

# Day43\_Project\_Multi\_model\_Text\_Image\_Generation\_&\_Streamlit

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## Project: Multimodel\_Text\_Image\_Generation\_Using\_Gemini\_Streamlit

This project demonstrates how to build a multimodal AI application that accepts both text and image input, and generates intelligent responses using Google's Generative AI (Gemini 2.5 Flash model), all wrapped in a Streamlit UI.

### What You'll Learn

- How to set up and use the google-generativeai Python SDK
- How to integrate Gemini for both text and image understanding
- How to use Streamlit to create an interactive user interface

### Technologies Used

- Python
- Google Generative AI (google-generativeai)
- Gemini 2.5 Flash model
- Streamlit
- PIL (Python Imaging Library)

### Note:

This document is written in notebook format for explanation purposes. To run this as an actual app:

- Copy the code into a .py file (e.g., `app.py`) using VS Code or Notepad
- Open terminal in the same folder
- Run the app using: `streamlit run app.py`

## 1 Install Required Libraries

What these libraries do:

- streamlit: to create a web app with buttons, file upload, etc.
- google-generativeai: to connect with Gemini
- pillow: to work with images in Python (also called PIL)

```
[1]: # pip install streamlit google-generativeai pillow
```

## 2 Import Python Libraries

Start your .py or .ipynb file with:

```
[2]: import streamlit as st  # For building the web app
import google.generativeai as genai  # To use Gemini AI
from PIL import Image  # To load images
```

## 3 Add Your Gemini API Key

You can get your API key from <https://makersuite.google.com/app/apikey>

Never share this key with anyone online!

```
[3]: genai.configure(api_key="YOUR_API_KEY")  # Replace with your real key
```

## 4 Load the Gemini Model

Gemini has multiple versions. We'll use the one that understands both images and text:

```
[4]: model = genai.GenerativeModel("gemini-2.5-flash-preview-05-20")
```

## 5 Create the Streamlit Web Interface

This part shows the title, input boxes, and upload option.

```
[5]: st.set_page_config(page_title="Gemini AI - Text or Image")
st.title("Gemini AI - Ask a Question or Upload an Image")
st.write("You can either ask a question or upload an image. Gemini will respond_
accordingly.")
```

```
2025-07-12 16:52:53.243 WARNING
streamlit.runtime.scriptrunner_utils.script_run_context: Thread 'MainThread':
missing ScriptRunContext! This warning can be ignored when running in bare mode.
2025-07-12 16:52:53.248 WARNING
streamlit.runtime.scriptrunner_utils.script_run_context: Thread 'MainThread':
missing ScriptRunContext! This warning can be ignored when running in bare mode.
2025-07-12 16:52:56.435
```

**Warning:** to view this Streamlit app on a browser, run it with the following command:

```
streamlit run C:\Users\Lenovo\AppData\Roaming\Python\Python313\site-
packages\ipykernel_launcher.py [ARGUMENTS]
2025-07-12 16:52:56.440 Thread 'MainThread': missing ScriptRunContext! This
warning can be ignored when running in bare mode.
2025-07-12 16:52:56.446 Thread 'MainThread': missing ScriptRunContext! This
warning can be ignored when running in bare mode.
```

2025-07-12 16:52:56.453 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

## 6 Set up Page

```
[6]: if "text_answer" not in st.session_state:
      st.session_state.text_answer = ""
      if "image_answer" not in st.session_state:
          st.session_state.image_answer = ""
      if "uploaded_image" not in st.session_state:
          st.session_state.uploaded_image = None
```

2025-07-12 16:53:00.972 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-07-12 16:53:00.975 Session state does not function when running a script without `streamlit run`

2025-07-12 16:53:00.979 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-07-12 16:53:00.983 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-07-12 16:53:00.988 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-07-12 16:53:00.992 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-07-12 16:53:00.996 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-07-12 16:53:01.000 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-07-12 16:53:01.003 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-07-12 16:53:01.007 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

## 7 Inputs

```
[7]: prompt = st.text_area("Ask a question (optional):", placeholder="Example: What_
      ↪is Artificial Intelligence?")
      image_file = st.file_uploader("Upload an image (optional):", type=["jpg",
      ↪"jpeg", "png"])
```

2025-07-12 16:53:03.822 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-07-12 16:53:03.826 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-07-12 16:53:03.832 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-07-12 16:53:03.836 Thread 'MainThread': missing ScriptRunContext! This

warning can be ignored when running in bare mode.  
2025-07-12 16:53:03.840 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.  
2025-07-12 16:53:03.845 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.  
2025-07-12 16:53:03.849 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.  
2025-07-12 16:53:03.853 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.  
2025-07-12 16:53:03.857 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.  
2025-07-12 16:53:03.861 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.  
2025-07-12 16:53:03.865 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

## 8 Clear Button

```
[8]: if st.button("Clear Output"):
      st.session_state.text_answer = ""
      st.session_state.image_answer = ""
      st.session_state.uploaded_image = None
      st.rerun()
```

2025-07-12 16:53:06.728 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.  
2025-07-12 16:53:06.733 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.  
2025-07-12 16:53:06.736 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.  
2025-07-12 16:53:06.740 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.  
2025-07-12 16:53:06.744 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

## 9 Action Buttons

```
[9]: col1, col2 = st.columns(2)
```

2025-07-12 16:53:08.949 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.  
2025-07-12 16:53:08.952 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.  
2025-07-12 16:53:08.956 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

## 10 Generate text response

```
[10]: with col1:
    if st.button("Generate Answer from Question"):
        if not prompt.strip():
            st.warning("Please enter a question.")
        else:
            with st.spinner("Generating answer..."):
                try:
                    response = model.generate_content(prompt.strip())
                    st.session_state.text_answer = response.text
                except Exception as e:
                    st.error(f"Error: {e}")
```

2025-07-12 16:53:11.168 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-07-12 16:53:11.172 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-07-12 16:53:11.175 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-07-12 16:53:11.180 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-07-12 16:53:11.184 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

## 11 Generate image description

```
[11]: with col2:
    if st.button("Describe Uploaded Image"):
        if not image_file:
            st.warning("Please upload an image.")
        else:
            try:
                image = Image.open(image_file)
                st.session_state.uploaded_image = image
                with st.spinner("Describing image..."):
                    response = model.generate_content([image])
                    st.session_state.image_answer = response.text
            except Exception as e:
                st.error(f"Error: {e}")
```

2025-07-12 16:53:16.584 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-07-12 16:53:16.589 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-07-12 16:53:16.594 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-07-12 16:53:16.599 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-07-12 16:53:16.603 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

## 12 Show Outputs if present

```
[12]: if st.session_state.text_answer:
        st.subheader("AI Answer:")
        st.markdown(st.session_state.text_answer)

    if st.session_state.image_answer:
        st.subheader("Image Description:")
        if st.session_state.uploaded_image:
            st.image(st.session_state.uploaded_image, caption="Uploaded Image",
                    use_column_width=True)
        st.markdown(st.session_state.image_answer)
```

2025-07-12 16:53:19.140 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-07-12 16:53:19.145 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

## 13 Instructions (only show if no answers)

```
[13]: if not st.session_state.text_answer and not st.session_state.image_answer:
        st.markdown("""---
Instructions:
- Use "Generate Answer from Question" if you only want to ask a question.
- Use "Describe Uploaded Image" if you only want to upload and describe an
image.
- Both inputs are optional and processed separately.
- Click "Clear Output" to reset the app.

To run this app:
1. Save the code in a file named app.py
2. Open terminal and run: streamlit run app.py
""")
```

2025-07-12 16:53:20.671 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-07-12 16:53:20.675 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-07-12 16:53:20.680 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-07-12 16:53:20.684 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

## 14 Final Notes for You

### 14.1 How to Run This Project

- Save everything in a Python file: app.py
- Open your terminal or Anaconda prompt
- Run this command:

```
streamlit run app.py
```

## 15 Conclusion

- Built a Gemini AI app that accepts text and image inputs.
- Used Streamlit to make it interactive and easy to use.
- Learned how to call Google Generative AI models in real-world apps.