CS 3305-01 Web Programming 2

Instructor: Professor Jim Casale

Name: Ryohei Hayashi

Learning Journal 4

**Summary of the Week**

This week, I focused on learning how to generate database-driven content using PHP. By the end of this unit, the goal was to acquire the skills to generate images and PDF files from a database using PHP, as well as to develop a basic understanding of connecting to databases through PHP. Additionally, I learned about important elements in web application development, such as handling database connections and managing sessions, which are essential for server-side programming.

**Personal Reflections**

Through this week’s learning, my understanding of PHP syntax and server-side programming improved significantly. In particular, reviewing PHP control structures such as if statements, for loops, and while loops allowed me to re-examine details that I had not previously paid much attention to, which was highly beneficial. These basic constructs, while simple, play a crucial role in determining the flow of code and directly contribute to more efficient program design. As a result, reinforcing these fundamentals has made me more confident in my ability to write code.

Regarding server-side programming, I had been mostly focused on frontend development up to this point, so I was unfamiliar with building web applications using PHP. However, by learning basic backend skills such as database connections and session management, I was able to gain a deeper understanding of how the entire web system works. Since my past experience was concentrated on frontend UI/UX, I had fewer opportunities to understand how backend processes integrate, but this week’s learning allowed me to grasp the overall flow of the application. Session management, in particular, is crucial for handling user authentication and maintaining state, and I feel this knowledge will be highly valuable for future development.

Moreover, learning how to dynamically generate images and PDFs from a database using PHP expanded my understanding of what web applications can do. Previously, my work was limited to generating static content, but now I find it fascinating that integrating a database allows for more flexible and interactive content delivery. This kind of learning serves as a foundation for more effective collaboration between the frontend and backend and represents a significant step toward more comprehensive system design.

**Topics Studied in Depth**

This week, I focused heavily on PHP-based database connection processes and the importance of session management. Connecting to a database and providing real-time data to users is a core aspect of web applications. In the past, I had only dealt with calling APIs from the frontend to retrieve data, so gaining a deeper understanding of how data is processed on the server side before being passed to the frontend was a major takeaway. Learning how to write queries for databases and techniques for optimizing them is directly linked to designing more efficient web applications. Understanding how to maintain performance while handling large amounts of data is crucial knowledge that will be very useful in future development.

Additionally, I delved into session management, learning about methods for safely managing user authentication and state. Sessions are essential for identifying users between login and logout and are vital for ensuring the security of web applications. Particularly, understanding session management and safe operation methods as countermeasures against threats such as session hijacking and cross-site scripting (XSS) was important. Through this learning, I was able to comprehend how to address these risks effectively.

I also studied in depth how to generate dynamic images and PDFs using PHP. This allows personalized content to be delivered to users based on information stored in the database, greatly enhancing the flexibility of web applications. For instance, when a user updates their account information, it is possible to dynamically generate a PDF version of a contract based on that data, which opens up many business use cases. These technologies are particularly useful for e-commerce sites and customer support systems, and I found this extremely valuable.

**Future Challenges and Goals for Next Week**

Next week, I will focus on learning how to install and configure e-commerce applications, and aim to acquire the skills to operate them. Specifically, understanding the measures necessary to secure these applications will be a key challenge going forward. I aim to deepen my knowledge of server-side technologies and apply them to future projects. Furthermore, by engaging in next week's learning activities, I hope to build on what I have learned so far and develop more practical skills.

Word Count: 720