

Optimizing AI Interactions: Techniques in Prompt Engineering for Enhanced Model Performance

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Introduction to Prompt Engineering

- ▶ Prompt engineering is an Art. The more focused we are into prompting, the more effective we get output
- ▶ Practicing prompt engineering will
 - ▶ Enhance AI Model Performance and Usability
 - ▶ Help AI Systems to understand user Intent effectively



Different AI Models

- ▶ AI Model Types
 - ▶ Language Models
 - ▶ GPT-3
 - ▶ GPT4
 - ▶ Image Generation Models
 - ▶ DALL-E

Every AI Model generates outputs based on patterns in the data they have been trained on.
Prompt Quality directly provides user quality results



Role of Prompts in working with AI Models

- ▶ A prompt is an input or query a user asks an AI Model
- ▶ Variable prompts give us variable results, even if the question is the same
- ▶ Clear, Specific, Context Rich inputs are required for best response
- ▶ Structured prompts produce best results



Different Types of Prompts

- ▶ **Instructional Prompts**

- ▶ Guide AI to produce a specific format or style
 - ▶ Example: Write me a poem with 10 lines

- ▶ **Contextual Prompts**

- ▶ Provide background information that shapes up AI response
 - ▶ Suggest few strategies of business growth based on current economic trends

- ▶ **Interactive Prompts**

- ▶ To generate various perspectives interactively, like a discussion mode
 - ▶ “What do you think of current election?”



Techniques for Optimizing Prompt Effectiveness

- ▶ **Be Specific**
 - ▶ More details in your prompts will provide more accurate results
- ▶ **Use Examples**
 - ▶ Provide examples for AI to generate response in specific format
- ▶ **Set Context**
 - ▶ Provide the exact context
- ▶ **Set Tone**
 - ▶ Set the tone or level of formality

Examples

General Prompt

Give me a balanced diet for a day

Sure! A balanced diet should include a variety of foods from all food groups to ensure you get the nutrients your body needs for energy, growth, and overall health. Here's an example of a balanced day's meals:

Breakfast:

- **Oatmeal** made with milk or a milk alternative (e.g., almond or oat milk) for added protein and calcium.
- **Toppings:** Fresh berries (antioxidants and fiber), a tablespoon of chia seeds (omega-3s), and a drizzle of honey or maple syrup (for sweetness).
- A **boiled egg** for a source of protein and healthy fats.
- A **glass of water** or a cup of herb

Mid-Morning Snack:

Setting context Prompt

give me a balanced diet for a 10-year-old boy with an issue with eye sight

For a 10-year-old boy with eyesight issues, a balanced diet should focus on promoting eye health while supporting overall growth and development. Nutrients that benefit eye health include **vitamin A, vitamin C, vitamin E, zinc, omega-3 fatty acids, and lutein**. These nutrients can be found in foods like leafy greens, carrots, fish, nuts, and berries. Here's a balanced meal plan that supports eye health while providing essential nutrients:

Breakfast:

- **Oatmeal** made with **fortified milk** or a milk alternative (like almond or soy milk). This provides **calcium** and **vitamin D** for bone and eye health.
- Add a tablespoon of **flaxseeds** or **chia seeds** for **omega-3 fatty acids** (important for

Clear and Specific Prompt

Give me a balanced diet for a day for a 6-year-old girl child

For a 6-year-old child, a balanced diet should provide plenty of nutrients for growth, energy, and development. A child's body requires a mix of protein, healthy fats, carbohydrates, vitamins, and minerals to support their active lifestyle and developing body. Here's an example of a balanced day of meals for a 6-year-old girl:

Breakfast:

- **Whole grain cereal** (unsweetened) with **milk** (or a milk alternative) for calcium and protein.
 - *Tip:* Choose cereals with at least 3g of fiber and low sugar content.
- **Half a banana** or fresh berries on the side for vitamins and energy.
- A glass of water or a small serving of **100% fruit juice** (preferably no added sugar).

Examples

Instructional Prompt

give me the response in bullet points with maximum 10 lines

Sure! Here's a concise version of the balanced diet for a 10-year-old boy with eyesight concerns

- **Breakfast:** Oatmeal with milk, flaxseeds, and sliced strawberries or blueberries (rich in omega-3s, vitamin C, and antioxidants). Boiled egg for vitamin A and zinc.
- **Mid-Morning Snack:** Carrot sticks with hummus and pumpkin seeds (beta-carotene, zinc, and healthy fats).
- **Lunch:** Grilled salmon or tuna (or chicken) with whole-grain bread and vegetables.
- **Afternoon Snack:** Greek yogurt with fruit and nuts.
- **Dinner:** Grilled chicken or tofu, sweet potatoes, and brown rice.
- **Evening Snack:** Orange slices or apple slices with nut butter.

Interactive Prompt

what do you think that causes issues in eye sight of a 10 year old boy? give me response in a paragraph of 5 sentences

Several factors can contribute to eyesight issues in a 10-year-old boy, including genetics, prolonged screen time, and poor nutrition. **Genetic factors** play a significant role, as children with parents who have vision problems are more likely to experience similar issues, such as nearsightedness (myopia). **Excessive screen time** can strain the eyes, leading to digital eye strain and worsening vision over time, particularly if the child doesn't take regular breaks. **A lack of proper nutrition**, especially deficiencies in vitamins like A, C, and E, omega-3 fatty acids, and zinc, can negatively impact eye health, leading to symptoms like dry eyes, blurred vision, or difficulty seeing in low light. **Bright lights, UV rays, or smoking** can also contribute to eye issues.

Give me the same response in different way- for Example, Genetic Factors- Explanation, Excessive Screen time- Explanation, etc

Setting Examples in Prompt

Here's a breakdown of potential causes of eyesight issues in a 10-year-old boy:

- **Genetic Factors:** If there's a family history of vision problems, such as myopia (nearsightedness) or astigmatism, a child is more likely to inherit these conditions. Genetics play a major role in determining a child's eye health.
- **Excessive Screen Time:** Spending long hours on devices like tablets, phones, or computers can cause digital eye strain. This leads to blurry vision, headaches, and difficulty focusing, especially if breaks are not taken regularly.
- **Poor Nutrition:** A diet lacking essential nutrients like **vitamin A**, **vitamin C**, **omega-3 fatty acids**, and **zinc** can impact eye health. These nutrients are vital for maintaining good vision and protecting the eyes from damage.
- **Environmental Factors:** Exposure to harmful elements like **UV rays**, **bright artificial lighting**,

Advanced Prompting techniques

➤ **Few-Shot Learning**

- Provide a few examples of desired outcome to help the model generalize
 - Show in ChatGPT how they will arrange output in lists, bullet points etc

➤ **Chain of thought Prompting**

- Encourage the model to explain its reasoning step by step
 - Ask question again from the response already given

➤ **Tree of Thoughts**

- Interact with model to share different perspective of the response



Evaluating AI responses

➤ **Metrics for Evaluation**

- **Relevance-** Is the response relevant to the prompt
- **Coherence-** Whether the response is logically structured and easy to follow
- **Accuracy-** Are the facts correct and aligned with the context

➤ **Iterative Testing**

- Test the same prompt with different versions and validate and compare the output
- Adjust the phrasing, context, or examples based on feedback to refine the model performance



Conclusion and Best Practices

- ▶ Prompt engineering is essential for maximizing AI Model performance
- ▶ Specificity, context, and clear instructions drive better results
- ▶ Experimentation and Iterations are key to optimize outputs
- ▶ Provide examples and contexts
- ▶ Continuous evaluation and refining prompts for more accurate results



Thank You