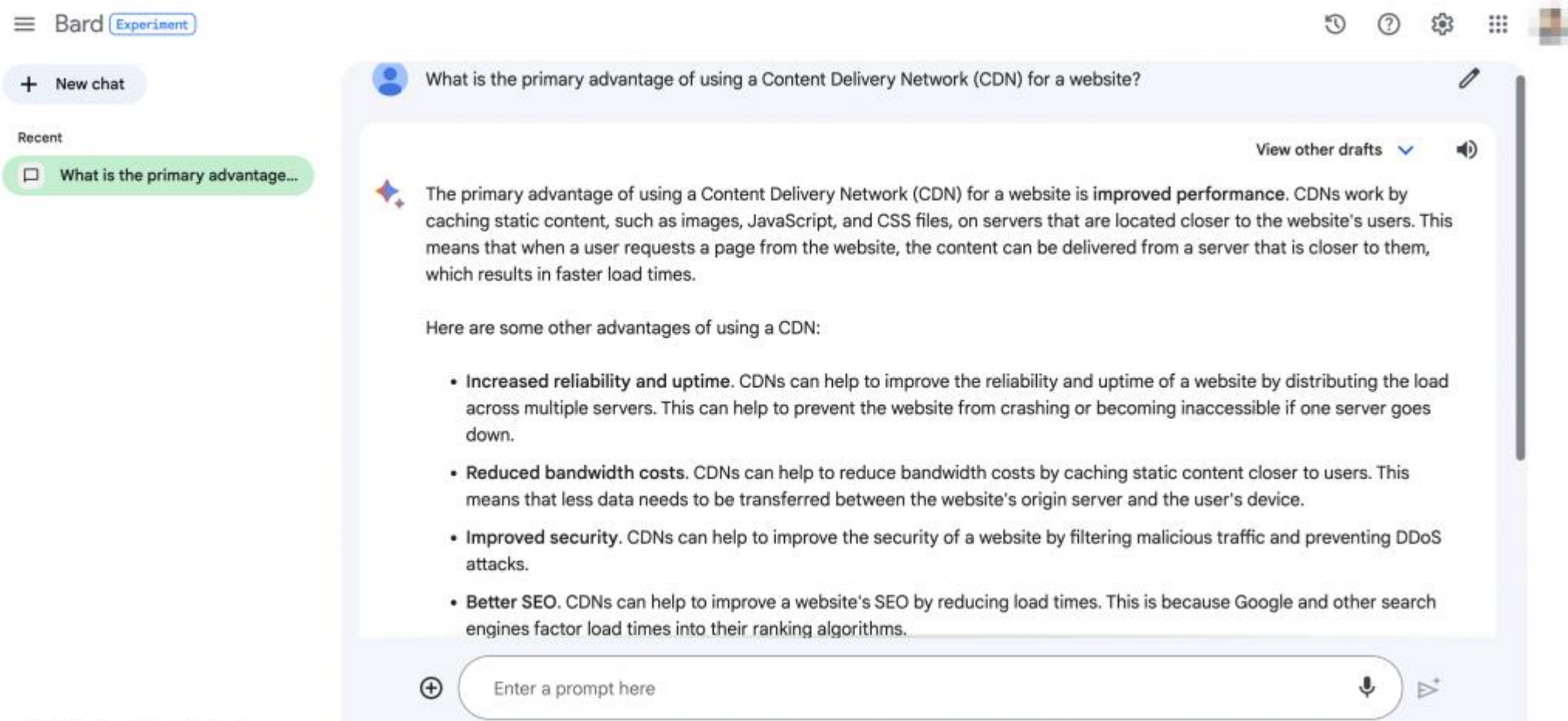
- One-shot prompting is about extracting a response based on one example or piece of context provided by the user.



3 Information Retrieval

- Information retrieval prompting is when you treat large language models as search engines.
- It involves asking the generative AI a highly specific question for more detailed answers.
- Some LLMs are better at information retrieval prompts due to their data sources.
- For example, Google's BARD can access current internet information, while ChatGPT only knows what happened before September 2021.

3 Information Retrieval



The screenshot shows the Google Bard chat interface. On the left, there's a sidebar with a menu icon, the name 'Bard', and a 'Bard Experiment' label. Below this is a 'New chat' button and a 'Recent' section with a single chat entry: 'What is the primary advantage...'. The main chat area displays a user prompt: 'What is the primary advantage of using a Content Delivery Network (CDN) for a website?'. The AI response, marked with a blue star icon, explains that the primary advantage is improved performance due to caching static content on servers closer to users. It then lists four other advantages: increased reliability and uptime, reduced bandwidth costs, improved security, and better SEO. The interface includes standard chat controls like a microphone icon, a send button, and a 'View other drafts' link.

≡ Bard Experiment

+ New chat

Recent

What is the primary advantage...

What is the primary advantage of using a Content Delivery Network (CDN) for a website?

View other drafts

The primary advantage of using a Content Delivery Network (CDN) for a website is improved performance. CDNs work by caching static content, such as images, JavaScript, and CSS files, on servers that are located closer to the website's users. This means that when a user requests a page from the website, the content can be delivered from a server that is closer to them, which results in faster load times.

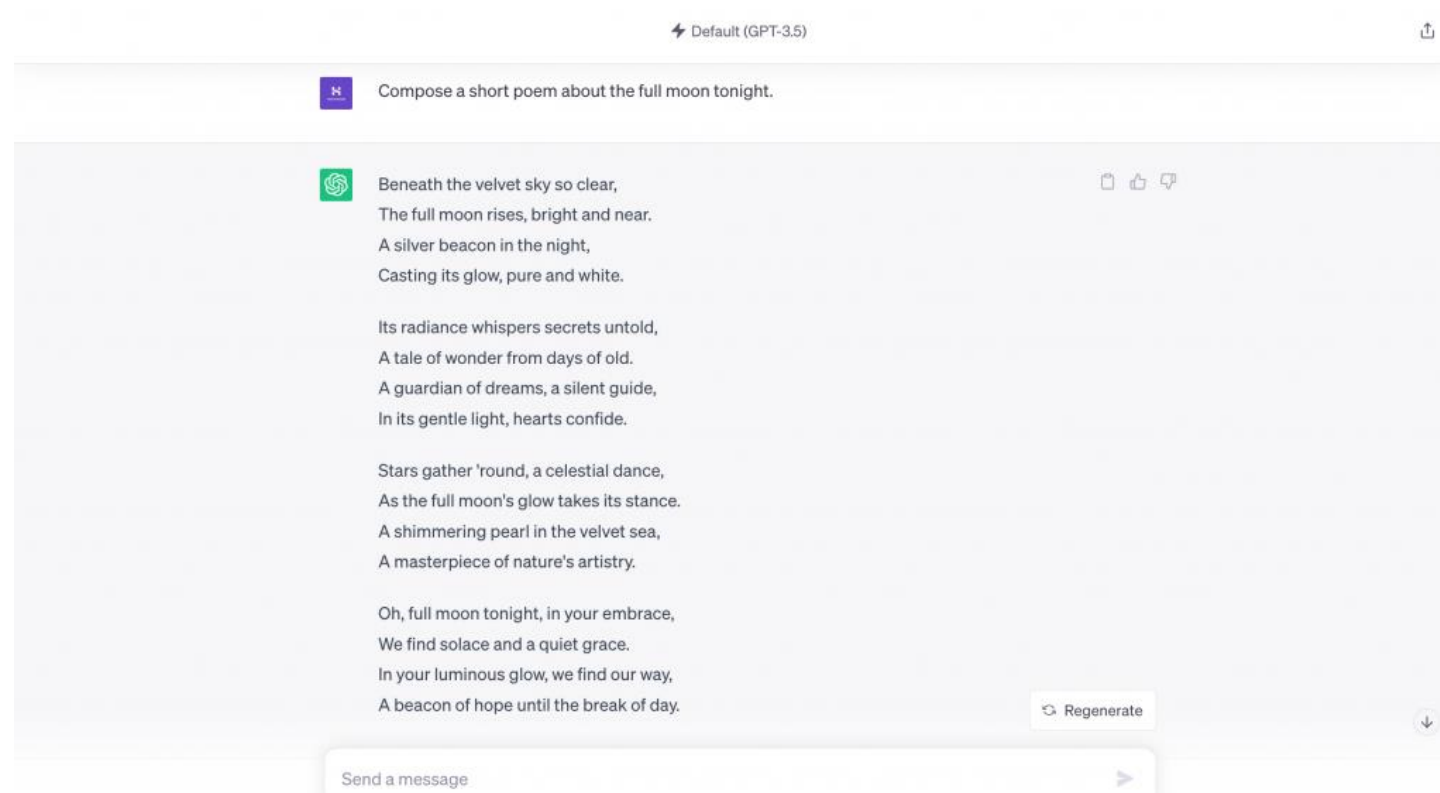
Here are some other advantages of using a CDN:

- **Increased reliability and uptime.** CDNs can help to improve the reliability and uptime of a website by distributing the load across multiple servers. This can help to prevent the website from crashing or becoming inaccessible if one server goes down.
- **Reduced bandwidth costs.** CDNs can help to reduce bandwidth costs by caching static content closer to users. This means that less data needs to be transferred between the website's origin server and the user's device.
- **Improved security.** CDNs can help to improve the security of a website by filtering malicious traffic and preventing DDoS attacks.
- **Better SEO.** CDNs can help to improve a website's SEO by reducing load times. This is because Google and other search engines factor load times into their ranking algorithms.

Enter a prompt here

4 Creative Writing

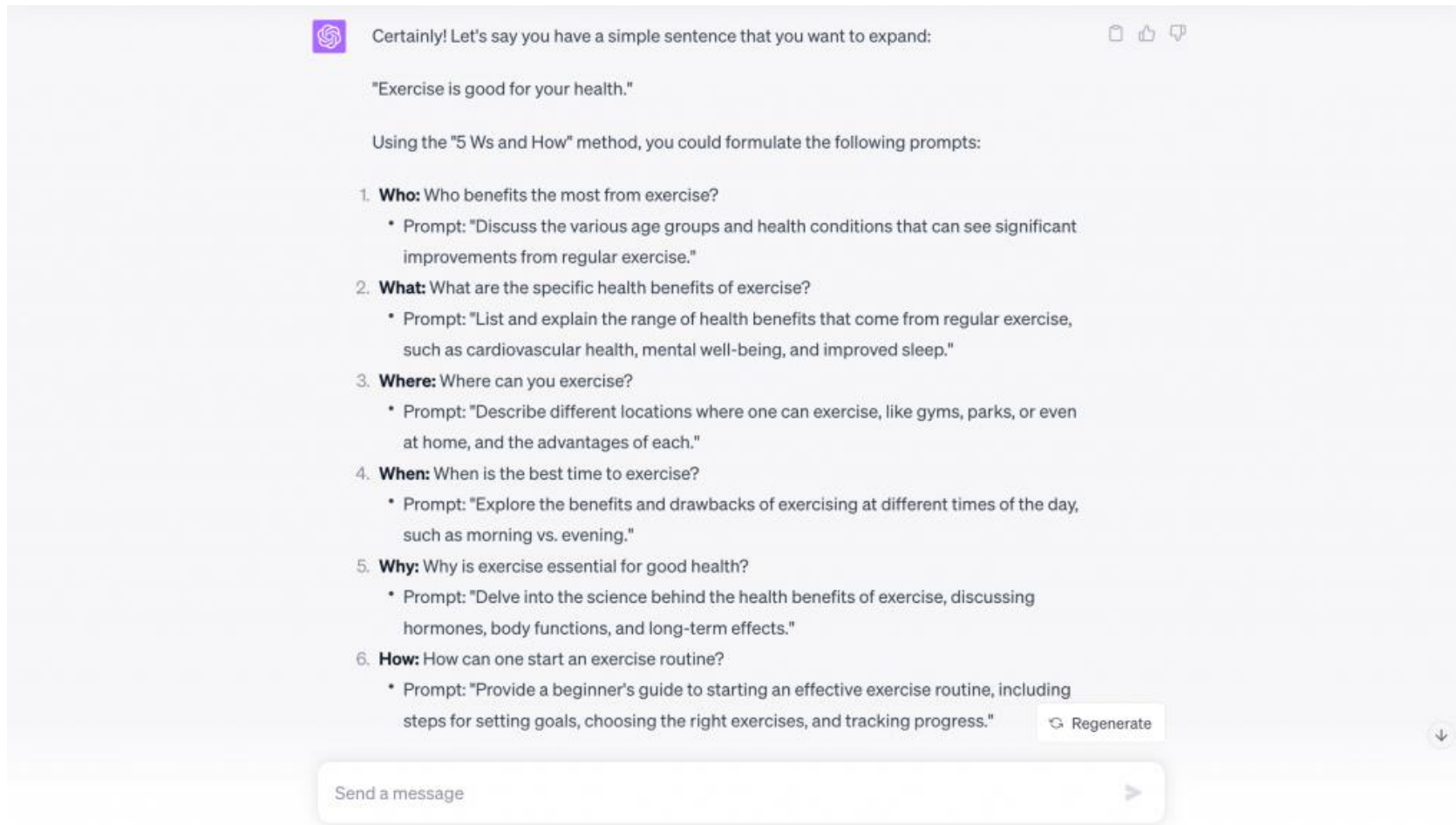
- Crafting creative content prompts can help you generate imaginative narratives, captivating stories, and unique textual expressions tailored to your audience's preferences and interests.



5 Content Expansion

- The context expansion technique revolves around enriching the information given to the AI to effectively enhance its understanding.
- A good way to write context expansion prompts is through the 5 “Ws and How” method, which involves expanding the query by asking Who, What, Where, When, Why, and How questions related to the subject matter.

5 Content Expansion



Certainly! Let's say you have a simple sentence that you want to expand:

"Exercise is good for your health."

Using the "5 Ws and How" method, you could formulate the following prompts:

1. **Who:** Who benefits the most from exercise?
 - Prompt: "Discuss the various age groups and health conditions that can see significant improvements from regular exercise."
2. **What:** What are the specific health benefits of exercise?
 - Prompt: "List and explain the range of health benefits that come from regular exercise, such as cardiovascular health, mental well-being, and improved sleep."
3. **Where:** Where can you exercise?
 - Prompt: "Describe different locations where one can exercise, like gyms, parks, or even at home, and the advantages of each."
4. **When:** When is the best time to exercise?
 - Prompt: "Explore the benefits and drawbacks of exercising at different times of the day, such as morning vs. evening."
5. **Why:** Why is exercise essential for good health?
 - Prompt: "Delve into the science behind the health benefits of exercise, discussing hormones, body functions, and long-term effects."
6. **How:** How can one start an exercise routine?
 - Prompt: "Provide a beginner's guide to starting an effective exercise routine, including steps for setting goals, choosing the right exercises, and tracking progress."

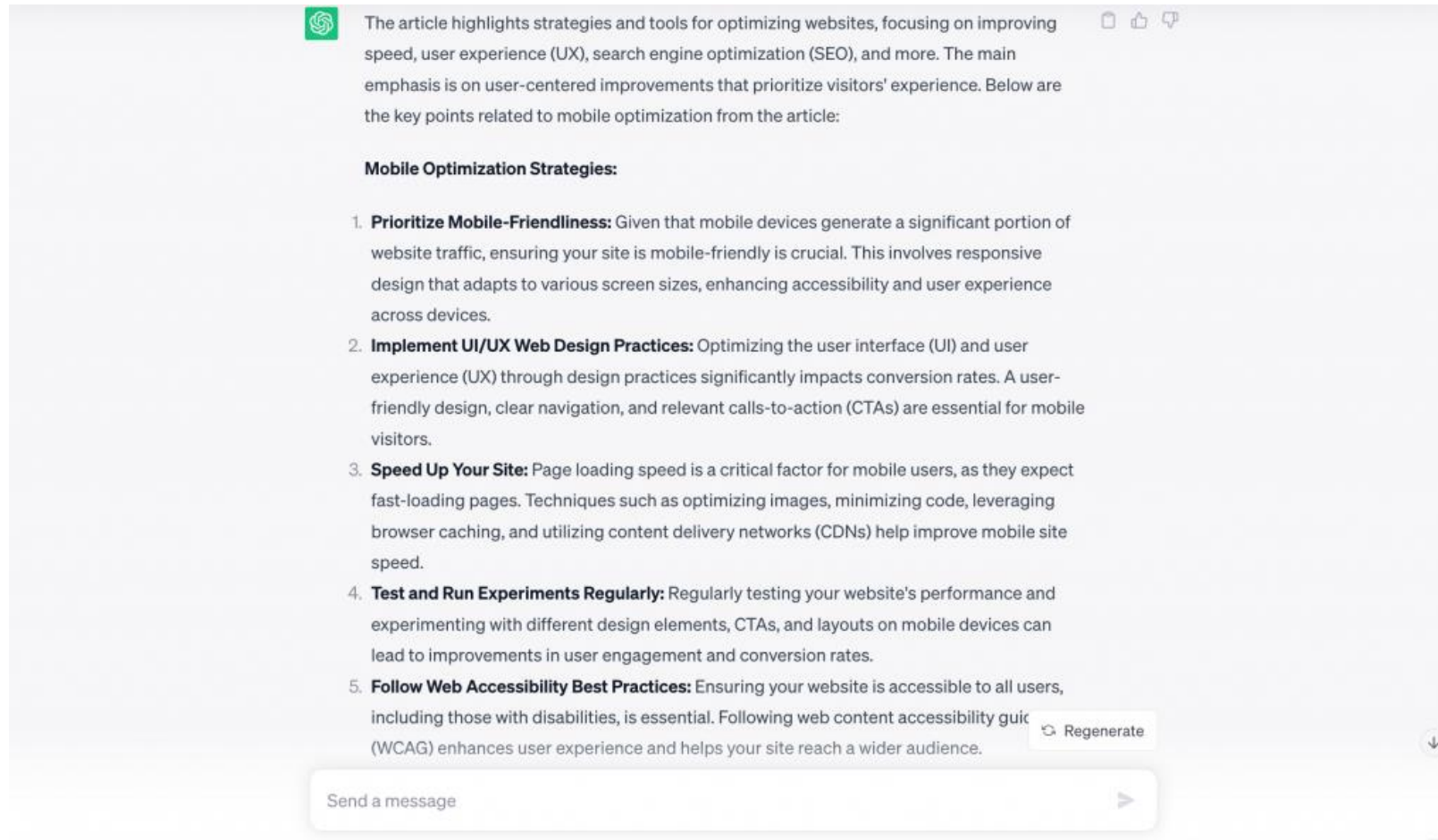
Send a message

Regenerate

6 Content Summarization with Specific Focus

- Effective prompt engineering is also about directing the AI's attention to specific parts of the input, especially when you want concise summaries with a particular emphasis.
- By crafting precise instructions, you can highlight which elements of the text you want the model to prioritize, ensuring the summary captures the essence of the desired focus.
- Suppose you have a comprehensive guide on website optimization techniques, but you're only interested in mobile optimization strategies. In this case, your prompt should clearly indicate it.
- For example, "Summarize this article on website optimization, but only focus on strategies related to mobile optimization: [copy+paste article here]."

6 Content Summarization with Specific Focus



The screenshot shows a chat window with a green AI icon in the top left. The main text is a summary of an article on website optimization, focusing on speed, UX, and SEO. It lists five key points for mobile optimization. At the bottom, there is a 'Send a message' input field and a 'Regenerate' button.

The article highlights strategies and tools for optimizing websites, focusing on improving speed, user experience (UX), search engine optimization (SEO), and more. The main emphasis is on user-centered improvements that prioritize visitors' experience. Below are the key points related to mobile optimization from the article:

Mobile Optimization Strategies:

- 1. Prioritize Mobile-Friendliness:** Given that mobile devices generate a significant portion of website traffic, ensuring your site is mobile-friendly is crucial. This involves responsive design that adapts to various screen sizes, enhancing accessibility and user experience across devices.
- 2. Implement UI/UX Web Design Practices:** Optimizing the user interface (UI) and user experience (UX) through design practices significantly impacts conversion rates. A user-friendly design, clear navigation, and relevant calls-to-action (CTAs) are essential for mobile visitors.
- 3. Speed Up Your Site:** Page loading speed is a critical factor for mobile users, as they expect fast-loading pages. Techniques such as optimizing images, minimizing code, leveraging browser caching, and utilizing content delivery networks (CDNs) help improve mobile site speed.
- 4. Test and Run Experiments Regularly:** Regularly testing your website's performance and experimenting with different design elements, CTAs, and layouts on mobile devices can lead to improvements in user engagement and conversion rates.
- 5. Follow Web Accessibility Best Practices:** Ensuring your website is accessible to all users, including those with disabilities, is essential. Following web content accessibility guidelines (WCAG) enhances user experience and helps your site reach a wider audience.

Send a message

Regenerate

7 Template Filling

- Template filling involves using placeholders within a standard template, enabling customization of AI-generated content by substituting specific variables.
- Common applications include eCommerce product descriptions and personalized email generation, where predefined templates ensure consistency while allowing for variable content.
- In eCommerce, product descriptions can be dynamically generated with details like product name, features, and price to tailor descriptions for various items.
- Personalized emails benefit from dynamic template filling by maintaining a consistent structure while incorporating individualized elements such as the recipient's name and the service being offered.
- This technique streamlines content creation processes, ensuring adherence to guidelines and formats while still allowing for personalization and customization based on context or user information.

7 Template Filling



Generate a personalized welcome email using the template 'Hello {Name}, Welcome to our {Service}. We're glad you're here! {Closing}'

Here, {Name}, {Service}, {Closing} are placeholders. you need to replace these place holders with the following list of variables to write a welcome email for each variable

{Name}: John, Paul, Brian

{Service}: Hostinger WordPress Hosting, Hostinger Partner Program, Hostinger Pro

{Closing}: Warm regards, Best regards, Best wishes



Sure, here are three personalized welcome emails using the provided template for each combination of variables:



1. **Name:** John

Service: Hostinger WordPress Hosting

Closing: Warm regards

Subject: Welcome, John! Get Started with Hostinger WordPress Hosting

Hello John,

Welcome to our Hostinger WordPress Hosting! We're excited to have you on board. With our powerful hosting solution, you can create and manage your WordPress website with ease.

Whether you're a beginner or an experienced user, our platform offers the tools and features to help you succeed online. If you have any questions or need assistance, our support team is here to help.

Once again, welcome to Hostinger WordPress Hosting!

Warm regards,

[Your Name]

[Your Position]

Hostinger

2. **Name:** Paul

Service: Hostinger Partner Program

Closing: Best regards

Subject: Welcome, Paul! Join the Hostinger Partner Program

Regenerate



Send a message



8 Prompt Reframing

- Prompt reframing or AI prompt customization lets you subtly change your prompts' wording while maintaining the query's original intent.
- It can encourage the language model to produce a variety of responses that answer the original intent in different ways.
- **Wording Techniques to Maintain Intent**
- One approach is to use synonyms or rephrase questions while keeping the main subject consistent. It will yield different nuances in the responses, which can be particularly useful when you're looking for various ideas.

8 Prompt Reframing

What are some ways to optimize a website for speed?

Optimizing a website for speed is crucial for improving user experience and SEO ranking. Here are some strategies to achieve this:

1. **Minimize HTTP Requests:** Reducing the number of elements loaded on a page can significantly improve its speed.
2. **Enable Compression:** Use Gzip or Brotli to reduce the size of your CSS, HTML, and JavaScript files.
3. **Minify and Combine Files:** Minify CSS, JavaScript, and HTML files to remove unnecessary characters and spaces. Combining smaller files can also reduce HTTP requests.
4. **Use Asynchronous Loading:** Load JavaScript files asynchronously to ensure that they don't block the rendering of your page.
5. **Optimize Images:** Compress image files without significantly compromising quality. Consider using newer formats like WebP.
6. **Leverage Browser Caching:** Cache assets that don't frequently change to reduce server load and speed up client-side loading.
7. **Reduce Server Response Time:** Optimize your server's performance by using techniques like load balancing and utilizing Content Delivery Networks (CDNs).
8. **Optimize CSS and JavaScript:** Remove unused CSS and JavaScript code with tools like Tree-shaking or PurifyCSS.
9. **Improve Server Time-to-First-Byte (TTFB):** Ensure that the server responds quickly to the initial request. This may involve optimizing your database or upgrading your hosting.
10. **Utilize Lazy Loading:** Load images and other media files only when they're visible to the user.

Send a message

Can you list techniques to improve website loading times?

Certainly! While the overarching goal is the same—to speed up your website—the language of the question slightly changes the focus. Here's a list that emphasizes techniques for quickening website load times:

1. **Server-Side Caching:** Implement server-side caching techniques like object caching and full-page caching to minimize database queries.
2. **Resource Preloading:** Use the `rel=preload` attribute to preload important resources, thereby reducing load times.
3. **Defer Offscreen Images:** Implement offscreen image deferral so that only visible images load initially, thus speeding up page rendering.
4. **Use Sprite Sheets:** Combine multiple small images like icons into a single image sprite sheet to reduce the number of HTTP requests.
5. **Inline Small CSS/JS:** Include small CSS and JavaScript directly in the HTML document to cut down on HTTP requests.
6. **Connection Pooling:** Reuse database and network connections to reduce the time spent in connection initiation.
7. **Reduce Redirects:** Each redirect triggers an additional HTTP request-response cycle, increasing the overall load time.
8. **Adaptive Image Sizing:** Serve different image sizes based on the user's device to reduce unnecessary bandwidth consumption.
9. **Content Chunking:** Use AJAX to load content in chunks, allowing the user to start interacting with the page more quickly.

Send a message

9 Prompt Combination

- The prompt combination technique involves merging different instructions or questions into a single, multi-faceted prompt to elicit a comprehensive answer from the AI.
- Let's take this prompt as an example – "Can you explain the differences between shared hosting and VPS hosting and recommend which is better for a small eCommerce website?"

9 Prompt Combination



Certainly! Shared hosting and VPS (Virtual Private Server) hosting are two common types of web hosting services, each with its own characteristics and benefits. Let's break down the differences and discuss which might be better for a small eCommerce website.

1. Shared Hosting:

- **Setup:** In shared hosting, multiple websites share the resources of a single physical server. Each website gets a portion of the server's resources like CPU, memory, and disk space.
- **Performance:** Shared hosting can be cost-effective, but since resources are shared, the performance of your website can be affected by other websites on the same server. If a neighboring site experiences a spike in traffic, it might impact your site's performance.
- **Control:** You have limited control over server settings and configurations. The hosting provider manages most aspects of the server.
- **Suitable for:** Shared hosting is generally suitable for small websites with low to moderate traffic, personal blogs, and simple websites that don't require high performance.

2. VPS Hosting:

- **Setup:** In VPS hosting, a single physical server is divided into multiple virtual servers, each having its own dedicated resources and operating system. This creates an environment that is more isolated than shared hosting.
- **Performance:** VPS hosting offers better performance and stability compared to shared hosting since you have dedicated resources. The performance of your eCommerce website is less likely to be affected by other websites.

Send a message

- **Control:** With a VPS, you have more control over server settings, configurations, and software installations. It's closer to having your own server but without the high costs.
- **Suitable for:** VPS hosting is a good choice for websites that require more resources, customization, and better performance. Small to medium eCommerce websites that anticipate growth in traffic and transactions could benefit from VPS hosting.

Recommendation for a Small eCommerce Website:

For a small eCommerce website, it's generally recommended to consider starting with shared hosting. This is particularly true if your website is just starting out, has limited traffic, and you want to keep costs lower initially. Shared hosting is easier to manage, more cost-effective, and sufficient for smaller sites with lower resource demands.

However, as your eCommerce business grows and you experience increased traffic and transactions, you might want to consider upgrading to VPS hosting. VPS hosting offers better performance, reliability, and customization options. It's a scalable solution that can accommodate your website's growth while maintaining a good user experience for your customers.

Remember that the specific hosting provider and their quality of service also play a significant role. Researching and choosing a reputable hosting provider is crucial regardless of the type of hosting you opt for.

Regenerate

Send a message

10 Chain-Of-Thought Prompting

- Chain-of-thought prompting is about using real-time AI interactions to guide the tool toward more accurate and comprehensive answers.
- Instead of relying solely on a single prompt, you can provide a sequence of related examples or questions to refine the original query.
- How to Use Chain-of-Thought Prompting?
- The key to effective chain-of-thought prompting is to break down a complex question or topic into smaller, more manageable parts.
- Then, present these parts as a sequence of prompts that build upon each other, nudging the AI towards the desired answer.

10 Chain-Of-Thought Prompting

Initial Prompt

1. "Can you explain what an investment portfolio is?"

AI Response: An investment portfolio is a collection of various financial assets held by an individual or institution. It can include stocks, bonds, real estate, and other investment vehicles. The aim is to maximize returns while managing risk.

Follow-up Prompts and Responses

1. "What are the key considerations when building an investment portfolio?"

AI Response: Key considerations include risk tolerance, investment horizon, financial goals, diversification, asset allocation, and ongoing management.

2. "Can you elaborate on risk tolerance?"

AI Response: Risk tolerance refers to your ability and willingness to withstand fluctuations in the value of your investment. It is generally categorized as low, medium, or high and is shaped by factors like age, financial situation, and investment goals.

3. "How does one determine the right asset allocation based on risk tolerance?"

AI Response: Asset allocation is the process of dividing your investments among different asset classes like stocks, bonds, and cash equivalents. A conservative investor with low risk tolerance might opt for a higher percentage of bonds and cash, while an aggressive investor with high risk tolerance might lean more towards stocks.

4. "What are some common strategies for ongoing portfolio management?"

AI Response: Common strategies include periodic rebalancing, dollar-cost averaging, and tactical asset allocation. Monitoring for changes in financial goals or risk tolerance is also essential.

5. "Can you summarize how to build an investment portfolio?"

AI Response: Certainly! Building an investment portfolio involves understanding your financial goals and risk tolerance, selecting the right asset allocation based on these factors, and employing ongoing management strategies like rebalancing and monitoring.

Regenerate



Send a message



11 Iterative Prompting

- Iterative prompting is another effective technique where you build upon previous responses by asking follow-up questions.
- With it, you can dive deeper into a topic, extract additional insights, or clarify any ambiguities from the initial output.
- **How to Use Iterative Prompting**
 - The key to iterative prompting is being attentive to the AI's initial answer.
 - You can frame your follow-up prompt to elaborate on a specific part of that answer, dig into a subtopic, or seek clarification. It is especially useful when you need to gather detailed information.
 - LLMs that are more adept at natural language processing (NLP) can expertly handle iterative prompts and craft their responses in a human-like manner.

11 Iterative Prompting

The screenshot shows a chat interface with a light beige background. At the top, a user prompt (H) asks for movie suggestions. The AI response (AI) lists five highly rated movies. Below this, a second user prompt (H) asks for recent sci-fi recommendations. The AI response (AI) lists five recent sci-fi movies. At the bottom, there is a text input field labeled 'Message Claude...' and a blue send button.

Suggest a good movie for me to watch. **H**

Here are some highly rated movie recommendations for you:

- Parasite – A thrilling Korean film that provides an insightful look at class divides. Won the Academy Award for Best Picture in 2020.
- Inception – A mind-bending sci-fi film from Christopher Nolan. Features impressive visual effects and an original story.
- The Godfather – Francis Ford Coppola's iconic gangster drama featuring stunning performances. Frequently tops lists of the greatest films ever made.
- The Shawshank Redemption – An uplifting drama about hope and friendship in a prison setting. Often voted the best movie of all time by fans.
- The Dark Knight – A gripping superhero film starring Christian Bale as Batman facing off against Heath Ledger's Joker. Brought critical acclaim to the comic book genre.

AI Copy

Can you recommend some highly acclaimed sci fi movies that recently came out? **H**

Here are some highly acclaimed recent sci-fi movie recommendations:

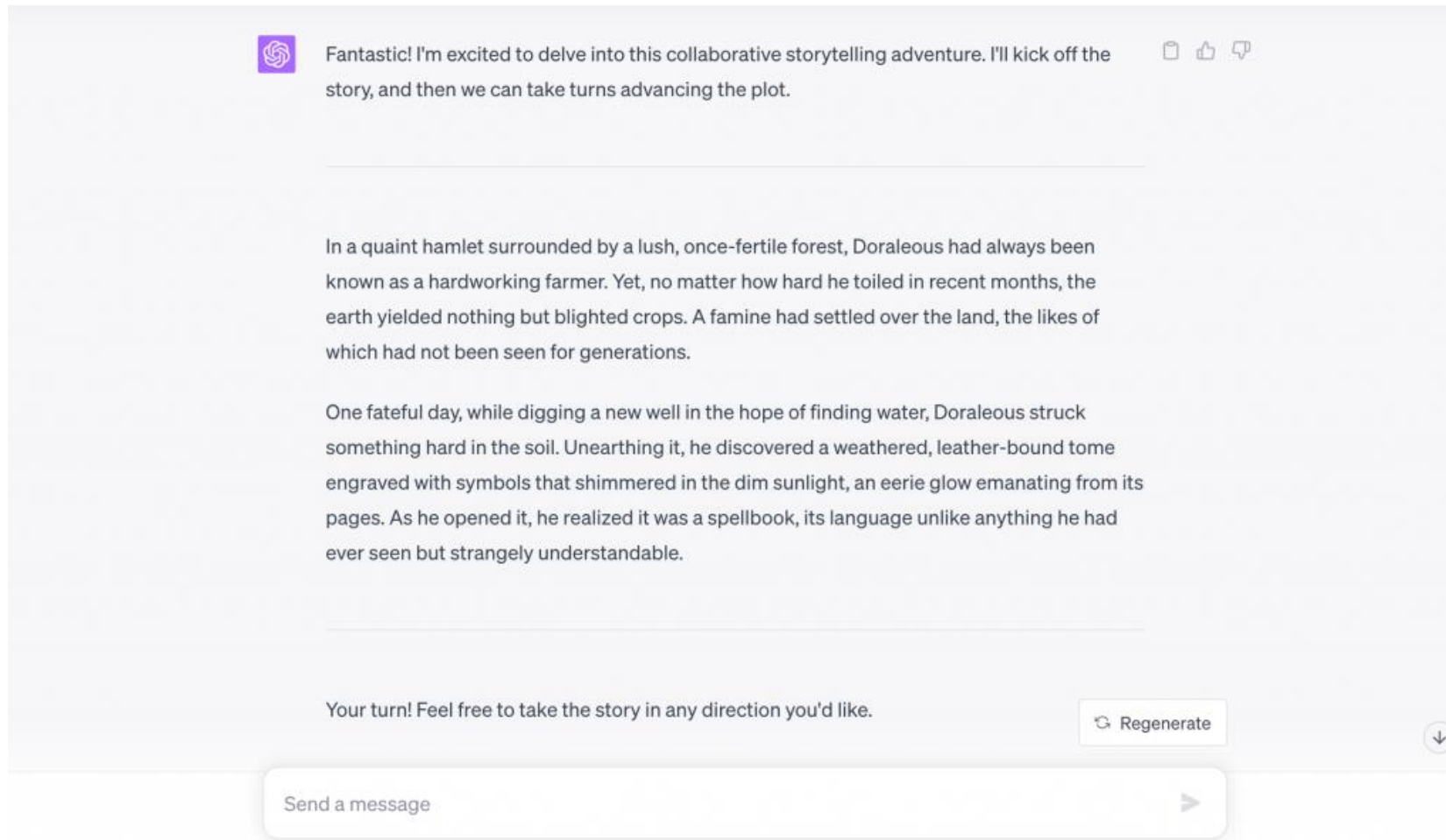
- Dune (2021) – Epic adaptation of the classic novel with stunning visuals and world-building. Directed by Denis Villeneuve.
- Everything Everywhere All at Once (2022) – Creative multiverse film with great performances. Brought fresh ideas to the sci-fi genre.
- Prey (2022) – Thrilling Predator prequel set in the Comanche Nation 300 years ago. Filled with action and suspense.
- Nope (2022) – Intriguing horror/sci-fi from Jordan Peele about mysterious UFO events. Very original story and concepts.
- The Adam Project (2022) – Time travel sci-fi starring Ryan Reynolds with fun humor and adventure. Has emotional depth beyond the action.

Message Claude...

12 Interactive Storytelling and Role-Playing

- Collaborative storytelling goes a step further by letting the AI adapt to your inputs in real time.
- It allows for a back-and-forth exchange where you and the tool contribute to the unfolding story, creating an interactive and immersive experience.
- **Example**
- **Prompt** – I want to start a collaborative storytelling exercise with you. We'll be writing a fantasy story about a land where magic exists but has been forgotten for a long time.
- Here's the main character and the end goal of the story:
 1. Character: Doraleous, a young farmer who accidentally discovers an ancient spellbook.
 2. Goal: To harness the power of magic to end a famine that has hit their forest hamlet.

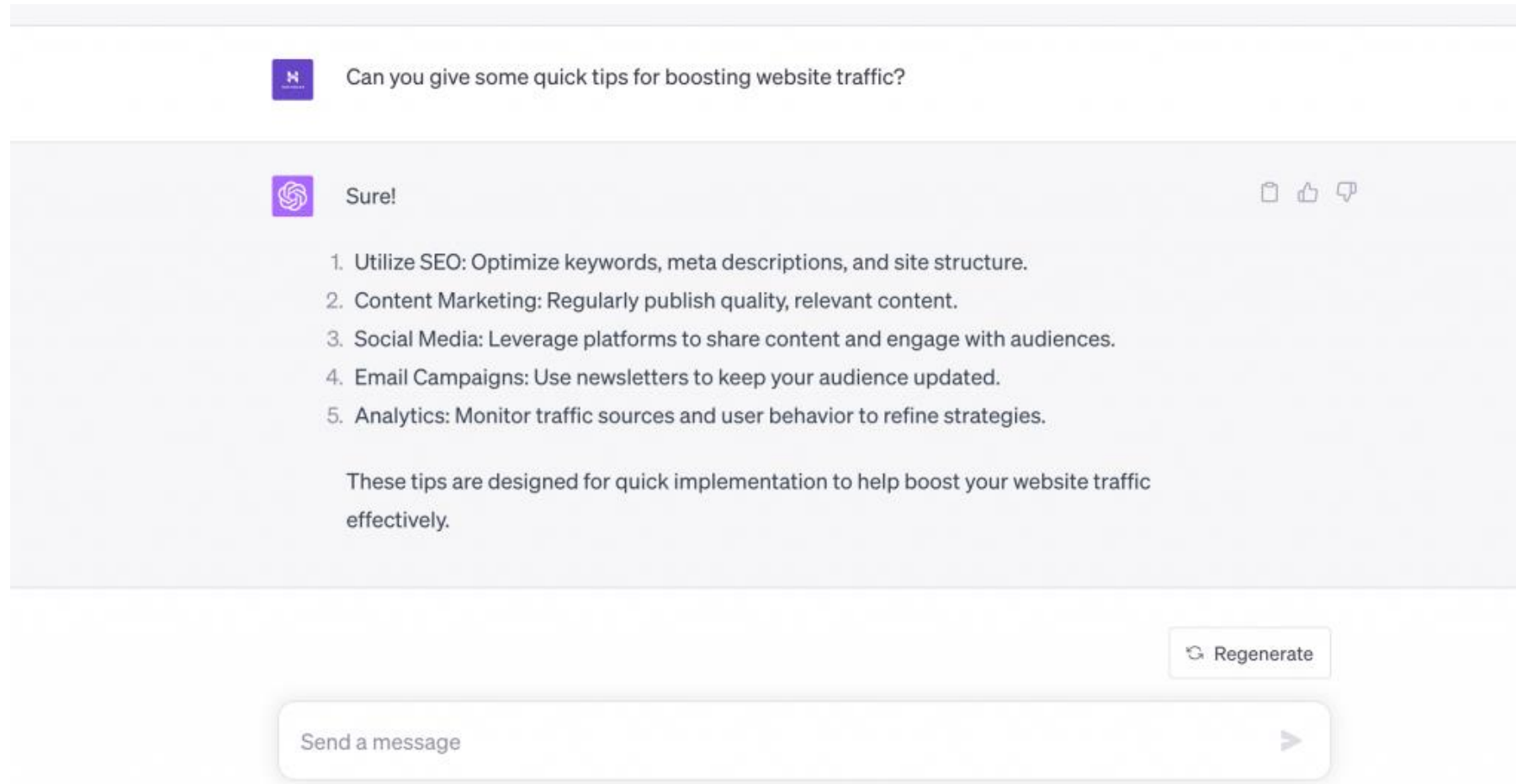
12 Interactive Storytelling and Role-Playing



13 Implicit Information Injection

- With Implicit Information Injection, you infuse context subtly so the AI model understands your needs without being explicitly told.
- **Strategies for Implicit Context**
- This technique can be particularly useful when you're seeking nuanced or tailored responses. For example, instead of saying, "Write this in a formal tone," you could use words like "elaborate" or "detailed" to guide the AI towards a more formal output.
- **Example**
- **Prompt** – Can you give some **quick tips** for boosting website traffic?

13 Implicit Information Injection



14 Language Translation with Contextual Nuance

- Multilingual content generation is not just about converting words from one language to another.
- Using prompt engineering, you can ensure that the AI considers the cultural or situational context, resulting in a more accurate and nuanced translation.
- **Improving Translation Accuracy With Context**
 - By adding cultural or situational hints within the prompt, you can guide the AI to provide a translation that fits the context. It is particularly useful in business communications, legal documents, or any text where a nuance can drastically alter the meaning.
 - **Prompt** – Translate the phrase 'She took the ball and ran with it' from English to French, keeping in mind that this is a business metaphor for taking charge of a project.

14 Language Translation with Contextual Nuance

 Translate the phrase 'She took the ball and ran with it' from English to French, keeping in mind that this is a business metaphor for taking charge of a project

 In a business context, the English phrase "She took the ball and ran with it" refers to someone taking initiative and executing a project successfully. A suitable French expression that captures this metaphorical meaning is:

- "Elle a pris le taureau par les cornes."

This French idiom literally translates to "She took the bull by the horns," which, like the English expression, signifies taking charge and making bold decisions to move a project or situation forward.

 What would've been the literal translation?

 The literal translation of the phrase "She took the ball and ran with it" into French would be:

- "Elle a pris le ballon et a couru avec."

This literal translation accurately represents the words but not the metaphorical or idiomatic meaning of the original English phrase, especially within a business context. Therefore, it might not convey the intended nuance if used in a French-speaking business setting.  Regenerate

Send a message 

15 Automatic Prompt Engineer

- Automatic Prompt Engineering (APE) is an advancement in the field of artificial intelligence that leverages new LLM capabilities to help the AI automatically generate and select instructions for itself.
- It transforms the task into a black-box optimization problem, using machine learning algorithms to generate and evaluate candidate solutions heuristically.
- An AI agent uses a similar method to break tasks and generate follow-up prompts automatically, completing given jobs with minimal human interaction. To learn more about the tool, check our guide on installing Auto-GPT.

- **APE Workflow Explained**

The APE workflow consists of five main steps:

1. You give the chatbot a specific job to do and show some examples.
2. The chatbot comes up with different ways to do the job, either by straightforward reasoning or by considering similar tasks it knows about.
3. These different methods are then tested in practice.
4. The chatbot rates how well each method worked.
5. The AI will then choose a better method and apply it.

15 Automatic Prompt Engineer

- **Benefits and Applications in Machine Learning**

When equipped with self-prompting capabilities, generative AI tools can streamline tasks from context-driven data analysis to automated customer service, eliminating the need for constant human-generated prompts.

15 Automatic Prompt Engineer

Scenario: Return Policy Information

Step 1: Initial Task Definition

The chatbot is tasked with helping customers understand the return policy for an eCommerce platform.

Step 2: Method Generation

The chatbot generates quick, straightforward questions to clarify the user's query. Questions could include "Did you purchase electronics?" or "How many days ago did you make the purchase?"

Step 3: Test Methods

The chatbot tries out these questions with different customers to evaluate their effectiveness.

Step 4: Method Rating

After a few interactions, the chatbot finds that asking "How many days ago did you make the purchase?" yields more accurate advice.

Step 5: Choose Best Method

Based on this success, the chatbot now prioritizes this question when discussing return policies.

Final Workflow:

User: "What's your return policy?"

Chatbot (Automated Prompt): "How many days ago did you make the purchase?"

User: "About a week ago."

Chatbot (Automated Prompt): "Our return policy allows returns within 30 days of purchase.

Would you like to proceed with a return?"

Benefits:

1. **Simplicity:** The chatbot quickly gets to the point.
2. **Efficiency:** The bot facilitates a solution with minimal back-and-forth, saving time for both parties.

This streamlined approach demonstrates how Automatic Prompt Engineering can enhance customer service efficiency in an eCommerce context.

🔄 Regenerate

Send a message

