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Individual Reflection: Insights from Building Apps with LLMs

During my time working on building DiligenceDynamics this quarter, I learned a lot about building apps that use LLMs, including several new technologies (React Bootstrap, Firebase, Next.js, Flask, Pinecone), general backend engineering concepts, and some valuable inner workings of how AI-based systems work.

From designing and building authentication into the application, I gained experience working at the connection between the frontend and the backend of the app. I implemented components with React and Bootstrap to handle login and signup operations and connected them to a Firebase database. I decided to set up an authentication emulator to keep the process inside a sandbox during development and allow for thorough testing. Looking back now from the end of the quarter, the main thing I learned from the early weeks was a bit more abstract: the importance of planning and design. We spent a good amount of time on need-finding, conducting interviews and doing research on competitors, which was certainly beneficial; however, in hindsight I think our path would have been clearer had we spent more time on design before jumping into implementation.

The next step was making the authentication state visible throughout the application. For this, I implemented an authentication context store auth details such as the currently logged-in user and made frontend changes to accurately reflect login status. This required learning about React contexts and hooks such as useEffect and useState. During this part of the building process, I grew to appreciate Next.js's intuitive routing mechanism and integration with contexts.

Later, I realized that we would need to restructure the backend to separate each user's unique data, including previous conversations with our chatbot, documents uploaded, etc. This was probably the largest headache involved with building the app, as it required changes across multiple frontend components, restructuring our Firestore database where we store users' conversations, and rewriting core backend methods with Python and Flask. If I could build this project again, I would have come up with a more detailed backend design before implementing the RAG pipeline and the frontend, which started out as completely separate things—although we were able to integrate them well in the end. I was happy with our final product, and it was beneficial that our team meshed very well together throughout the quarter.

Overall, working on DiligenceDynamics and learning about building with LLMs was a great experience. I very much liked the open format of the course project and the sprint-oriented cadence, and I would recommend the experience to anyone looking to broaden their experience.