## Lab 4-01: Hands-on Prompt Engineering with Gemini APIs

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| **Introduction:**  Generative AI models, such as Google’s Gemini APIs available in Vertex AI, allow us to interact with powerful Large Language Models (LLMs) using simple prompts. Prompt engineering is the process of carefully designing these prompts to guide the model toward accurate and useful responses. In this lab, you will gain hands-on experience by building your first prompt engineering experiment with Gemini APIs in Google Cloud Platform (GCP). This lab is designed for beginners, so no prior knowledge of coding or cloud platforms is required.  **Problem Scenario:**  Imagine you are working as a junior AI developer for a startup. Your manager wants you to explore how prompt wording affects the quality of answers from Google’s Gemini model. The goal is to ask the model the same question in different ways and compare the outputs. For example, asking “Explain Cloud Computing in simple words” versus “Give me a one-line definition of Cloud Computing.” This will help your team understand how prompt design influences results, which is a key foundation for prompt engineering.  **Solution:**  **Step 1: Enable Required APIs**   1. Go to the Google Cloud Console: <https://console.cloud.google.com/>      1. Open the Navigation Menu (☰) > APIs & Services > Library.      1. Enable Vertex AI API.     **Step 2: Open Vertex AI Studio**   1. In the Google Cloud Console, search for Vertex AI Studio in the search bar.      1. Open it; you will see an interface for experimenting with Gemini APIs.      1. Click Create prompt.     **Step 3: Your First Prompt**   1. In the text box, type this prompt:   **Explain cloud computing in simple terms.**     1. Click Submit.      1. Observe the model’s response.     **Step 4: Refine the Prompt**  Now try changing the wording:   * Prompt 1:   **Explain cloud computing as if I were 10 years old.**     * Prompt 2:   **Give me a one-line professional definition of cloud computing.**     * Prompt 3:   **List 3 advantages of cloud computing in bullet points.**    Compare the responses. Notice how prompt wording changes the output format and detail.  **Step 5: Try Few-Shot Prompting**  Few-shot prompting means giving examples to guide the model.   1. Type this prompt:   **Here are two examples of how to explain technology concepts:**  **Q: What is the Internet?**  **A: The Internet is a global network that connects computers and lets them share information.**  **Q: What is Artificial Intelligence?**  **A: Artificial Intelligence is when computers are designed to think and learn like humans.**  **Now your turn:**  **Q: What is Cloud Computing?**     1. Submit it; you will see a more structured and clearer answer. |