## Lab 1-01: Exploring AI Foundations with Google Cloud tools

|  |
| --- |
| **Introduction:**  Generative AI is transforming industries by enabling rapid development of intelligent applications that can understand and generate human-like content. Google Cloud’s Vertex AI Studio simplifies this process by offering a powerful, user-friendly interface for experimenting with foundation models like Gemini. With Vertex AI Studio, developers and business users can quickly prototype, test, and deploy AI-driven solutions without deep expertise in machine learning or infrastructure management. This lab, “Exploring AI Foundations with Google Cloud Tools,” is designed to give hands-on experience with these capabilities and help users understand how to customize prompts, explore multimodal features, and deploy serverless AI applications using Google Cloud’s powerful ecosystem.  **Problem Scenario:**  Imagine you are working as a solution architect at an insurance technology firm. Your team has been asked to design a prototype for an AI-powered assistant that helps underwriters assess client risk based on facility descriptions and request summaries. Manual review of client notes is time-consuming and inconsistent. To speed up the process, your goal is to build an AI model that reads textual input and optionally analyzes images of facilities, highlights risk factors like flood zones or infrastructure issues, and provides a professional summary. Using Vertex AI Studio, you will create this assistant, configure its behavior, and deploy it as a web application for real-time use by insurance agents.  **Solution:**  ***Prerequisites***  Ensure you have the following before beginning:   * A billing-enabled Google Cloud Project * Vertex AI API is enabled in your project * Sufficient permissions (e.g., Owner or Editor role) * If needed: Enable Cloud Run and IAM permissions to deploy the web app later   **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 these APIs:    * Vertex AI API      * + Cloud Run API      * + Artifact Registry API (for deploying web apps)     **Step 2: Open Vertex AI Studio**   1. In the Navigation Menu, go to: Vertex AI > Vertex AI Studio.      1. Click the Browse prompt gallery.      1. You will land on the Prompt Gallery.     **Step 3: Create a New Prompt**   1. Click “Create prompt”.      1. You will see:    * System Instructions (top box)    * Prompt Input (bottom text area)    * Model & Settings panel (right sidebar)     **Step 4: Configure Your Prompt – Insurance Assistant Use Case**   1. Rename your prompt: **Insurance Risk Assistant – Prototype**      1. In System Instructions, enter:   **You are an AI assistant for insurance underwriting. Your job is to read client notes, identify risk factors, and summarize potential issues in a professional tone. Use only the information provided.**     1. In Prompt Input, paste:   **Client: SafeHarbor Warehousing**  **Facility: 50,000 sq ft, located in a coastal area**  **Issues: Reports of water leakage, outdated electrical systems**  **Request: Seeking full coverage for cargo storage**     1. In the Model & Settings panel:    * Model: Select Gemini 1.5 Pro or Text Bison      * + Max Tokens: Set to 1024      * + Temperature: Set to 0.4 (less randomness)     **Step 5: Run the Prompt**   1. Click Submit at the bottom and review the response:    * Did it identify risks like leakage and outdated wiring?    * Was the tone professional?    * Did it avoid adding false or hallucinated details?     **Step 6 (Optional): Try Multimodal Prompting**  **Note**: Multimodal prompting works only if Gemini Pro Vision is available in your region/project.   1. Click “+” in Prompt Input to add an image.      1. Upload a photo (e.g., of the facility).      1. Adjust your prompt:   **Review this image and the notes below. Identify risk factors.**  **Client: SafeHarbor Warehousing**  **Facility: 50,000 sq ft, located in a coastal area**  **Issues: Reports of water leakage, outdated electrical systems**  **Request: Seeking full coverage for cargo storage**     1. Submit and observe the output.     **Step 7: Test with New Data**  Try a different input like:  **Client: NorthPeak Distributors**  **Facility: 70,000 sq ft, earthquake zone, installed new fire suppression**  **Request: Liability and inventory coverage**  Check whether the model identifies both:   * Risks (earthquake zone) * Mitigations (fire suppression) |