MICHIGAN STATE UNIVERSITY

Project Plan Presentation

Prompt Assistant: Mastering the Art of Prompt Engineering

The Capstone Experience

Team HAP

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From Students…
…to Professionals

Project Sponsor Overview

- Founded in Detroit, Michigan in 1960
- Full-service health insurance company
- Serves over 430,000 members across Michigan

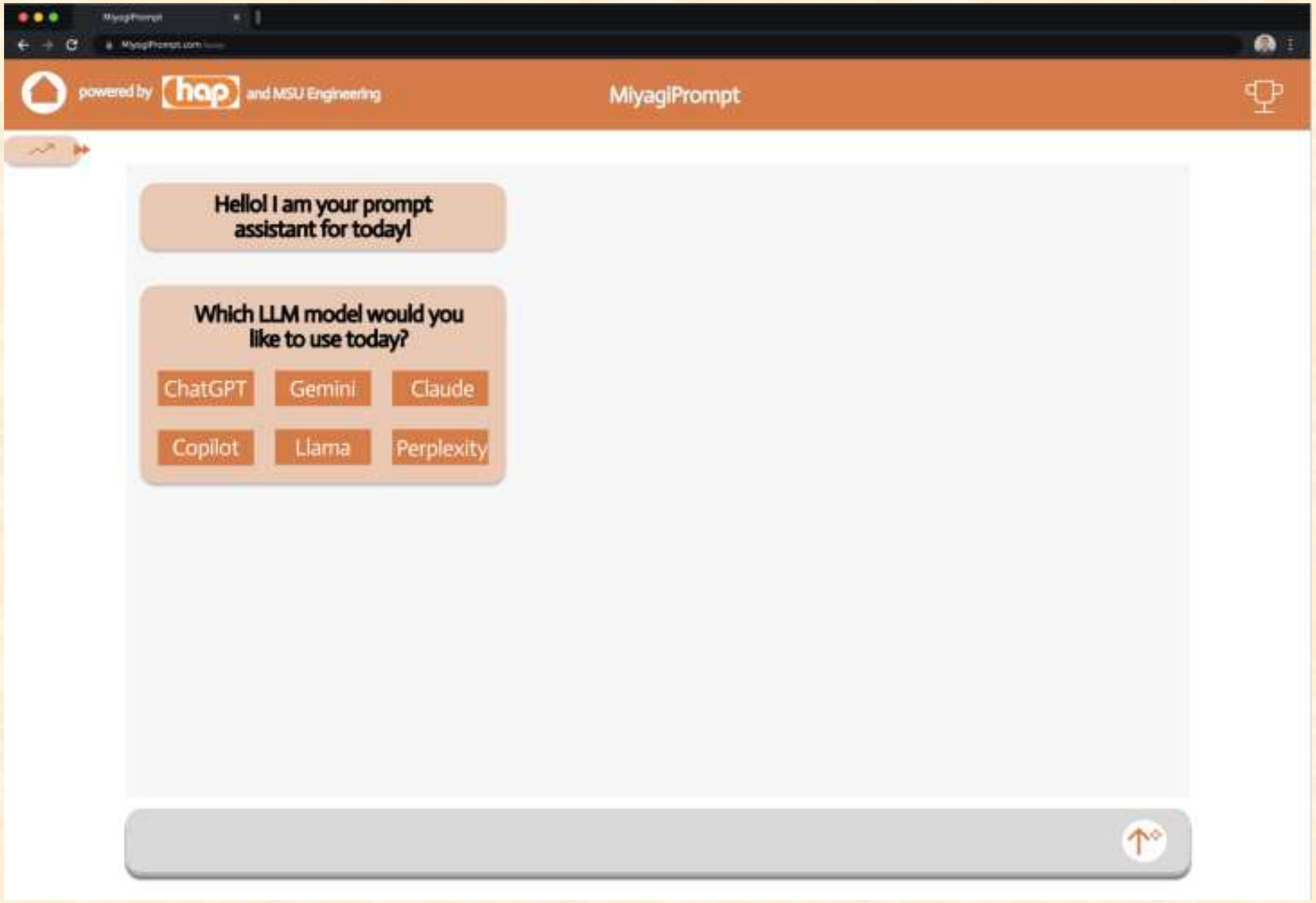
Project Functional Specifications

- Solves the problem of vague, ineffective AI prompts
- Guides users to build and test strong prompts through a web application
- Boosts output quality, productivity, and engagement through gamification

Project Design Specifications

- Home Page: Select a model and build prompts step-by-step
- Prompt Scoring Tab: Track prompt quality with live evaluation
- Badges Dropdown: Unlock badges for hitting scoring milestones
- LLM Arena: Compares LLM responses

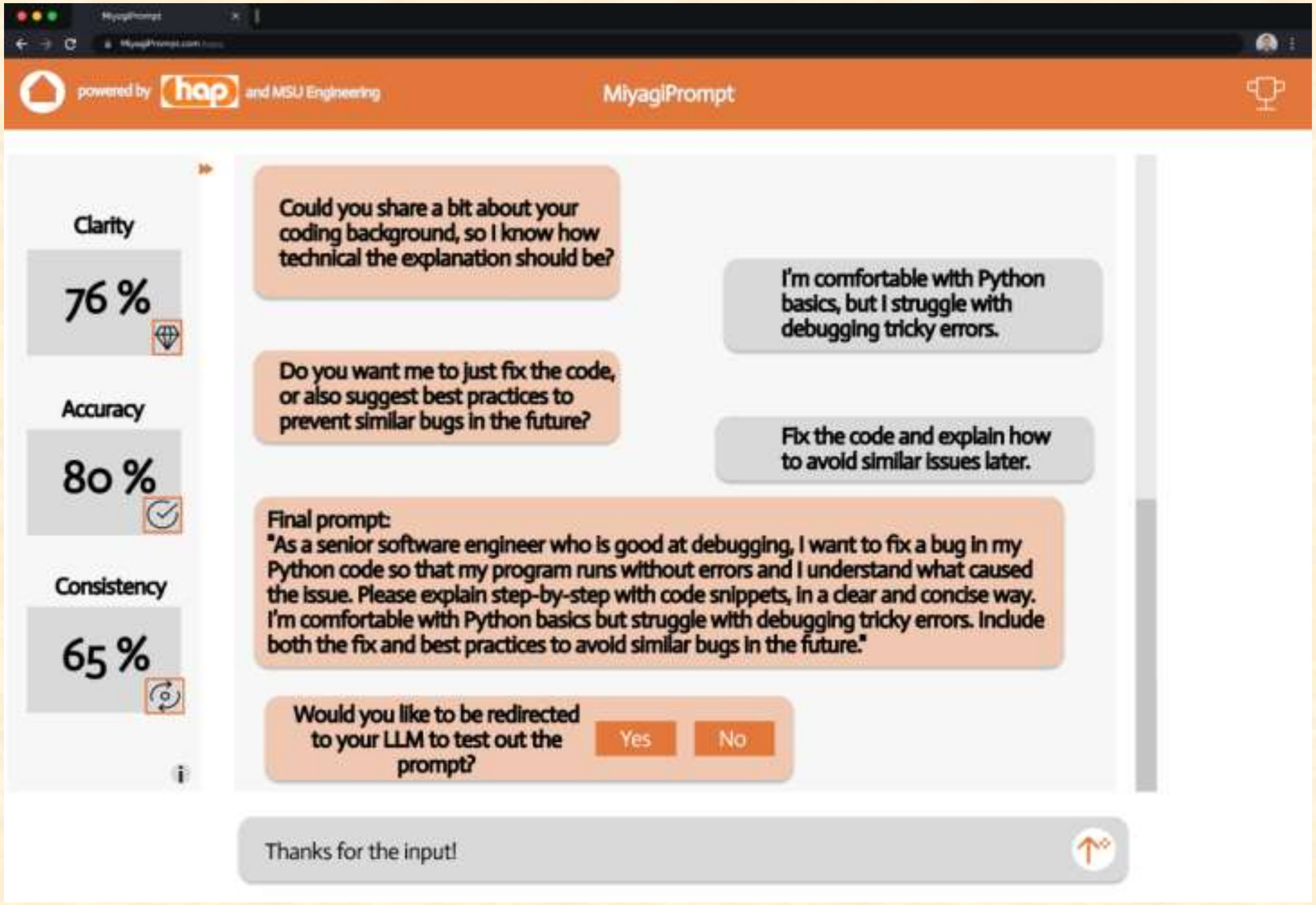
Screen Mockup: Home Page



Hello! I am your prompt assistant for today!

Which LLM model would you like to use today?

Screen Mockup: Prompt Scoring Tab



Clarity
76 %

Accuracy
80 %

Consistency
65 %

Could you share a bit about your coding background, so I know how technical the explanation should be?

I'm comfortable with Python basics, but I struggle with debugging tricky errors.

Do you want me to just fix the code, or also suggest best practices to prevent similar bugs in the future?

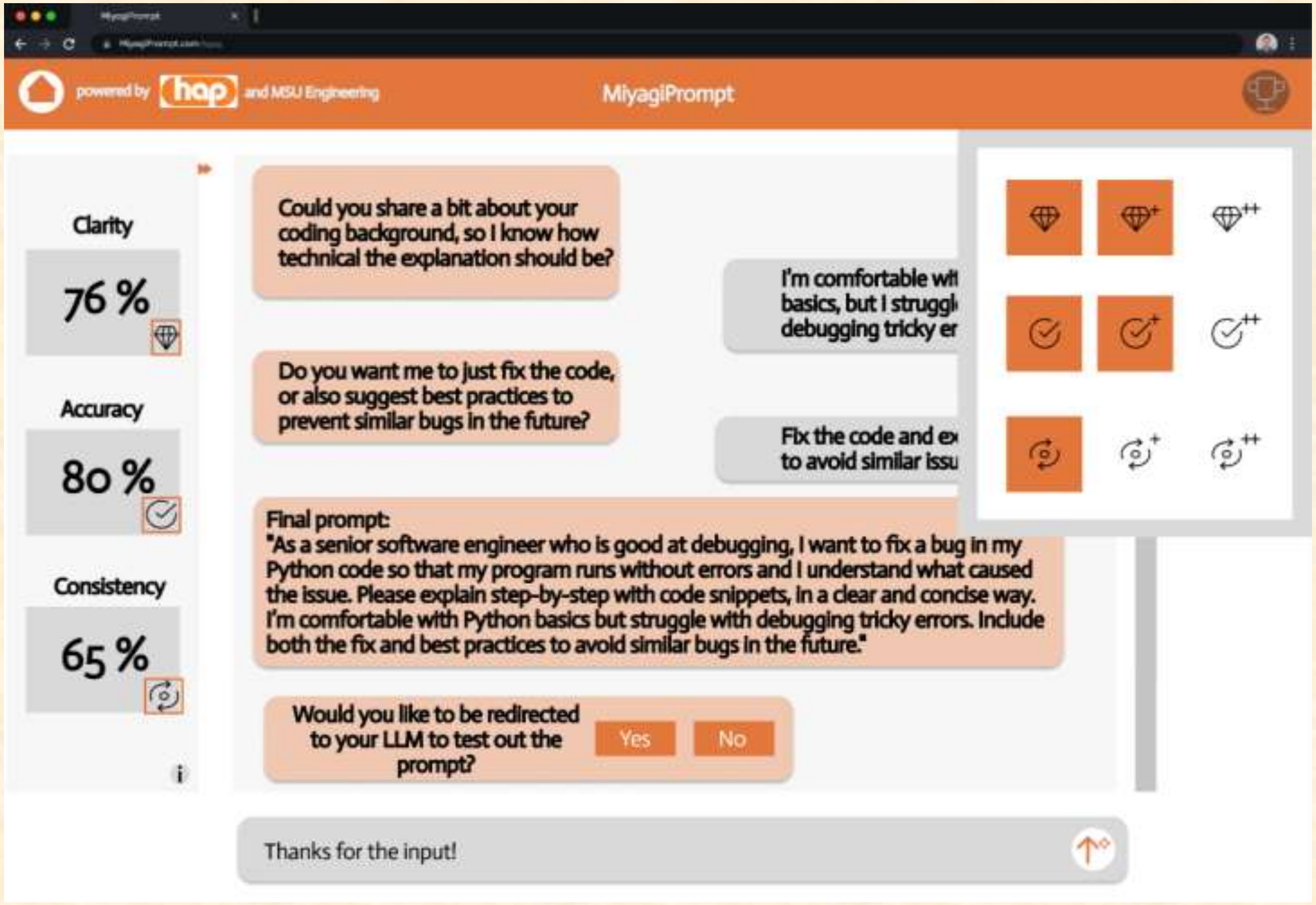
Fix the code and explain how to avoid similar issues later.

Final prompt:
"As a senior software engineer who is good at debugging, I want to fix a bug in my Python code so that my program runs without errors and I understand what caused the issue. Please explain step-by-step with code snippets, in a clear and concise way. I'm comfortable with Python basics but struggle with debugging tricky errors. Include both the fix and best practices to avoid similar bugs in the future."

Would you like to be redirected to your LLM to test out the prompt?

Thanks for the input!

Screen Mockup: Badges Dropdown



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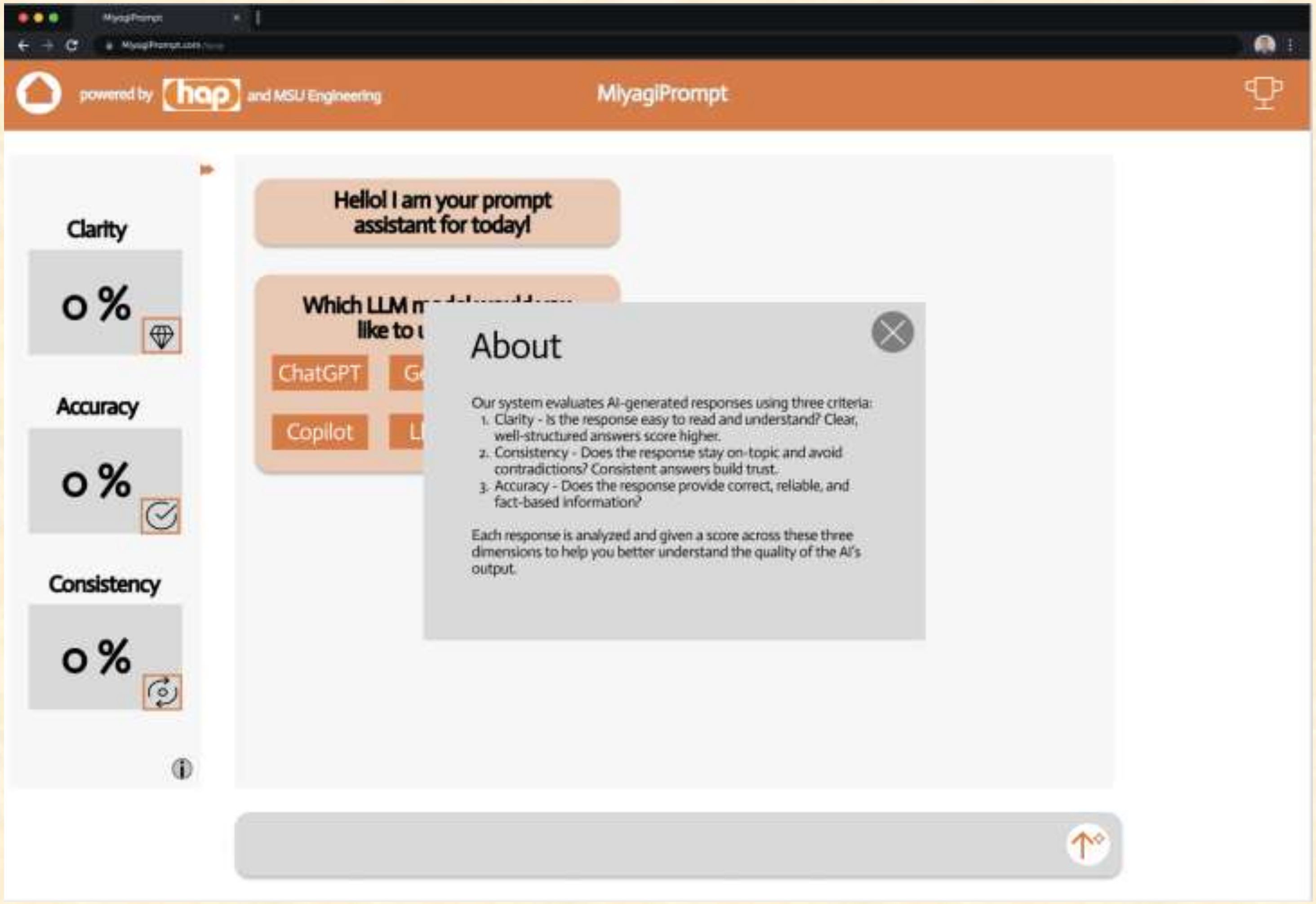
Screen Mockup: About Tab



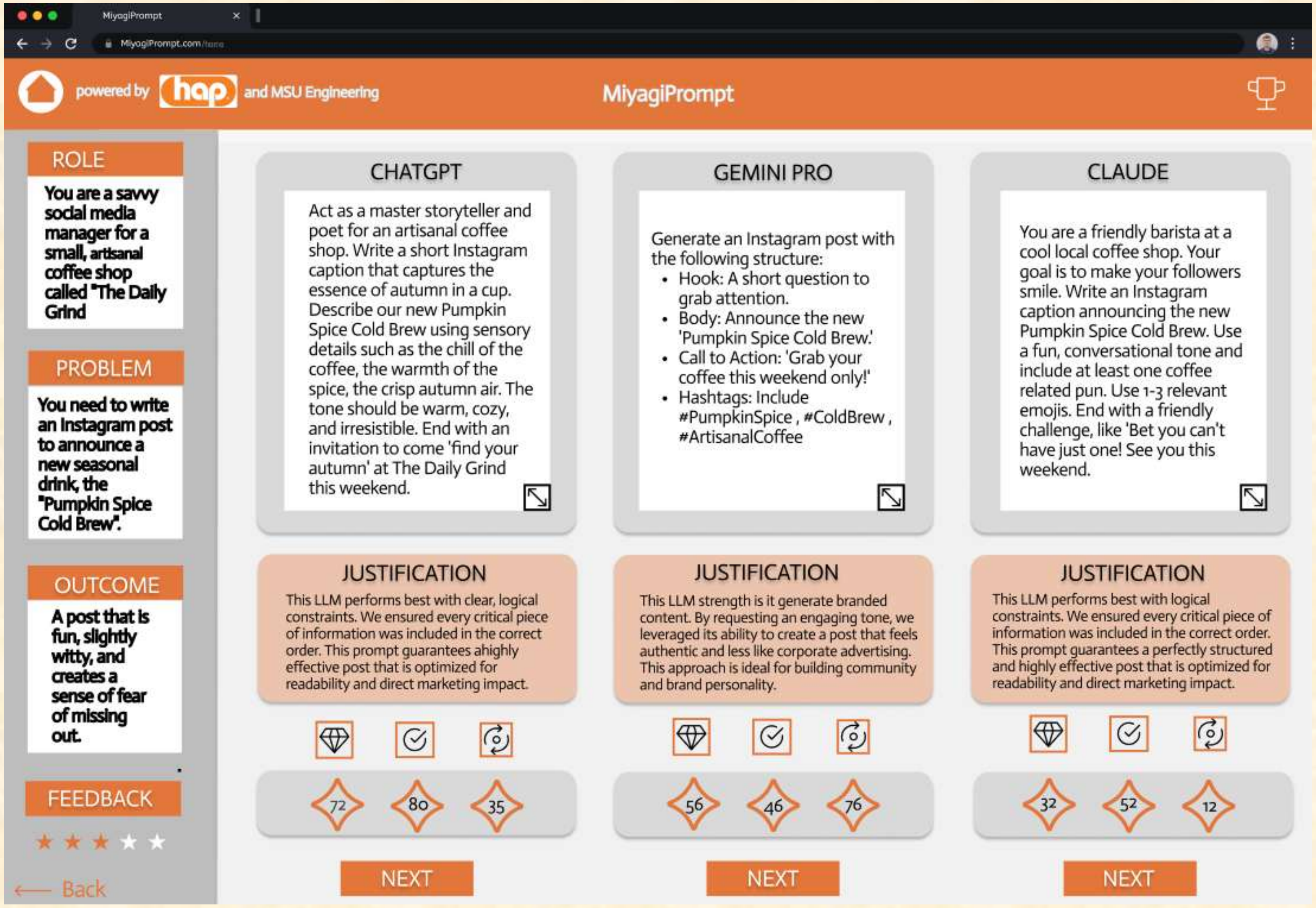
About

Our system evaluates AI-generated responses using three criteria:

1. Clarity - Is the response easy to read and understand? Clear, well-structured answers score higher.
2. Consistency - Does the response stay on-topic and avoid contradictions? Consistent answers build trust.
3. Accuracy - Does the response provide correct, reliable, and fact-based information?

Each response is analyzed and given a score across these three dimensions to help you better understand the quality of the AI's output.

Screen Mockup: LLM Arena



MiyagiPrompt

MiyagiPrompt.com/

powered by hap and MSU Engineering

MiyagiPrompt

ROLE

You are a savvy social media manager for a small, artisanal coffee shop called "The Daily Grind

PROBLEM

You need to write an Instagram post to announce a new seasonal drink, the "Pumpkin Spice Cold Brew".

OUTCOME

A post that is fun, slightly witty, and creates a sense of fear of missing out.

FEEDBACK

★★★☆☆

← Back

CHATGPT

Act as a master storyteller and poet for an artisanal coffee shop. Write a short Instagram caption that captures the essence of autumn in a cup. Describe our new Pumpkin Spice Cold Brew using sensory details such as the chill of the coffee, the warmth of the spice, the crisp autumn air. The tone should be warm, cozy, and irresistible. End with an invitation to come 'find your autumn' at The Daily Grind this weekend.

JUSTIFICATION

This LLM performs best with clear, logical constraints. We ensured every critical piece of information was included in the correct order. This prompt guarantees ahighly effective post that is optimized for readability and direct marketing impact.

72 80 35

NEXT

GEMINI PRO

Generate an Instagram post with the following structure:
- Hook: A short question to grab attention.
- Body: Announce the new 'Pumpkin Spice Cold Brew.'
- Call to Action: 'Grab your coffee this weekend only!'
- Hashtags: Include #PumpkinSpice , #ColdBrew , #ArtisanalCoffee

JUSTIFICATION

This LLM strength is it generate branded content. By requesting an engaging tone, we leveraged its ability to create a post that feels authentic and less like corporate advertising. This approach is ideal for building community and brand personality.

56 46 76

NEXT

CLAUDE

You are a friendly barista at a cool local coffee shop. Your goal is to make your followers smile. Write an Instagram caption announcing the new Pumpkin Spice Cold Brew. Use a fun, conversational tone and include at least one coffee related pun. Use 1-3 relevant emojis. End with a friendly challenge, like 'Bet you can't have just one! See you this weekend.

JUSTIFICATION

This LLM performs best with logical constraints. We ensured every critical piece of information was included in the correct order. This prompt guarantees a perfectly structured and highly effective post that is optimized for readability and direct marketing impact.

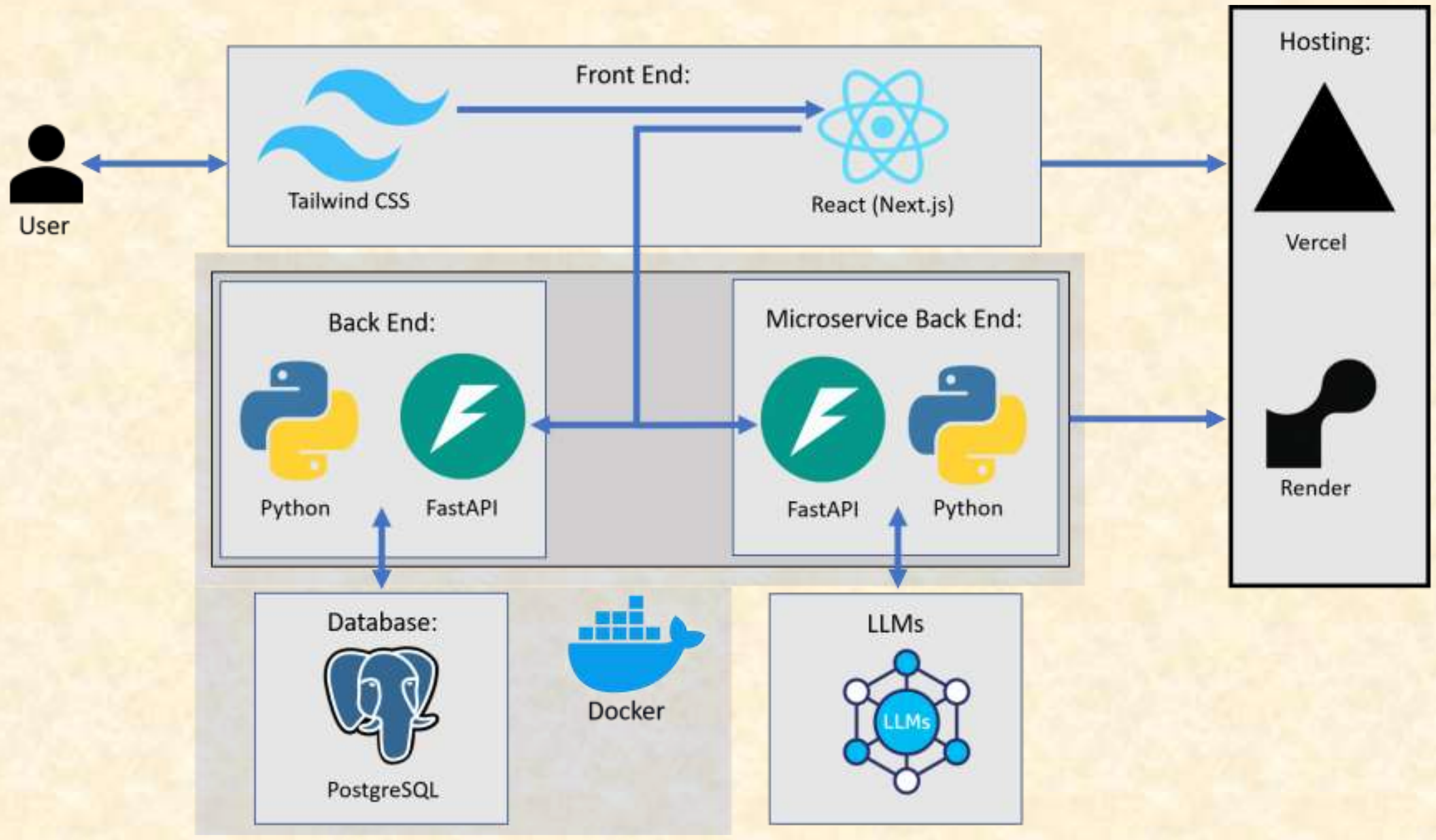
32 52 12

NEXT

Project Technical Specifications

- Built with React + Next.js, hosted on Vercel
- Python with FastAPI, hosted on Render
  - Double Backend Layer
    - API Gateway & Database
    - AI microservice handling double LLM orchestration
      - LLM-A – Executor & LLM-B - Evaluator
- Supabase manages PostgreSQL storage

Project System Architecture



Project System Components

- Hardware Platforms
  - Computer with Internet Access
- Software Platforms / Technologies
  - VSCode
  - Next.js + TailwindCSS + Typescript
  - Python + FastAPI
  - LLMs (ChatGPT, Gemini, etc.)
  - PostgreSQL
  - Render + Vercel
  - Docker

Project Risks

- Risk 1
  - Back end depends on external LLM APIs, which may be slow or unavailable
  - Use error handling, retires, and mock API service; optionally deploy a small local LLM for development
- Risk 2
  - Challenging to evaluate whether our software is working properly as it's hard to define what makes a prompt effective, which in turn makes it difficult to create useful templates
  - Research prompt engineering through courses and online resources, focusing on length, structure, precision, and logic
- Risk 3
  - LLM responses may not return in JSON, causing back-end crashes
  - Guide output with prompt engineering, validate all responses, and log results for debugging
- Risk 4
  - Prompts may perform differently across LLMs, reducing consistency
  - Test across models and keep the top 2-3 best performing prompts

Questions?

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