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AI for Bharat Hackathon

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Team Name : EVOLVE AI

Team Leader Name : Rachit Goyal

Problem Statement : AI for Learning & Developer Productivity

Brief about the Idea:

STEM learning today is largely static and passive, where students consume fixed content without actively exploring concepts or understanding how topics connect in real time.

Our Solution:

An AI-powered interactive learning system that transforms traditional study material into a dynamic and adaptive learning experience.

- Students generate **concept-specific explanations and visual learning content on demand**, instead of relying on pre-recorded lectures.
- AI automatically creates **structured concept maps and learning paths**, helping students understand topic dependencies and learning order.
- Learning is reinforced through **interactive practice, quizzes, and activity-based learning**, encouraging active understanding instead of passive revision.
- Integrated **exam planning and performance analysis** help identify weak areas and generate personalized study workflows.

- How different is it from any of the other existing ideas?

Platform	Their Approach	EVOLVE AI
NotebookLM	Information retrieval	**Concept understanding + visual explanation + learning flow**
Coursera	Pre-recorded video libraries	**On-demand AI explanations and adaptive learning paths**
ChatGPT/Claude	Text-based answers	**Visual learning, concept mapping, and interactive reinforcement**
Manim (3Blue1Brown)	Manual creation (hours)	**Instant AI-generated explanations and learning content**

- How will it be able to solve the problem?
  - **Can’t Visualize Concepts:** AI generates dynamic explanations and visual learning content to help students see concepts instead of imagining them.
  - **No Structured Learning Path:** Concept extraction builds visual roadmaps showing dependencies and learning order.
  - **Passive Learning & Revision:** Interactive activities, quizzes, and feedback loops reinforce concepts through active learning.
  - **Inefficient Exam Preparation:** Performance tracking identifies weak areas and generates personalized study and revision plans.
- USP of the proposed solution
  - **On-Demand AI Learning —** Explanations, visuals, and practice generated instantly for any topic
  - **Intelligent Concept Roadmaps —** Structured learning paths based on concept relationships
  - **Interactive Reinforcement —** Learning through activities, correction, and feedback
  - **Adaptive Exam Intelligence —** Weak-topic detection and personalized study workflows
  - **Unified Learning Loop —** Understanding → Planning → Practice → Improvement

List of features offered by the solution

Understand → Structure → Practice → Master

ASK

- **Multi-input suppor**t (text, image, documents)
- On-demand generation of quizzes, flashcards & **AI-generated Videos**
- **Context-aware responses** from uploaded study material
- **Homework Mode:** guided hints, time & submission tracking

PLAN

- **Smart learning roadmaps** tailored to student level.
- **Visual concept dependency mapping.**
- Identifies prerequisites and **next learning steps.**
- **Adaptive learning paths** based on goals and progress.

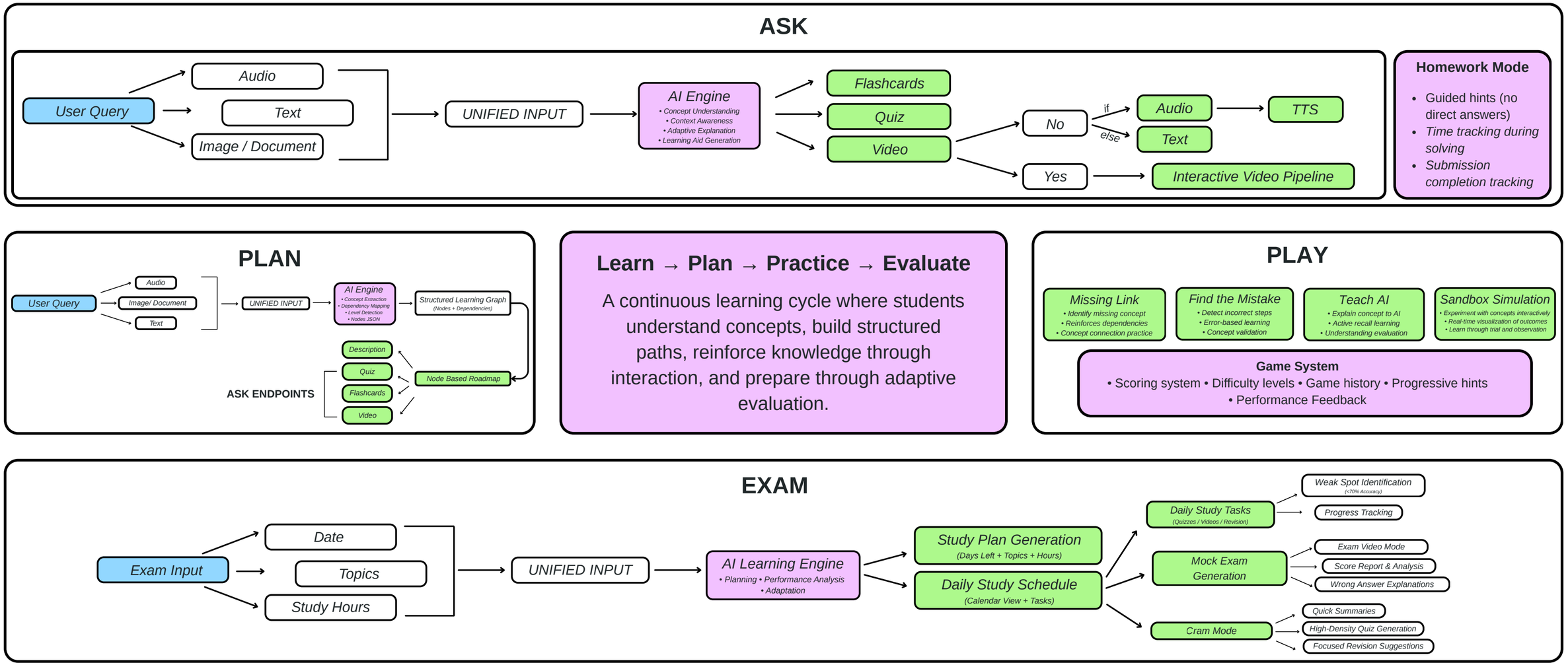
PLAY

- **Gamified interactive challenges** for active learning.
- **Immediate feedback** and concept correction.
- AI **identifies knowledge gaps** through performance.
- **Progress tracking** and **mastery-based learning.**

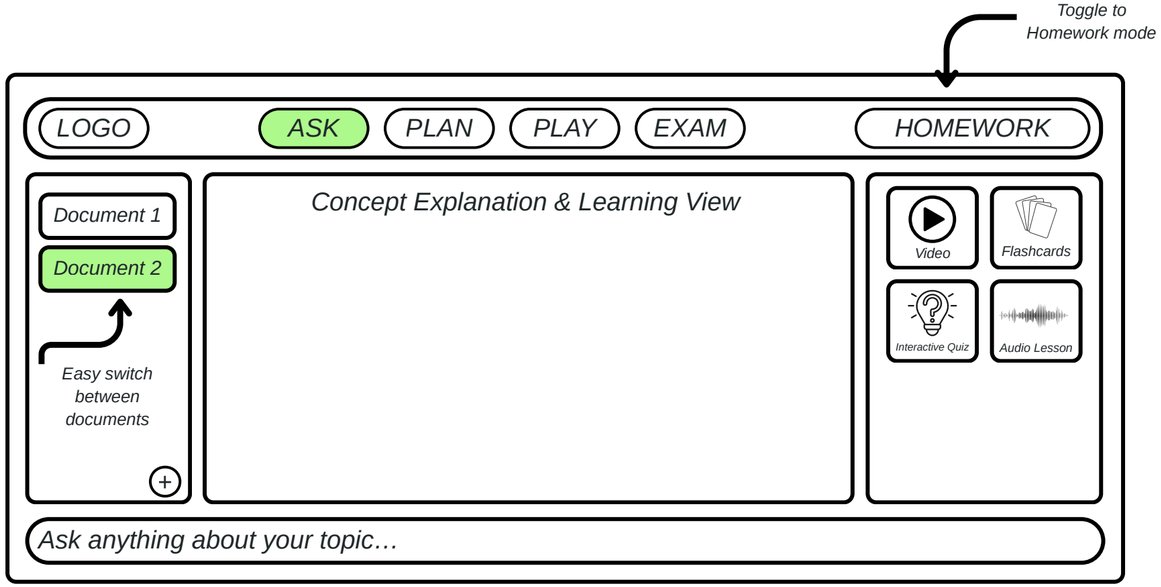
EXAM

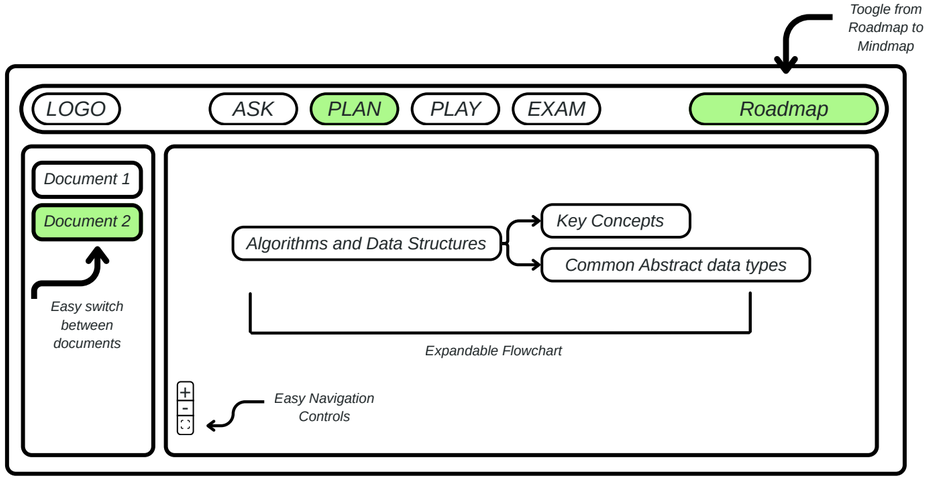
- AI-generated **study plans** based on exam dates and topics.
- **Weak-topic identification** using performance analysis.
- **Mock exams** and **revision-focused quizzes**.
- **Personalized revision** and cram-mode preparation.

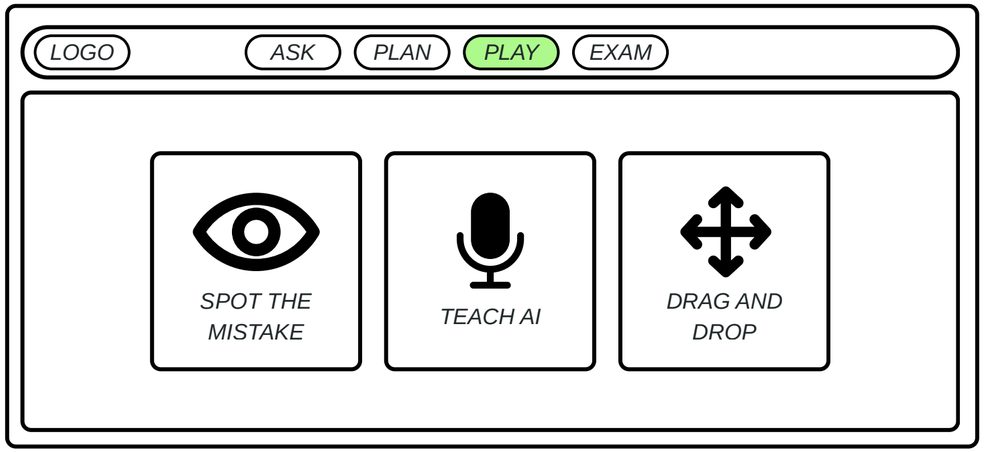
Process flow diagram or Use-case diagram

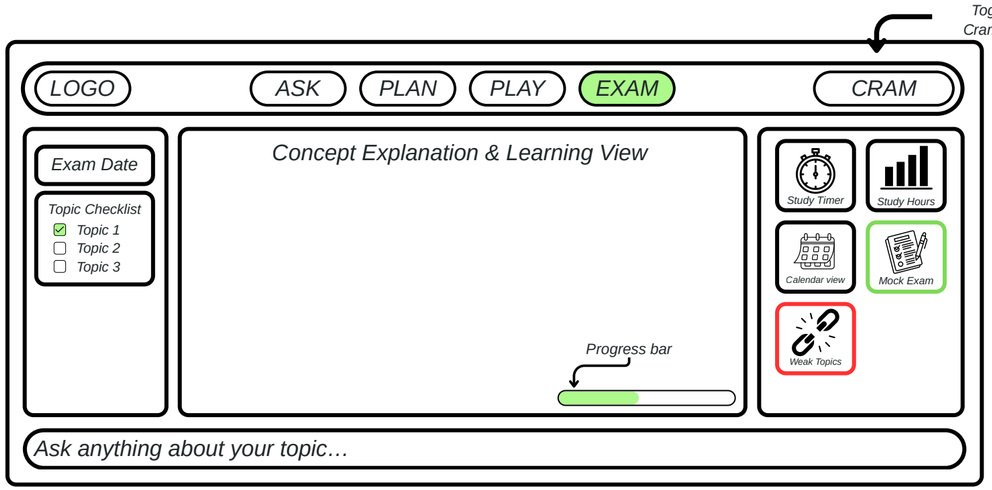


Wireframes/Mock diagrams of the proposed solution

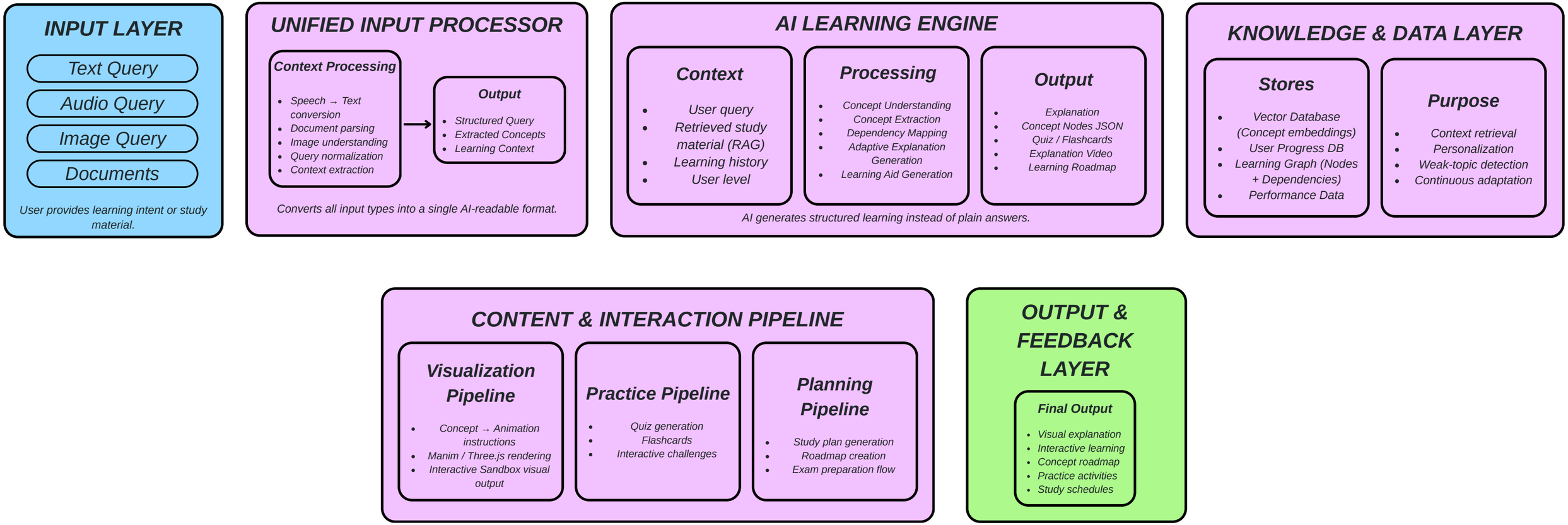








Architecture diagram of the proposed solution:



Technologies to be used in the solution:

Frontend

- React
- React Markdown
- React Flow (Learning Graph & Roadmaps)
- tldraw (Interactive Canvas)
- Three.js (Interactive Visuals)

Backend

- FastAPI
- Neon Postgres (User Data & Progress)
- Chroma Vector DB (RAG / Context Retrieval)
- Async Workers (Video & AI pipelines)

Animations & Video

- Manim (Concept Animations)
- Remotion
- Three.js
- LaTeX (Math & Equation)
- Sandbox Environment

AI & Intelligence Layer

- LangChain
- GPT-4.1 mini / Gemini
- Groq
- SadTalker
- Speech-to-Text & Text-to-Speech APIs

Estimated implementation cost:

$ 0.008
Token Cost

$ 0.02
per Video cost

3k–5k
tokens per Video

$1.6 per 1M tokens
Estimated blended cost across LLM calls

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Thank You