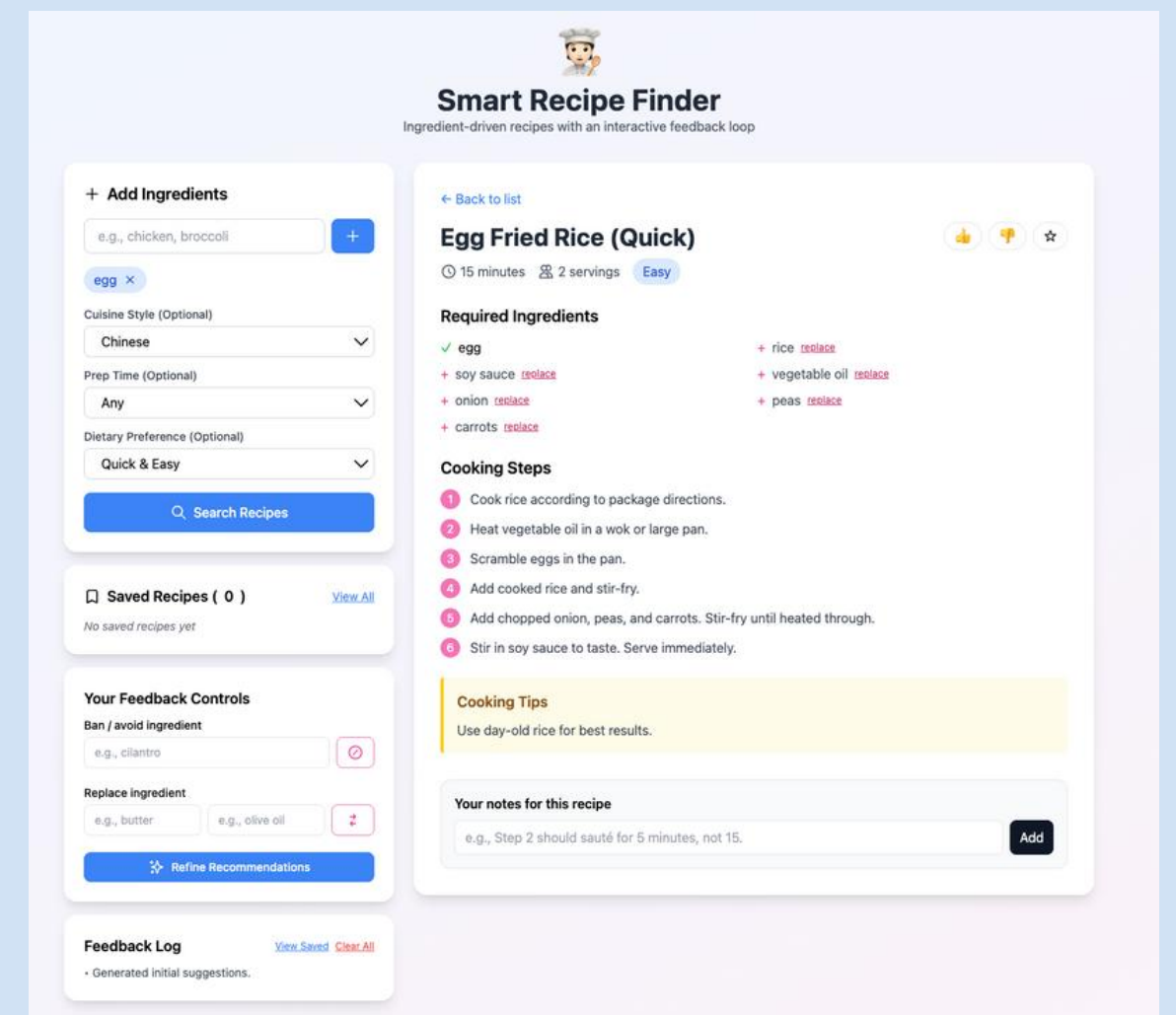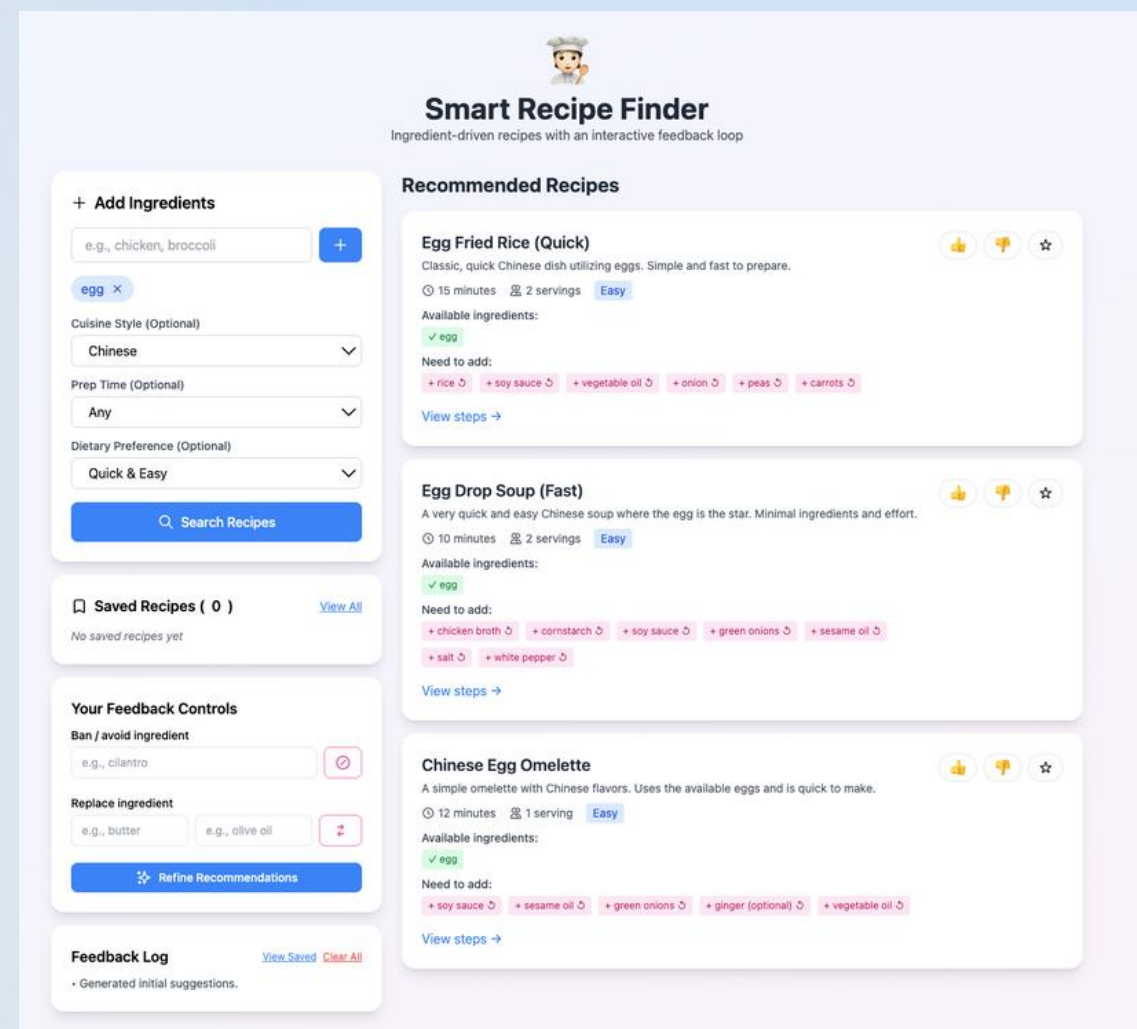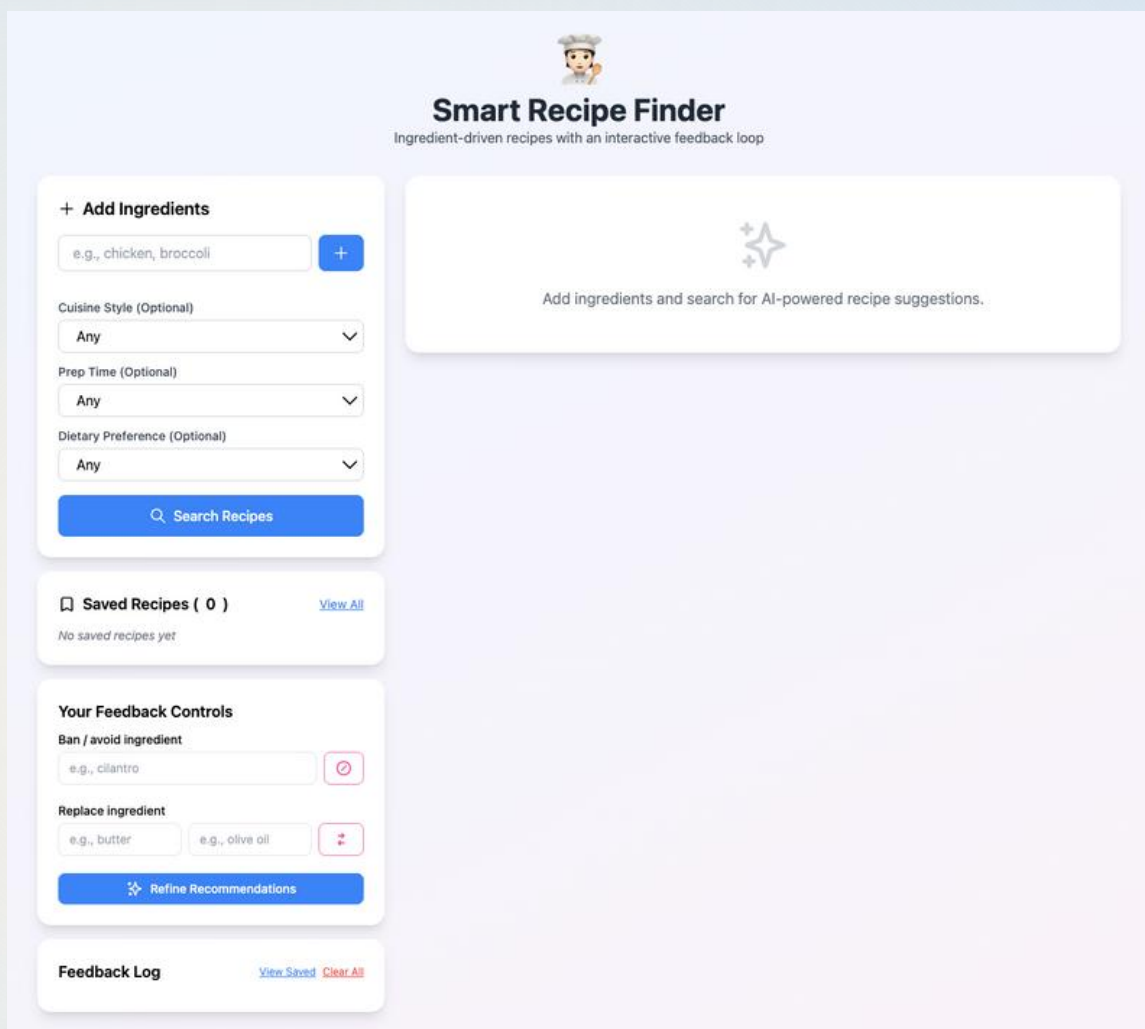05318 Final Project

SMART RECIPE FINDER

AI-Powered Recipe Recommendation with Interactive Feedback Loop

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WHAT I BUILT

- Interactive recipe finder using Gemini AI API
- Features: ingredient-based search, multiple filters, feedback loop, recipe bookmarking...
- Input: ingredients + simple preferences
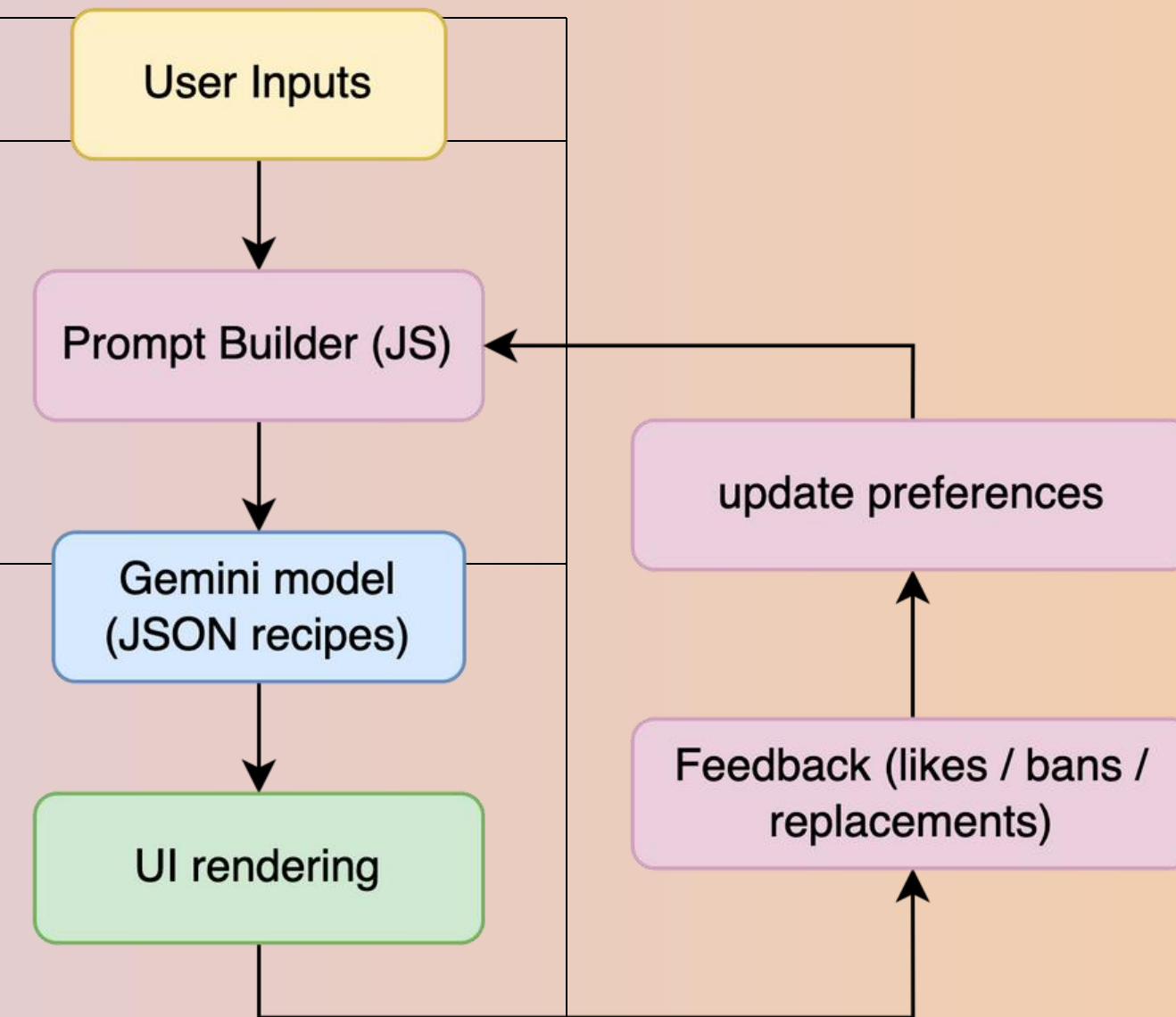- Output: AI-generated recipes

WHY THIS APPLICATION

People often have ingredients but don't know what to cook.

Generic recipe apps don't learn from individual preferences.

AI system that adapts to user's taste, dietary needs, and constraints.

IMPLEMENTATION

- Model: Gemini 2.0 Flash (Google's LLM)

- Why Gemini:
  - Real-time recipe generation (no pre-trained dataset needed)
  - Structured JSON output for consistent format
  - Context-aware: incorporates user feedback dynamically

- Architecture:
  - Frontend: HTML + Tailwind CSS + vanilla JS
  - API Integration: Gemini API with custom prompt engineering
  - Storage: localStorage for user preferences persistence
- No fixed dataset: the model is the recipe generator

User Inputs

Prompt Builder (JS)

update preferences

Gemini model
(JSON recipes)

Feedback (likes / bans /
replacements)

UI rendering

CONCEPTS FROM LECTURES

Designing for Failures and AI Alignment

Human-in-the-loop & granular feedback

[like & dislike] 👍 👎

[notes/correction]

Your notes for this recipe

e.g., Step 2 should sauté for 5 minutes, not 15. | Add

Transparency & Interpretability

Showing matched ingredients & explicit "reason" for each recipe

Egg Fried Rice (Quick)

Classic, quick Chinese dish utilizing eggs. Simple and fast to prepare.

🕐 15 minutes 👥 2 servings Easy

Available ingredients:

✓ egg

Need to add:

+ rice ↻ + soy sauce ↻ + vegetable oil ↻ + onion ↻ + peas ↻ + carrots ↻

Human-Centered AI Design

Remember interactions & learn from user behavior (stored preferences)

[ban & replace]

+ soy sauce ↻

Your Feedback Controls

Ban / avoid ingredient

e.g., cilantro | 🚫

Replace ingredient

e.g., butter | e.g., olive oil | ⇄

✨ Refine Recommendations

PILOT USER STUDY & INSIGHTS

- 7 target users
- Task:
  - Explore the web app
  - Use one recommended recipe to cook a real dish
  - Short interview for feedback
- Insights: What we learned from observing real users that meaningfully informs design decisions.
  - Customization Flexibility Matters
  - Transparency Builds Trust
  - Respect User Preferences
  - Actionable Results Are Essential
  - Sustained Engagement Drives Value
  - …

: "Need prep time filter for busy schedules"
Added prep time filter (15min / 30min / 60min / 60+min)

"Want to customize dietary preferences beyond preset options"
Added "Custom/Other" option with free text input

"Need a way to save recipes for later"
Implemented bookmarking with saved recipes view

"Recipes were accurate and practical; time estimates matched reality"

"Loved the ingredient ban and replacement feature, finally no cilantro!"

"Beautiful UI! This AI recipe finder learns my preferences, saving so much time compared to manual recipe searching!"

THANKS