Brief Explanation of Approach and Design Decisions

1. Approach

The goal of the project was to build a simple, user-friendly document summarization service using a Large Language Model (LLM). The approach involved:

1. **Frontend Input Handling:**
   - Users can input text via a **textarea** or upload a **.txt file**.
   - File uploads are read using JavaScript `FileReader` and populated into the textarea for processing.
2. **Backend Processing:**
   - A **Flask** server receives the text input and the chosen summary style.
   - Text is sent to a **Hugging Face LLM API** (`facebook/bart-large-cnn`) for summarization.
   - Parameters such as `max_length` and `min_length` are adjusted based on the chosen style (brief, detailed, bullet points).
3. **Error Handling and Validation:**
   - Input validation ensures empty text is not sent to the API.
   - API responses are checked, and exceptions are handled gracefully, providing clear feedback to the user.
4. **Frontend Output Display:**
   - Summary results are displayed in a styled **output box**.
   - A **loader animation** indicates progress during API calls.

2. Design Decisions

1. **Modular Backend:**

    - The `summarize_text()` function isolates the API logic, making it easy to switch LLM providers or add new summarization styles in the future.

2. **Multiple Summarization Styles:**

    - Users can select **brief**, **detailed**, or **bullet points**.

    - This is implemented by adjusting model parameters and prepending instructions for bullet style.

3. **Simple and Clean UI:**

    - The web interface is minimalistic and intuitive, ensuring a smooth user experience without unnecessary clutter.

4. **Scalability and Extensibility:**

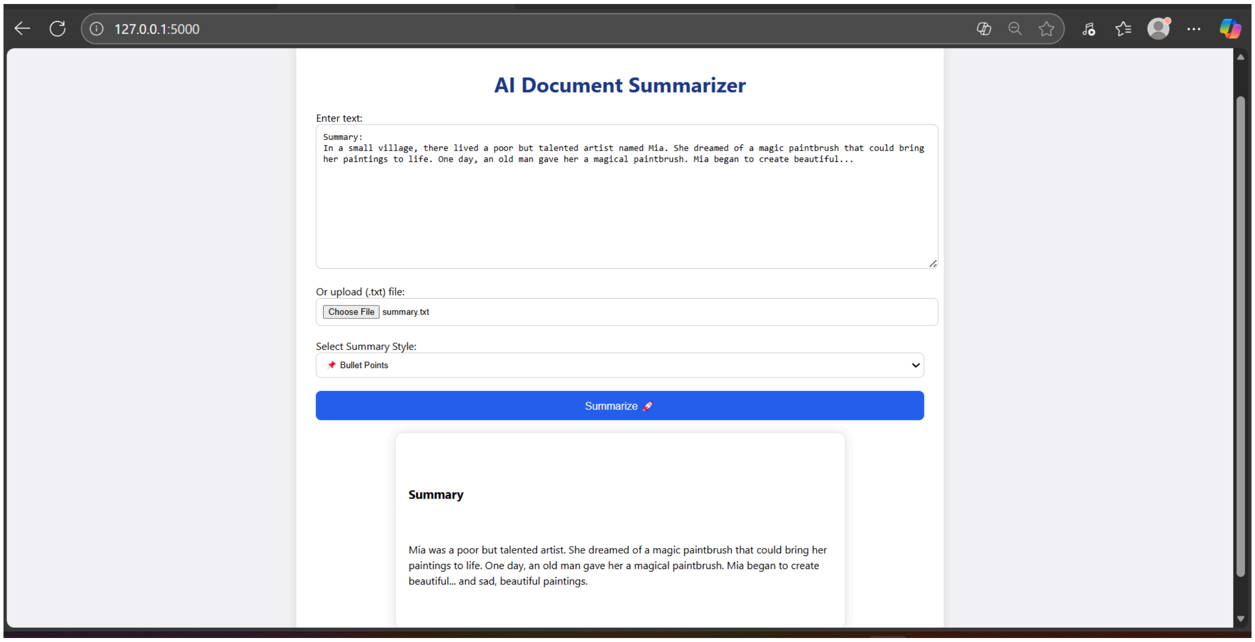
    - Code structure allows easy extension to multiple LLMs, batch processing, or additional input/output formats.

5. **Error Handling and UX:**

    - Loader and error messages provide feedback to users in case of long processing times or API failures.

6. **Future-Proofing:**

    - Designed to allow future improvements like multi-language support, export options, and real-time streaming summaries.



AI Document Summarizer

Enter text:

```
Summary:
In a small village, there lived a poor but talented artist named Mia. She dreamed of a magic paintbrush that could bring
her paintings to life. One day, an old man gave her a magical paintbrush. Mia began to create beautiful...
```

Or upload (.txt) file:

summary.txt

Select Summary Style:

📌 Bullet Points

Summary

Mia was a poor but talented artist. She dreamed of a magic paintbrush that could bring her paintings to life. One day, an old man gave her a magical paintbrush. Mia began to create beautiful... and sad, beautiful paintings.