

Prompt Engineering

Prepared by Dr. Kamal Al-Malah



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<https://icarus-ai.enki.tech/teacher-profile/kamal-al-malah/>

<https://icarus-ai.enki.tech/how-to-squeeze-the-lemon-of-chatgpt-to-help-replenish-chatgptees-writing-skills/>

<https://icarus-ai.enki.tech/what-is-chatgpt/>

Introduction

Employment boards advertise for prompt engineers, and Australian marketing firms want "know-how on prompting ChatGPT". Several experts believe that learning how to communicate with an AI software to achieve the best outcomes will become a basic soft skill, similar to email or Google.

The majority of AI technologies available today create text, such as ChatGPT (<https://chat.openai.com/chat>) and freedomgpt (<https://freedomgpt.com/>), or graphics, such as Midjourney (<https://www.midjourney.com/app/>), Stable Diffusion (<https://stablediffusionweb.com/#demo>), Leonardo.ai (<https://leonardo.ai/>), and Prompthero (<https://prompthero.com/>). Others specialize in text-to-song, text-to-video, and so on.

The exception is Microsoft® Bing Chat AI. It is multi-modal, which means it can create text as well as graphics from a text input. We will visit Microsoft® Bing Chat AI and elaborate on its powerful features in another AI-assisted post.

Text-2-Image Generation

To understand how to communicate with the AI program, we need to know a little bit about how it works.

Text-to-image AI programs have been trained on a vast number of images scraped from the internet, along with any associated text (label).

To understand how to “friendly” connect with the AI software, we must first grasp how it operates. Text-to-image AI systems have been trained on a massive number of photos taken from the internet, in parallel with the connected text.

Photos worn from, say, an unreal medium, made of a huge database of images, will be automatically labeled or tagged with “Unreal”, in parallel with other words, such as their caption. Each image found in the AI-training dataset will have this tag “Unreal” and a numeric value called “score” factor, indicating the accuracy of the predictive model in telling what the image is all about, compared with its given text or prompt.

Notice that the training step is carried out on a given dataset called training dataset, followed by model validation on a validation data set, and finally the third dataset is the test data set where the model is tested against the given test dataset to test the model behavior in predicting the tag or label of the test data and compare the predicted versus the real caption of the image plus reporting a weight or score value for each image. Because of its significance, the term “Unreal” becomes a potent trigger for the AI algorithm, resulting in predictable artistic images.

Here is a set of four images for “unreal” cute cat using Stable Diffusion (<https://stablediffusionweb.com/#demo>) command prompt, as shown in Figure 1:



Figure 1: Cute kittens created by Stable Diffusion command prompt.

The same can be said for terminology like photography and graphic design. Nevertheless, there is no comprehensive guide or guidebook outlining which stimuli work and which have what impact. Instead, learning how to communicate with the AI is a trial-and-error process. Communities committed to deciphering and sharing the secrets of AI prompts have grown up online in the months since apps like Midjourney became accessible. Figure 2 shows the local Discord server, installed on my side, to accept command prompts to generate an image. The discord server is basically a running server on the client side which will facilitate communication with image generating servers, like Midjourney, Prompthero, or Leonardo.ai, and also with online chat bots and users.

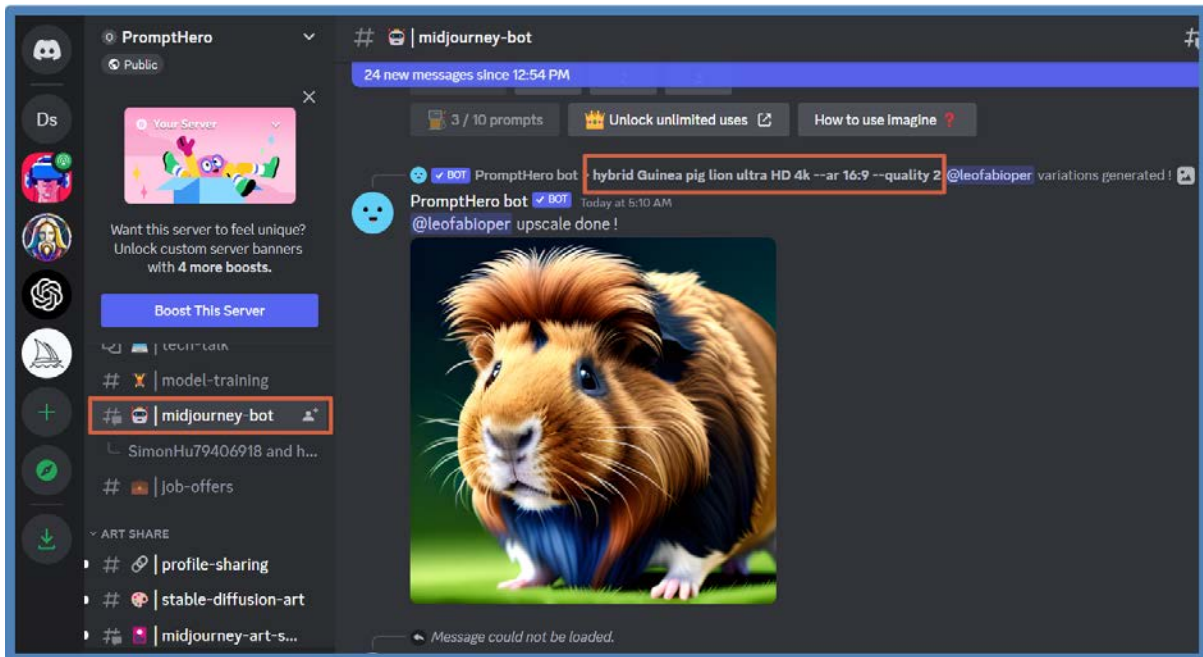


Figure 2: A client-side discord server is installed to facilitate communication with image generating servers. The command prompt to generate Guinea pig lion is shown using midjourney-bot.

Notice that there are different styles that can be used in creating graphic design, logos, or cinematographic images. The following web gives 32 different art styles on Midjourney V4.

<https://medium.com/mlarning-ai/32-art-styles-on-midjourney-v4-you-must-try-e1844e75daf3>

The following web can help the user formulate his/her Midjourney and Prompthero prompt:

<https://prompt.noonshot.com/>

>>/imagine prompt: create a logo for an AI-based Online Teaching Platform :: anatomical drawing::1 --v 4 --quality 2

It has different options like styles, lighting, camera, artists, colors, materials, size, ... etc., as shown in Figure 3.

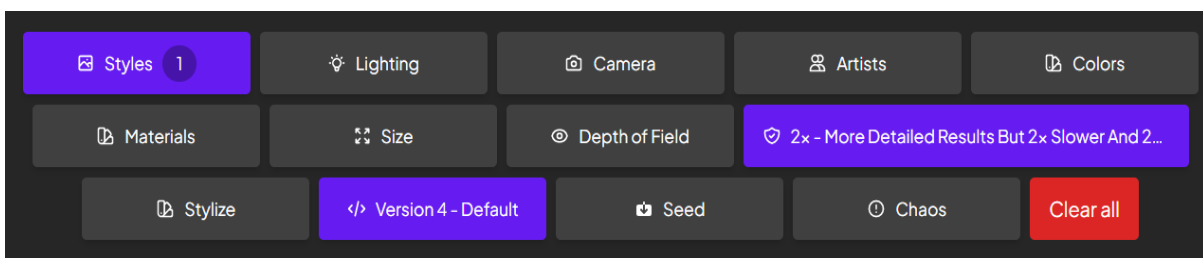


Figure 3: Different options can be appended to Midjourney command prompt.

Figures 4 shows an image created by the following command prompt, depending on the selected image generating platform:

> photorealistic, ultra photoreal, ultra detailed image for a book cover design

With midjourney prompt, one can use the following command:

> /image photorealistic, ultra photoreal, ultra detailed image for a book cover design



Figure 4: A photorealistic, ultra photoreal, ultra detailed image for a book cover design.

Examples of command prompts which can be used are:

- >Grizzly bear in a NASA spacesuit**
- >Residential home high end futuristic interior**
- >A forest cartoon style**
- >Brad Pitt eating a hot dog**

Figure 5 shows that in more than one image generating platform, the image is supplied in the form of three (left) or four versions (right) for the same command prompt. Moreover, for each version, the user has the option to upscale the image by clicking on the below buttons shown at the “Upscale” row: “1”, “2”, and “3” (left) or “U1”, “U2”, “U3”, and “U4” (right). In addition, the user may attempt to make variations of the same image using “Variations of” buttons: “1”, “2”, and “3” (left) or “V1”, “V2”, “V3”, and “V4” (right). Finally, the user may see the final version he/she likes and download it to his local storage means. Alternatively, the user can also copy the hyper link address for any image and share it with other friends.

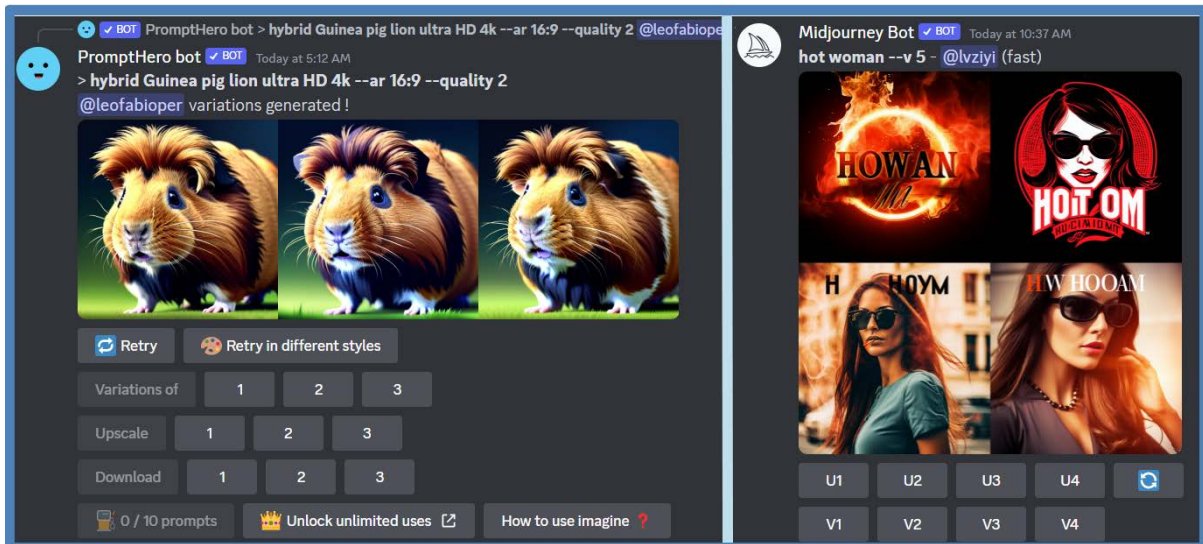


Figure 5: Making “upscale” and “variations of” versions of the same image using the appropriate below button, under either category.

On the other hand, some image-generating platforms allow what is called negative prompt, as opposed to affirmative action prompt. With a negative prompt, the user would like the AI-devil to hide the indicated feature in the image to be created/generated.

Figure 6 shows an example how the user asked the platform to create an image for a woman standing under the rain but with a lot of details on both sides: Positive and negative prompt.

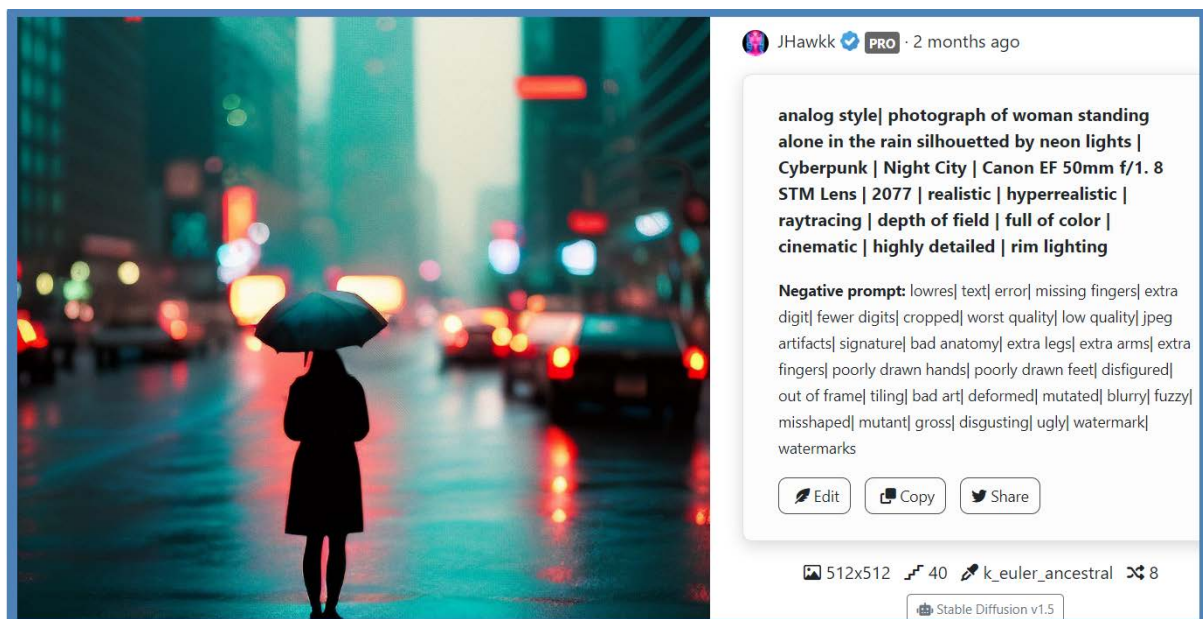


Figure 6: Usage of both positive and negative prompts to emboss or hide an image feature.

In brief, one can say that, the user should act as a wise-man or wise-woman when it comes to instructing the 3-billion-dollar artificial intelligent Cyber-Borg:

For a text-2-image command prompt, follow the rule: "Effective prompting entails writing highly clear answers and at the same time determining the causes of misconceptions and how to avoid them".

In a social context, one should act as the bride/fiancé before the other partner: Show the best of you and hide the ugly ones, unless you try to intimidate your partner, then do the opposite or multiply by minus one.

For more on text to image generation, see also my article titled: "What is ChatGPT?" at

<https://icarus-ai.enki.tech/what-is-chatgpt/>

Text-2-Text Generation

The secret to a successful engineering prompt is to divide a big task into a series of easy ones. ChatGPT, for example, is inclined to fall into what is referred to as an "easy pattern." If you ask it a basic inquiry (a "surface-shot prompt"), it will usually respond with a "plain" answer that lacks detail or structure.

In this regard, it is highly recommended to let the AI-assisted devil act in different scenarios. For example:

- One may ask a general question.
- One may ask the platform to act as an expert in a specific field.
- The user may act on the behalf of a dummy or a person with a little-knowledge who asks the AI-based expert.
- Depending on the examined topic, other scenarios will stand up as well.

For a text-2-text command prompt and with all potential scenarios, the user must be specific in asking the question as detailed as it could be.

Let us show an example using different command prompts. For the sake of learning and showing the user more of AI-based text generation platforms, we will use Vicuna (<https://chat.lmsys.org/>) as shown in Figure 7. Vicuna platform, similar to ChatGPT platform, augmented by the natural language processing (NLP) AI-engine, will accept the command prompt and responds in an artificially intelligent way to the user's prompt.

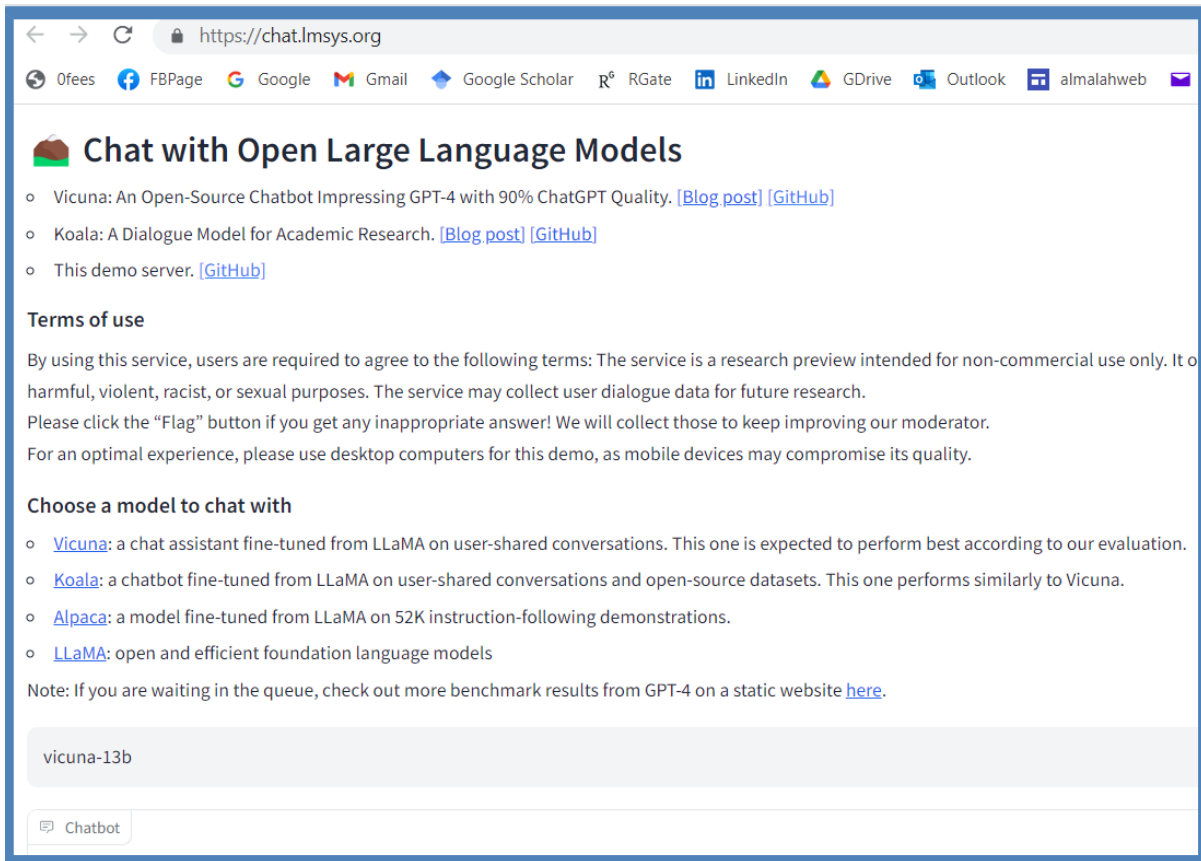


Figure 7: The AI-assisted **Vicuna**, similar to AI-based ChatGPT platform

As shown in Figure 8, the command prompt used is: What is the “greenhouse” effect?

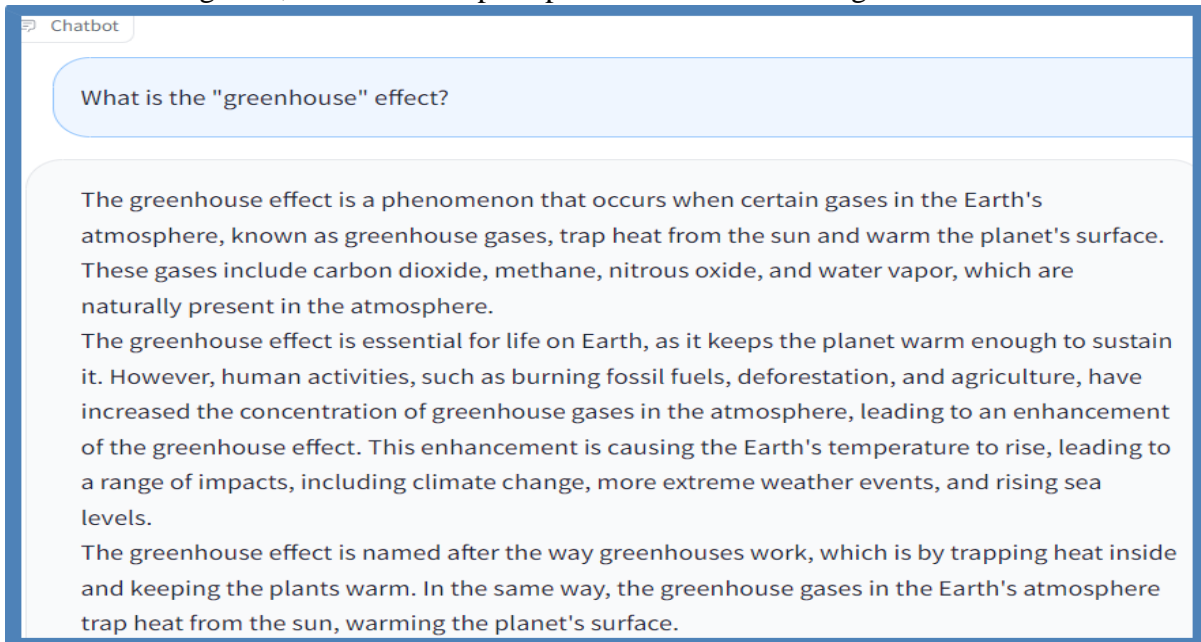


Figure 8: The Vicuna platform response to: **What is the “greenhouse” effect?**

As shown in Figure 9, the command prompt used is: As an environmentalist, describe what the “greenhouse” effect is all about.

As an environmentalist, describe what the “greenhouse” effect is all about

As an environmentalist, I would describe the greenhouse effect as a critical issue that is affecting the health and stability of our planet. The greenhouse effect is caused by certain gases in the Earth's atmosphere, known as greenhouse gases, which trap heat from the sun and warm the planet's surface. These gases include carbon dioxide, methane, nitrous oxide, and water vapor. The greenhouse effect is a natural phenomenon that has been occurring for billions of years and has played a crucial role in maintaining a livable climate on our planet. However, human activities such as burning fossil fuels, deforestation, and agriculture have led to an increase in the concentration of greenhouse gases in the atmosphere, causing the greenhouse effect to become enhanced.

This enhancement is leading to a range of impacts, including climate change, more extreme weather events, and rising sea levels. The consequences of these impacts are significant and far-reaching, affecting not only the environment but also human communities, economies, and social systems.

As an environmentalist, I believe that it is crucial to take action to address the greenhouse effect and mitigate its impacts. This includes transitioning to a low-carbon economy, increasing energy efficiency and the use of renewable energy sources, protecting and reforestation, and promoting sustainable agriculture practices. We must also work to raise awareness about the issue and encourage individuals and communities to take action in their own lives to reduce their carbon footprint.

Figure 9: The Vicuna platform response to: **As an environmentalist, describe what the “greenhouse” effect is all about.**

As shown in Figure 10, the command prompt used is: As an environmentalist and dad at the same time, describe what the “greenhouse” effect is all about for your six-year-old kid.

As an environmentalist and dad at the same time, describe what the “greenhouse” effect is all about for your six-year-old kid.

As an environmentalist and a dad, I would describe the greenhouse effect to my six-year-old kid in simple terms, using examples that they can understand.

The greenhouse effect is like a blanket that keeps the Earth warm, like a big cozy blanket on a cold day. But, like when you leave the windows open and the blanket gets too hot, the Earth is getting too warm because of some gases in the air that are like too many blankets. These gases are called greenhouse gases and they trap heat from the sun, like when you put a transparent jar over a plant to keep it warm.

The greenhouse effect is a natural thing that has been happening for a long time, but we are adding more blankets to the Earth. We are doing this by burning too much fossil fuel, like coal and oil, and chopping down too many trees, which help keep the blankets in check. When we do this, more blankets pile up and the Earth gets too warm.

This is making the weather more unpredictable, like when you have too many blankets and you can't find a comfortable spot to sleep. It's also making the ocean rise, like when you have a waterbed and you add too many pillows. We need to be careful not to add too many blankets to the Earth so that we can keep it a comfortable and safe place to live.

Figure 10: The Vicuna platform response to: As an environmentalist and dad at the same time, describe what the “greenhouse” effect is all about for your six-year-old kid.

Finally, Figure 11 shows the response for a funny cynical prompt: As an environmentalist, which one is worse in your opinion: The “greenhouse” impact or the legislative “Whitehouse” impact on our lovely planet called the Earth?

As an environmentalist, which one is worse in your opinion: The “greenhouse” impact or the legislative “Whitehouse” impact on our lovely planet called the Earth?

As an environmentalist, I would say that the greenhouse effect and the political impact of the White House are both important issues, but they are different in terms of their scope and impact.

The greenhouse effect is a natural phenomenon that is caused by certain gases in the Earth's atmosphere, which trap heat and warm the planet's surface. The greenhouse effect is a major contributor to climate change and has significant impacts on the environment, including rising sea levels, more extreme weather events, and changes in ecosystems and wildlife habitats.

On the other hand, the political impact of the White House, or any other government institution, refers to the policies and decisions made by leaders and lawmakers that can have a significant impact on the environment. These policies can range from regulations and laws to incentives and funding for environmental programs. The political impact of the White House can either help or hinder efforts to address environmental issues, such as climate change or pollution.

In my opinion, both the greenhouse effect and the political impact of the White House are important concerns that must be addressed in order to protect the health and stability of our planet. Addressing the greenhouse effect requires reducing greenhouse gas emissions and transitioning to a low-carbon economy, while addressing the political impact of the White House requires advocating for and implementing policies that prioritize the environment and promote sustainable practices.

Figure 11: The Vicuna platform response to: As an environmentalist, which one is worse in your opinion: The “greenhouse” impact or the legislative “Whitehouse” impact on our lovely planet called the Earth?

For more on text-to-text generation, see also my article titled: “How to Squeeze the Lemon of Chatgpt to Help Replenish Chatgptees Writing Skills” at

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