

Note 3 — Build Your Mini-App Front-End: “StudyHub AI”

1) What you’ll learn

- Front-end basics: **HTML (structure), CSS (style), JS (behavior)**.
- How web pages talk to AI using **APIs** and **JSON**.
- Academic ideas: **latency, rate limits, tokens/context window, embeddings, vector search, privacy, accessibility**.

2) Meet your user: Aisha (Age 14)

Aisha gets overwhelmed by chapters and projects. Your app should reduce stress by offering: - **AI Notetaker**: Cleans messy notes → neat bullets. - **AI Summarizer**: Turns long paragraphs → short, clear points. - **AI Work Planner**: Converts a big goal → stepwise plan with time estimates.

3) The LEGO model

- **HTML = bricks** (titles, text boxes, buttons, sections).
- **CSS = paint & shapes** (dark theme, spacing, rounded corners).
- **JavaScript = action** (when a button is clicked, do something).

4) What is an API? (pizza delivery analogy)

- Your page is the **menu**.
- The AI brain (server) is the **kitchen**.
- The API is the **delivery person** carrying your request (JSON) and returning the response (JSON).
- **Latency**: The waiting time for the pizza (response).
- **Rate limit**: How many pizzas (requests) you can order per minute.
- **Tokens/context window**: The size of the chef’s working table—how much text the AI can read/process in one go.

5) Design blueprint (paper prototype first)

Header: “StudyHub AI — Your Smart Study Companion.”

Grid (responsive): 1) **AI Notetaker**

- Textarea: “Paste messy notes...”
- Button: “Organize Notes”
- Output: Bullets grouped by headings.

2) **AI Summarizer**

- Textarea: “Paste a long paragraph...”
- Button: “Summarize Text”
- Output: 3–5 bullets + one-line takeaway.

3) **AI Work Planner**

- Input: “My big goal...”
- Button: “Plan My Project”
- Output: Steps with time estimates.

UX writing: - Clear verbs (“Summarize,” “Organize,” “Plan”). - Helpful empty states (“Your summary will appear here”). - Friendly errors (“Looks empty—paste some text first!”).

6) Academic ideas for curious builders

- **JSON:** A simple text format for data: { "text": "Hello" }.
- **Embeddings:** Turn text into number lists so computers can measure similarity (used in search and clustering). Helpful for “find related notes.”
- **Vector search:** Store embeddings; quickly find nearest matches (e.g., similar topics across your notes).
- **Prompt engineering:** Give the AI a role, constraints, and examples to get better results (like the CLEAR method for video).
- **Caching:** Save recent results so repeated requests are instant.
- **Privacy/PII:** Never send personal details (full names, phone numbers) to services without permission. Mask sensitive info.
- **Accessibility:** High-contrast colors, readable font sizes (16–18px), labels for inputs, keyboard navigation.

7) Interactive Activity (12–15 minutes)

- 1) Sketch the page on paper (header + 3 cards).
- 2) Label inputs, buttons, and outputs.
- 3) Write the helper texts and error messages.
- 4) Draft **example requests** and **expected responses** (small JSON-like blocks in your notebook).
- 5) Share your sketch in breakout rooms and suggest one improvement to a peer’s design.

8) Testing like a scientist

- **Task success:** Can Aisha turn messy notes into neat bullets in under 1 minute?
- **Readability:** Are fonts and spacing comfortable?
- **Latency:** Does the app respond quickly enough (under a few seconds)? If not, show a friendly “Working...”
- **Robustness:** What happens if the input is empty or too long? Handle errors calmly.
- **Fairness:** Test with content from different subjects and languages (English + one Indian language) to ensure it works for many students.

9) Mini-project (20–30 minutes)

Create a **one-page design spec**: - Final sketch with layout labels. - Exact button texts and helper lines. - Three sample inputs + expected outputs (bullets, summary, plan). - A short paragraph: “How my app reduces study stress.”

Stretch ideas (for later): - **AI Flashcards:** Convert summaries into Q&A pairs. - **Streak counter:** Motivate daily practice. - **Language toggle:** English + Hindi/Tamil. - **Download:** Export notes to PDF for revision.

10) Reflection

- One front-end concept I understood better today (API/JSON/embeddings): _____

- A UX change that will help Aisha most: _____
- A new feature I want to try next week: _____