**IS601 Course Reflection**

This course has been one of the most rewarding and challenging experiences at NJIT. It provided hands-on exposure to current industry tools and technologies, such as SQL, Docker, GitHub Actions, FastAPI, and coding design principles. The weekly assignments were well-structured, enabling a gradual skill build-up for both midterm and final projects. As someone that has not done any class like this before, I thought it was challenging enough, yet doable. I was able to learn new skills and enforce these skills into different projects

Coming into this class with minimal python experience, I initially felt overwhelmed by the technologies and methodologies introduced. However, consistent practice and starting assignments early made the learning process more manageable. The projects were a highlight, progressing from basic functionalities to complex implementations, including multi-core processing and integration of tools like Faker and MinIO. Despite challenges like debugging and setting up workflows, I found the journey immensely rewarding as I was able to think more like a developer with every assignment.

One of the key takeaways from IS601 is the importance of adaptability to new technology. It is very unlikely that the future will have the same technology as we do today. Learning to work with various technologies is important, especially in this field. AI can be very helpful to a developer if used the correct way, providing more efficiency to the workplace. Working on tasks like setting up MinIO in GitHub Actions or debugging command-line utilities pushed me out of my comfort zone because in previous assignments I was able to just repeat the steps from the assignment video. These challenges taught me to approach problems methodically and appreciate the learning process. The sense of accomplishment after successfully implementing and running a solution is unmatched. Even when I thought I was getting things closer to being done, I would realize there are some processes that I overlooked and fix them to make the workflow on github correct, yet again. This really taught me a new way of looking to solve different issues. Sometimes one focuses too much on one item that another one is overlooked, I was really able to place more attention to detail with this.

Additionally, the collaborative elements of the course provided valuable insights into real-world development practices. From understanding team collaboration tools to addressing QA and SRE responsibilities, I gained a deeper appreciation for the multifaceted nature of software development. These experiences have strengthened both my technical skills and my ability to work effectively in team environments. I have only ever worked with Github in the past to upload previous work for the sake of allowing employers to view my experience. However, I was now able to see what high value GitHub has to offer when it comes to working with this application to facilitate collaboration methods and using other applications like Docker as well to push programs, rather than just keeping the tests running locally.

Final term Project:

This development project has been an incredibly valuable learning experience, offering a comprehensive and hands-on exposure to real-world software engineering practices. As someone entering backend development with relatively limited experience, I found this project to be a perfect blend of challenge and achievability—it pushed me out of my comfort zone while reinforcing the practical application of skills gained throughout the course.

My primary contribution focused on improving the user profile management system, with a key feature being the integration of Profile Picture Upload functionality using Minio. Minio, a high-performance, S3-compatible object storage system, was chosen for its scalability, simplicity, and seamless integration capabilities. Implementing this feature involved designing and integrating a secure and efficient upload pipeline that enables users to personalize their accounts while maintaining data integrity and performance.

A significant portion of my time was dedicated to writing robust validation logic, ensuring that user-uploaded files met specific criteria (e.g., file type, size limits), and handling potential edge cases such as duplicate uploads, missing metadata, or network interruptions. This helped reinforce my understanding of user input sanitization, exception handling, and creating fault-tolerant systems.

Moreover, I gained substantial experience in integrating third-party services into a backend architecture. Working with Minio taught me how to manage credentials securely, structure object storage hierarchies, and generate pre-signed URLs to handle secure access control—all critical skills in cloud-native application development.

From a broader perspective, this project significantly enhanced my understanding of backend system design, particularly in areas like RESTful API development, data persistence, and modular code structure. I also collaborated with teammates in a structured, version-controlled environment, which helped me better understand workflows involving Git, pull requests, and code reviews.

An essential aspect of the development process was testing and debugging. I used pytest to implement unit and integration tests, ensuring the reliability and stability of the features I worked on. This practice taught me how to write testable code and introduced me to test-driven development principles.

Beyond technical execution, this project gave me a deeper appreciation for user experience. I constantly considered how technical decisions—such as file size restrictions or error messages—would impact the end user. My goal was to create a feature that not only worked but also felt intuitive and responsive.

In summary, this project was a pivotal learning experience that allowed me to:

* Apply backend development principles in a realistic setting.
* Strengthen my knowledge of cloud storage integration through Minio.
* Improve the reliability and user-friendliness of the system through thoughtful error handling and validation.
* Adopt best practices in code quality, documentation, and testing.
* Collaborate effectively in a team-based, version-controlled environment.

It has given me greater confidence in my technical abilities and has equipped me with the foundational skills needed to contribute meaningfully to real-world software projects. I now feel more prepared to tackle complex backend challenges and build scalable, secure, and user-focused systems.

**Links to my work:**

• Project Docker Hub : [Repository](https://hub.docker.com/repository/docker/fernandezl0911/user/general)

• GitHub Actions for automated workflows : [Successful Workflows](https://github.com/Fernandezl7/user_management/actions)

• GitHub Repository: [User Management Project](https://github.com/Fernandezl7/user_management)

**Fixed QA Issues:**

Fix the Docker File to allow build : [Issue 1 link](https://github.com/Fernandezl7/user_management/issues/1)

User ID is passed as None in the user verification email: [Issue 2 link](https://github.com/Fernandezl7/user_management/issues/2)

Enforce strong Password validation: [Issue 3 link](https://github.com/Fernandezl7/user_management/issues/3)

Fix the valid profile picture uploads: [Issue 4 link](https://github.com/Fernandezl7/user_management/issues/4)

Not able to update is professional user field: [Issue 5 link](https://github.com/Fernandezl7/user_management/issues/5)

**Feature Implemented:**

Profile Picture Upload with Minio :[Feature Link](https://github.com/Fernandezl7/user_management/tree/addfeaturetouploadpfp)

**Testing and Quality Assurance:**

Added 10+ test cases: [Link for 10+ test cases](https://github.com/Fernandezl7/user_management/tree/UPDATETESTS)

By implementing these test cases, we can ensure a robust and user-friendly profile picture upload feature, while maintaining the security and reliability of the MinIO storage backend.

In conclusion, IS601 was not only a tough course but also an incredibly enriching one. It has expanded my technical and problem-solving skills, making it a truly unforgettable experience.