

Project 2 – Crafting the Perfect Prompt

Objective – Hone your prompt engineering skills by designing the perfect prompt

Choose a topic and create 3 versions – basic, refined, role-based prompt

Using ChatGPT, I ask it to explain an eclipse using the above definitions to optimize the output

Basic prompt – define an eclipse

ChatGPT Response - An **eclipse** is an astronomical event that occurs when one celestial body moves into the shadow of another, blocking its light.

There are two main types of eclipses:

1. **Solar Eclipse** – Occurs when the Moon moves between the Earth and the Sun, partially or completely blocking sunlight from reaching Earth.
2. **Lunar Eclipse** – Happens when the Earth moves between the Sun and the Moon, causing Earth's shadow to fall on the Moon, making it appear darkened or reddish.

Eclipses can be **partial, total, or annular**, depending on the alignment of the celestial bodies.

Refined prompt – define an eclipse and include explanation of each type

ChatGPT Response - An **eclipse** is an astronomical event that occurs when one celestial body moves into the shadow of another, temporarily blocking light from reaching it. Eclipses happen when the Sun, Moon, and Earth align in a specific way, causing one body to cast a shadow on another.

Types of Eclipses

1. Solar Eclipse

A **solar eclipse** occurs when the Moon moves between the Earth and the Sun, blocking all or part of the Sun's light. This casts a shadow on Earth, causing temporary darkness in the affected areas.

There are three types of solar eclipses:

- **Total Solar Eclipse** – The Moon completely covers the Sun, and only the solar corona (outer atmosphere) is visible. This happens when the Moon is at the right distance to fully block the Sun.
- **Partial Solar Eclipse** – The Moon covers only part of the Sun, creating a crescent-shaped Sun as seen from Earth.
- **Annular Solar Eclipse** – The Moon is too far from Earth to completely cover the Sun, leaving a bright ring (annulus) of sunlight visible around the Moon.

2. Lunar Eclipse

A **lunar eclipse** occurs when the Earth moves between the Sun and the Moon, casting a shadow on the Moon. This can only happen during a full moon. There are three types of lunar eclipses:

- **Total Lunar Eclipse** – The entire Moon enters Earth's umbra (the darkest part of the shadow), turning a reddish color due to Earth's atmosphere scattering sunlight. This is sometimes called a "Blood Moon."
- **Partial Lunar Eclipse** – Only part of the Moon moves into Earth's umbra, causing a section of it to darken.
- **Penumbral Lunar Eclipse** – The Moon passes through Earth's penumbra (the lighter outer part of the shadow), causing a slight dimming that is often difficult to notice.

Eclipses do not happen every month because the Moon's orbit is slightly tilted relative to Earth's orbit around the Sun, so perfect alignment is rare.

Role-based prompt - you're to play the role of an astronomy professor, providing a lecture to first-year astronomy students. define an eclipse and examples of each kind.

ChatGPT Response –

What is an Eclipse?

An **eclipse** occurs when one celestial body moves into the shadow of another, temporarily obscuring it from view. This phenomenon is the result of an alignment of three celestial objects—typically the Sun, the Earth, and the Moon—where one blocks the light of another.

There are **two primary types** of eclipses:

1. **Solar Eclipse** – When the Moon blocks sunlight from reaching Earth.
2. **Lunar Eclipse** – When the Earth blocks sunlight from reaching the Moon.

Now, let's explore each type in detail.

1. Solar Eclipse

A **solar eclipse** occurs when the Moon moves directly between the Sun and Earth, casting its shadow on Earth's surface. This can only happen during a **new moon** phase. Depending on the Moon's distance from Earth and its position in orbit, we observe different types of solar eclipses:

- **Total Solar Eclipse** – The Moon completely covers the Sun, revealing only the Sun's outer atmosphere, known as the **corona**. This is a breathtaking sight, but totality lasts only a few minutes.
Example: The August 21, 2017, solar eclipse was visible across the United States.
- **Partial Solar Eclipse** – The Moon covers only a portion of the Sun, creating a crescent-shaped Sun. Observers outside the path of totality see this effect.
Example: The October 25, 2022, partial eclipse was visible in parts of Europe, Asia, and Africa.
- **Annular Solar Eclipse** – The Moon is too far from Earth to fully cover the Sun, leaving a bright ring (or annulus) of sunlight around it.
Example: The "Ring of Fire" eclipse on October 14, 2023, was visible in the Americas.

⚠ **Safety Note:** Never look directly at a solar eclipse without proper eye protection!

2. Lunar Eclipse

A **lunar eclipse** occurs when the Earth moves between the Sun and the Moon, casting its shadow on the Moon. Unlike solar eclipses, which are only visible in certain locations, a lunar eclipse can be seen from anywhere on Earth where the Moon is above the horizon. Lunar eclipses occur only during a **full moon**. There are three types:

- **Total Lunar Eclipse** – The entire Moon passes through Earth's umbra (the darkest part of its shadow), turning a reddish color due to sunlight scattering in Earth's atmosphere. This is sometimes called a "**Blood Moon**."
Example: The total lunar eclipse on May 16, 2022, was visible in the Americas, Europe, and parts of Africa.
- **Partial Lunar Eclipse** – Only part of the Moon moves into Earth's umbra, causing a portion to darken while the rest remains illuminated.
Example: The November 19, 2021, partial lunar eclipse lasted over six hours, making it the longest in nearly 600 years.
- **Penumbral Lunar Eclipse** – The Moon passes through the Earth's penumbra (the lighter outer shadow), causing a subtle dimming that can be difficult to notice.

Example: The penumbral lunar eclipse on February 5, 2023, was visible in Europe, Africa, and Asia.

Why Don't We See Eclipses Every Month?

You might wonder—since the Moon orbits Earth every month, why don't we see a solar and lunar eclipse every month? The reason lies in the **tilt of the Moon's orbit**. The Moon's orbit around Earth is tilted by about **5 degrees** relative to Earth's orbit around the Sun. This means that most of the time, the Moon's shadow misses the Earth (for solar eclipses), or the Earth's shadow misses the Moon (for lunar eclipses).

Eclipses only happen when the Sun, Earth, and Moon align at specific points, known as the **lunar nodes**. These alignments occur **a few times per year**, leading to eclipse seasons.

Final Thoughts

Eclipses have fascinated humans for centuries, inspiring myths, scientific discoveries, and even modern research on the Sun and Moon. Understanding eclipses helps us appreciate celestial mechanics and the intricate dance of the Sun, Earth, and Moon.



Key Takeaways:

- ✓ A **solar eclipse** occurs when the Moon blocks the Sun; a **lunar eclipse** happens when the Earth blocks sunlight from reaching the Moon.
- ✓ Eclipses occur because of the precise alignment of celestial bodies.
- ✓ We don't see eclipses every month because of the Moon's tilted orbit.
- ✓ **Never** look at a solar eclipse without proper eye protection.

From the above responses, one can note the increase in the level of detail as the prompt used to generate responses is refined. This illustrates that prompts that are specific tend to generate better results.

Project 4 – Advance Prompt Techniques

Objective – Experiment with advanced strategy to maximize LLM performance

Prompt – Your role is a storyteller. Write a story, in 300 words, about a flower that overcame a speech impediment to become the greatest storyteller of all time.

Response- The Whispering Blossom

In the heart of an enchanted meadow, where the wind carried secrets and the trees hummed lullabies, there bloomed a small daisy named Lilia. Unlike the other flowers that swayed and gossiped freely with the breeze, Lilia had a problem—whenever she tried to tell a story, her petals trembled, and her words tangled like vines.

The roses teased her, the tulips giggled, and even the sunflowers, towering and wise, gave her sympathetic glances. But Lilia dreamed of becoming the greatest storyteller the meadow had ever known.

One evening, as the golden light faded, an old oak tree rustled its leaves and whispered, *"Stories are not just spoken, little one. They are felt."* Inspired, Lilia began listening—truly listening—to the world around her. She heard the laughter of the brook, the secrets of the fireflies, and the lullabies of the night wind.

Determined, she practiced in solitude, speaking with the moon when no one else listened. At first, her words wobbled like a newborn butterfly, but slowly, they found rhythm. Her voice, though soft, carried warmth.

One day, a great storm tore through the meadow, leaving the flowers shaken and afraid. As the rain cleared, Lilia stepped forward. “Let me tell you a story,” she said, her voice trembling but steady. She wove tales of resilience, of hope, of the dawn that always followed the night.

And the flowers listened.

From that day on, Lilia became the meadow’s greatest storyteller—not because her words were perfect, but because they were real. And when the wind carried her stories beyond the meadow, they became legends whispered in every corner of the world.

For the best stories, after all, come from those who dare to speak.

Findings – advanced technique used is role play. Based on the advanced prompt, the output generated was concise. The moral of the story was clear and easy to understand, for the story follows a logical steps in how the flower, Lilia, overcome its speech impediment to become a great story teller.