

## Part 1- Optimizing Prompts

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.

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#### 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!

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#### 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.*

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### 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.

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### 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.

## Part 2 - Debugging Prompt Failures

### 1. Write a complex or intentionally vague prompt to see how the AI responds

#### a. Prompt – explain eclipse and joke

##### i. Respond – What is an Eclipse?

An **eclipse** is an astronomical event that occurs when one celestial body moves into the shadow of another, blocking its light. The two main types of eclipses are:

**Solar Eclipse** – When the Moon moves between the Sun and Earth, blocking sunlight from reaching Earth.



**Lunar Eclipse** – When the Earth moves between the Sun and the Moon, casting a shadow on the Moon.


These events are breathtaking, scientifically fascinating, and have been studied for centuries!

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#### Eclipse Joke

Why didn't the Sun go to college?

Because it already had a million degrees!  

(And the Moon just *shadowed* it for a while!) 

- ### 2. Analyze the response
- Based on the generated output, it separated the prompt, explaining what an eclipse is and a related joke, even though it was not stated in the original prompt.

3. **Debug the prompt** – the prompt has two parts, explain an eclipse and write a joke. Since the prompt did not specify what kind of joke to write, it based its response to the first half of the question.
4. **Test the refined prompt and note the difference in the output** – The prompt was to tell five jokes in relation to an eclipse. Here is the output
  - a. **Why did the Moon break up with the Sun?**  
Because it needed some *space*! 🌌 😊
  - b. **What did the Sun say to the Moon during an eclipse?**  
"You complete me... but only for a few minutes!" 🌞 🌑 💔
  - c. **Why did the astronomer bring a ladder to the eclipse?**  
Because he wanted to get a *better view* of the *dark side*! 🌑 🪜 😊
  - d. **How does the Moon throw a party during an eclipse?**  
It makes sure it's *totally lit* before getting *shadowed*! 🎉 🌑 ✨
  - e. **Why do solar eclipses make great musicians?**  
Because they always know how to *cover* a hit! 🎸 🎤 😊 ➡ 🌑

Hope these make you smile! 😊 🌑

## Part 3 – Evaluating Prompt Effectiveness

**Task** – use evaluation metrics to assess the quality of AI responses and refine prompts based on feedback

**Create a prompt for a specific task** – I would like to learn German and French to communicate with my friends. can you create a schedule to learn both languages in 4 months?

### Output - 4-Month German & French Learning Schedule

**Time Commitment:** ~1.5–2 hours per day (split between both languages)

#### Month 1: Foundations & Basic Conversations

- **German (45 min/day)**
  - Learn basic greetings, numbers, days, and common phrases.
  - Focus on sentence structure and simple verbs (sein, haben, gehen, kommen).
  - Practice listening with beginner podcasts (e.g., *Slow German*).
  - Use apps like Duolingo, Anki (flashcards), and LingQ.
  - Speak with native speakers or language partners (HelloTalk, Tandem).
- **French (45 min/day)**
  - Master common phrases, introductions, and basic verbs (être, avoir, aller).
  - Learn pronunciation rules and essential grammar (articles, gender).
  - Listen to beginner-level French podcasts (e.g., *Coffee Break French*).
  - Practice with flashcards (Anki) and apps like Duolingo.
  - Watch simple French videos with subtitles (YouTube: *Learn French with Alexa*).

#### Month 2: Expanding Vocabulary & Grammar

- **German**
  - Learn common adjectives, prepositions, and modal verbs (können, müssen, sollen).
  - Start reading simple texts (e.g., *Café in Berlin* book series).
  - Engage in short spoken conversations with language partners.
  - Watch German cartoons or news with subtitles (*DW Nachrichten*).
- **French**
  - Expand vocabulary with food, travel, and daily life topics.

- Learn past and future tenses (*passé composé, futur proche*).
- Read short stories (e.g., *Le Petit Nicolas*).
- Watch French TV series with subtitles (*Extra French*).
- Practice speaking full sentences aloud.

### Month 3: Intermediate Proficiency & Listening Comprehension

- **German**
  - Work on complex sentence structures (subordinating conjunctions, relative clauses).
  - Read intermediate texts (e.g., *News in Slow German*).
  - Watch movies with subtitles and try to summarize them in German.
  - Join German-speaking online communities or Discord servers.
- **French**
  - Focus on the **subjunctive mood** and more complex tenses.
  - Start listening to French radio or news (e.g., *France 24*).
  - Read French blogs or online articles and summarize them.
  - Start writing short essays or journal entries in French.

### Month 4: Fluency Boost & Real-Life Practice

- **German & French**
  - Have 30-minute conversation sessions in each language daily.
  - Watch full-length movies or documentaries without subtitles.
  - Read books and news articles to improve comprehension.
  - Write daily journal entries in both languages.
  - Participate in online forums or Reddit communities in German/French.

### Output Score:

- Relevance – 3
- Completeness – 4
- Clarity – 5
- Creativity – 3
- Efficiency – 3.5
- **Total score – 18.5**

### Refined the prompt based on the evaluation and generate a new response

**Refined prompt** - I am at an A2 level for both German and French, and I would like to attain a B1. I don't like using apps to learn languages. Can you generate a 4-month study plan based on my level.

### Output - 4-Month B1 Study Plan for German & French

**Goal:** Improve grammar, vocabulary, fluency, and comprehension to reach **B1 level**.

**Time Commitment:** ~2 hours per day (1 hour per language).

### 🌸 Month 1: Strengthening Grammar & Expanding Vocabulary

- **German:**
  - Master **past tenses** (Präteritum vs. Perfekt).
  - Expand knowledge of **modal verbs** in past tense (können → konnte, müssen → musste).
  - Read simple short stories (e.g., *Café in Berlin*).
  - Listen to **slow spoken German news** (*DW Nachrichten in einfacher Sprache*).
  - **Write 5-6 sentences daily** about your day in German.
- **French:**

- Master **past tenses** (*passé composé* vs. *imparfait*).
- Work on **common prepositions & pronouns** (*y, en, lequel, dont*).
- Read **short news articles** (e.g., *Le Monde* or *RFI Facile*).
- Listen to **French radio or podcasts** (*France Culture, RFI*).
- **Write a short paragraph daily** describing an event from your day.

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## ✚ Month 2: Enhancing Listening & Speaking Skills

- **German:**
  - Focus on **subordinating conjunctions** (*weil, obwohl, dass*).
  - Improve **adjective endings** and complex sentence structures.
  - Watch German movies with **German subtitles** (*Tatort, Dark*).
  - **Have 2 short conversations per week** with native speakers (Tandem partners, Italki, Meetup).
- **French:**
  - Work on **relative pronouns** (*qui, que, dont*).
  - Learn about **future tenses** (*futur proche & futur simple*).
  - Watch **French YouTube channels** (e.g., *InnerFrench, Français Authentique*).
  - **Join French-speaking forums** (Reddit r/France, r/French).
  - **Speak with native speakers** twice a week.

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## ✚ Month 3: Advanced Grammar & Real-World Usage

- **German:**
  - Work on **word order in complex sentences**.
  - Learn **Konjunktiv II** (subjunctive for polite speech & hypothetical situations).
  - Read **longer news articles** (*Die Zeit, Der Spiegel*).
  - Listen to **authentic German podcasts** (*Easy German, Slow German*).
- **French:**
  - Study **subjunctive mood** (*le subjonctif*).
  - Improve **idiomatic expressions** used in daily speech.
  - Read **French opinion pieces** (*Le Figaro, Le Monde*).
  - Watch **French stand-up or TV shows** (*Dix Pour Cent, Kaamelott*).

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## ✚ Month 4: Fluency Boost & Real Conversations

- **German & French:**
  - **Speak daily (15-20 min per language)**.
  - **Write daily (short essays, journal entries, reflections)**.
  - **Read one full book** in each language (choose a B1-level book).
  - **Immerse yourself** (switch your phone, social media, and daily habits into French/German).
  - **Watch a full movie without subtitles**.

### Output Score:

- Relevance – 5
- Completeness – 4.5
- Clarity – 5
- Creativity – 4.5
- Efficiency – 4.5
- **Total score – 23.5**

## Part 4 – Creative Application

**Task – apply everything you’ve learned to solve a real-world problem.**

**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.