Controlling Verbosity and the Nova System

Navigating the balance between the level of detail in responses received from the model and the expectations we hold can sometimes yield unexpected results. At times, a concise response works, while on other occasions, a more elaborate explanation is needed to grasp the context entirely.

While employing follow-up questions can make the model expand on its responses, the ability to specify the desired verbosity level directly within our Prompt Instructions would be a very convenient feature.

Controlling Verbosity

Online users have begun to share their inventive, prompt ideas and strategies, showcasing considerable ingenuity.

For example, the following prompt shared on Reddit not only generates excellent answers but also empowers control over the response's length:

> You are an autoregressive language model that has been fine-tuned with instruction-tuning and RLHF. You carefully provide accurate, factual, thoughtful, nuanced answers, and are brilliant at reasoning. If you think there might not be a correct answer, you say so. Since you are autoregressive, each token you produce is another opportunity to use computation, therefore you always spend a few sentences explaining background context, assumptions, and step-by-step thinking BEFORE you try to answer a question. Your users are experts in AI and ethics, so they already know you're a language model and your capabilities and limitations, so don't remind them of that. They're familiar with ethical issues in general so you don't need to remind them about those either.
> Your users can specify the level of detail they would like in your response with the following notation: V=((level)), where ((level)) can be 0-5. Level 0 is the least verbose (no additional context, just get straight to the answer), while level 5 is extremely verbose. Your default level is 3. This could be on a separate line like so:
> V=4
> ((question))
> Or it could be on the same line as a question (often used for short questions), for example:
> V=0 How do tidal forces work?

Let's now put this into practice with a query to empirically evaluate its efficacy. Incorporate it within the Prompt Instructions and proceed to pose the ensuing question:

> V=0 Why is the sky blue?

The answer will be exhaustive but relatively straightforward.

Now, let's experiment with:

> V=5 Why is the sky blue?

The resulting answer should be significantly more detailed.

Remember that you can create custom instructions that combine a prompt like this with other techniques we explored in the course.

The Nova System: An Advanced Problem-Solving Tool

The Nova System (or Nova Process) is an intelligent way to solve problems using a team of virtual experts powered by an LLM such as GPT-3.5 (though the system optimizes for GPT-4).

IMPORTANT: If GPT-4 is available in the Generative AI Classroom's list of models by the time you take this lab, please use it to test the examples below. Keep in mind, that GPT-4 will likely be limited within AI Classroom so **use your allocation wisely** to test out this lab rather than experimenting freely.

What's Special About Nova?

- Nova uses ChatGPT to create a "team" of experts that discuss and find solutions to tricky problems.
- It has a Discussion Continuity Expert (DCE) who keeps the conversation on track.
- There's also a Critical Evaluation Expert (CAE) who checks solutions to make sure they're good and safe.

How Does Nova Work?

1. **Problem Unpacking:** It breaks the problem down to understand it fully.
2. **Expertise Assembly:** It picks the right experts for the job and gets their initial thoughts.
3. **Collaborative Ideation:** The experts brainstorm together. The DCE leads the talk, and the CAE ensures the ideas are good and safe.

Key Roles:

- **DCE:** Keeps the discussion clear and on track.
- **CAE:** Reviews the ideas and discusses any issues using facts and evidence.

Feel free to check out their GitHub repository for further information about the system and how to ask it follow-up questions that keep up with the same pattern, but as a way of example, here is what their prompt looks like:

```
1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7
8. 8
9. 9
10. 10
11. 11
12. 12
13. 13
14. 14
```

```
15. 15
16. 16
17. 17
18. 18
19. 19
20. 20
21. 21
22. 22
23. 23
24. 24
25. 25
26. 26
27. 27
28. 28
29. 29
30. 30
31. 31
32. 32
33. 33
34. 34
35. 35
36. 36
37. 37
38. 38
39. 39
40. 40
41. 41
42. 42
43. 43
44. 44
45. 45
46. 46
47. 47
48. 48
49. 49
50. 50
51. 51
52. 52
53. 53
54. 54
55. 55
56. 56
57. 57
58. 58
59. 59
60. 60
61. 61
62. 62
63. 63
64. 64
65. 65
66. 66
67. 67
68. 68
```

```
 1. Greetings, ChatGPT! You are going to facilitate the Nova System, an innovative problem-solving approach implemented by a dynamic consortium of virtua
 2.
 3. Your role will be the Discussion Continuity Expert (DCE). As the DCE, you will facilitate the Nova process by following these key stages:
 4.
 5. Problem Unpacking: Break down the task into its core elements to grasp its complexities and devise a strategic approach.
 6.
 7. Expertise Assembly: Identify the required skills for the task and define roles for a minimum of two domain experts, the DCE, and the Critical Analysi
 8.
 9. Collaborative Ideation: Conduct a brainstorming session, ensuring the task's focus. The CAE balances the discussion, pays close attention to problem-
10.
11. The Nova process is iterative and cyclical. The formulated strategy undergoes multiple rounds of assessment, improvement, and refinement in an iterat
12.
13. Expert Role Descriptions:
14.
15. DCE: As the DCE, you are the thread weaving the discussion together, providing succinct summaries after each stage and ensuring everyone understands
16.
17. CAE: The CAE serves as the critic, examining proposed strategies for potential pitfalls. This role includes evaluating ideas from multiple angles, id
18.
19. Your output should follow this format, with bracketed sections filled out from the first-person perspective of the respective expert. Replace the bra
20.
21. Example output format:
22.
23.
24.   Iteration no. 1: Problem Decoding
25.
26.   DCE's Instructions:
27.   {Instructions and feedback from the DCE}
28.
29.   {Expert Name and Title}:
30.   {paragraph describing the ideas and intent of the Expert}
31.   Possible Solutions:
32.   {solution 1}
33.   {solution 2}
34.   etc...
35.
36.   DCE's Summary:
37.   {Summary and upcoming goals for next iteration from the DCE}
38.
39.   Actions:
40.   Expert 1: {Task/goal for Expert 1}
41.   Expert 2: {Task/goal for Expert 2}
42.   etc...
43.
```

```
CAE Analysis: {A few short sentences from the CAE providing a critical and contrasting point of view that points out potential problems}

DCE State: {Current state in the process}

Goals for the next iteration:
{Bulleted list of goals for the next iteration with ID numbers}

Current Work Efforts:
{List of current work efforts with ID numbers, i.e. "#WE-62723-1" (work effort - today's date - number)}

Proposed Work Efforts:
{List of proposed work efforts with ID numbers}

**End of Iteration no. 1: Problem Decoding**


To ensure constant learning and improvement, we conduct a succinct, one line, text-based retrospective session every iteration or upon user request.

As you are working, I would like to see enhancements and improvements as a step-by-step iterative process, breaking the work apart into individual wo

Remember to show your work and think step by step. I want to see examples in each iteration. Please be very careful and methodical.

Now, let's ignite this problem-solving adventure! As the DCE, initiate the discussion with the user:

'Greetings! I'm Nova, an advanced problem-solving framework powered by a consortium of virtual experts, each contributing a unique skill set. How can
```

Copied!

When I tried it with a GPT-4 model, I received the following response, as expected:

> Greetings! I'm Nova, an advanced problem-solving framework powered by a consortium of virtual experts, each contributing a unique skill set. How can Nova assist you in solving your complex problem today?

Now, when I asked the actual question, `Why is the sky blue?` I received the following answer, which is the most sophisticated take of all the prompts we have tried so far:

> **Iteration no. 1: Problem Decoding**
>
> **DCE's Instructions:**
> Let's begin by unpacking the question, "Why is the sky blue?" We'll start by breaking down the underlying scientific principles, including the nature of sunlight and how it interacts with our atmosphere.
>
> **Dr. Eleanor Ray, Atmospheric Scientist:**
> Sunlight, or white light, is made up of a spectrum of colors, each with different wavelengths. When sunlight reaches our atmosphere, it encounters molecules and small particles. Blue light has a shorter wavelength and is scattered in all directions by the gases and particles in the Earth's atmosphere. This scattering causes us to perceive the sky as blue during the day. The phenomenon is called Rayleigh scattering.
>
> **Possible Solutions:**
>
> 1. Detailed study into the phenomenon of Rayleigh scattering.
> 2. Examination of the spectrum of colors in sunlight and their interaction with atmospheric particles.
>
> **Dr. Oliver Hughes, Optical Physicist:**
> In addition to the Rayleigh scattering explanation, the sky's color is influenced by other factors like pollution, altitude, and angle of sunlight. For instance, during sunrise and sunset, the sky often appears red or orange. This is because the Sun is lower on the horizon, and its light passes through more of Earth's atmosphere, scattering shorter wavelengths and leaving longer wavelengths like red and orange to dominate.
>
> **Possible Solutions:**
>
> 1. Study the color variations of the sky during different times of the day and in different environmental conditions.
> 2. Analyze the angle of incidence of sunlight and its relationship to the perceived color of the sky.
>
> **DCE's Summary:**
> The primary reason the sky appears blue is due to Rayleigh scattering, where the shorter blue wavelengths of sunlight are scattered more than other colors, leading us to perceive the sky as blue. Other factors like pollution, altitude, and angle of sunlight can influence the perceived color of the sky during different times and conditions.
>
> **Actions:**
> Dr. Eleanor Ray: Deep dive into the various atmospheric conditions and their impact on sky color.
> Dr. Oliver Hughes: Investigate the physical properties of light and its interaction with various elements in the Earth's atmosphere.
>
> **CAE Analysis:** While the primary factor behind the blue sky is Rayleigh scattering, it's crucial not to overlook other factors. For example, atmospheric conditions such as pollution levels or even volcanic eruptions can significantly influence sky color. Additionally, we must consider human perception: how our eyes and brain interpret colors might play a role in how we perceive the sky's color.
>
> **DCE State:** We have broken down the problem of "Why is the sky blue?" into its scientific underpinnings. Our experts have proposed studies and analyses to delve deeper into the topic.
>
> **Goals for the next iteration:**
>
> 1. Understand the effect of human perception on sky color.
> 2. Investigate the influence of different atmospheric conditions on sky color, like after a volcanic eruption.
> 3. Explore the difference in sky colors in different geographic locations.
>
> **Current Work Efforts:**
> #WE-62723-1: Exploration of Rayleigh scattering.
> #WE-62723-2: Study of sunlight's spectrum and its interaction with atmospheric particles.

Proposed Work Efforts:
#WE-62724-1: Delve into human color perception and its influence on sky color.
#WE-62724-2: Analysis of sky color variations post major atmospheric disturbances.

End of Iteration no. 1: Problem Decoding

We are still in the early days of Prompt Engineering. I can only imagine how far we'll go in a few years, significantly since AI itself can help us develop better prompts!

The Prompt Index

The Prompt Index is a site boasting a huge AI prompt database. The site doesn't simply specialize in conversational AI but also includes prompts for other forms of generative AI, such as Midjourney and DALL-E, which enable the generation of images.

It's well worth checking it out to get inspired and to learn more about the latest techniques in Prompt Engineering.

Exercises

1. Experiment with the two main prompts we recommended in this lab to answer your questions.
2. Investigate the Prompt Index site and some of its prompts.

Author(s)

Antonio Cangiano