

Back End Development

17-316/616 Fall 2025

AI Tools for Software Development

<https://ai-developer-tools.github.io>

Austin Henley and Andrew Begel

Reflection prompts to discuss today

1. Discuss the challenges of getting the LLM to create a multi-part front end design or implementation? Describe the difficulties in ensuring 1) correctness of each part, 2) consistency across the parts, and 3) accuracy of the results matching your intentions. Tell us how you would test, validate, and refine the outputs.
2. Discuss the legal and ethical implications of an LLM inadvertently helping you to design a UI that looks like a clone of another application. Have this happened to you before? Have you heard of this happening to others? What would you do if you got an email from the originator of your project's startup saying they saw your clone?

Discussion Instructions

- Instructor announces the reflection question.
- If you chose this reflection question to answer for homework, come up to the front. You are the discussant group.
- Class forms into pairs.
- Pairs and discussant group should now reflect on the question by themselves (4 min)
 - Explain what you think, why, and how you've come to your conclusions.
- Each discussant explains their answer to the class (3 min)

Reflection Prompt

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Reflection Prompt

- Discuss the challenges of getting the LLM to create a multi-part front end design or implementation? Describe the difficulties in ensuring 1) correctness of each part, 2) consistency across the parts, and 3) accuracy of the results matching your intentions. Tell us how you would test, validate, and refine the outputs.

Sign up for reflections

- <https://bit.ly/reflection-week-7>

Application Architecture

Front End User Interface

Infrastructure

Tests

Application Core / Data

Using LLMs for Back End Development

- Can LLMs architect a backend system?
- Can LLMs design an API?
- Can LLMs connect to a database?
- Can LLMs manage authentication safely?
- Can LLMs run all your backend components?

- Can LLMs critique your backend?

Backend Development

- Define layers—API, algorithmic layer, data access
- Routing and API design
- Scalability and performance
- Security—never trust the client!
- Technology stack
 - Server-side language: JavaScript, Python, Java, etc.
 - Framework: Express, Next.js, Svelte, Django, etc.
 - Data: SQL, NoSQL, blob storage
- Mock frontend and write integration tests

Backend coding activity

1. Pair up! Get with a partner that is not on your team.
2. Make a user story for Like, Reject, and Super Like.
3. Generate a dev spec for the user story.
4. Generate the backend code using the user story and dev spec.
5. Install and config the backend.
6. Run and demonstrate that the backend is working.

LLM Prompt Templates

- Ensure reproducible LLMs interactions

You are a <role>.

Your goal is to <task>.

Instructions:

- Analyze <something> for <purpose>
 - Identify specific issues and explain each.
 - Suggest concrete changes or alternate approaches to address the issues
 - The response should be formatted as a list of findings.
- ...

Analysis Focus: <purpose>

...

Whole Class Discussion

- How did this compare to creating the frontend?
- What are the components of your LLM-generated backend?
- Are you confident about what the LLM generated?
- Were you able to run it on the first try?
- How do you test what you can't see?!

Next class

- More backend development
 - Databases
 - Networking
 - External services