

# Assignment 1 Report

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This report provides a comprehensive overview of the development process for our recent project, Spring Social, an application developed using Spring Boot, integrated with MongoDB, and containerized through Docker. We delve into the architectural decisions, outline the substantial challenges we encountered, and reflect on the lessons our team learned during this journey.

## Challenges Faced

During the development, we encountered several significant challenges, particularly concerning the integration of new technologies like Docker and Spring Boot, and their interaction with MongoDB.

- **Docker Integration:** One of the initial hurdles was with Docker containers. Compatibility issues arose, especially notable on macOS. The 'gradle:8-jdk17-alpine' image failed to build, prompting us to switch to 'gradle:8-jdk17', which was a more suitable environment for our needs.
- **MongoDB Connectivity:** Establishing a stable connection between our application and MongoDB was more challenging than we anticipated. Various connectivity issues arose during the initial setup, which required us to delve into extensive troubleshooting to establish a robust link.
- **Authentication Implementation:** The process of setting up authentication was daunting, particularly integrating it within the Spring framework. We faced several setbacks in ensuring secure, reliable authentication and session management.
- **JPA Conflicts with MongoDB:** A significant challenge was attempting to integrate JPA — typically used with SQL databases — while employing MongoDB, a NoSQL database. This integration was problematic due to the inherent differences between SQL and NoSQL databases, leading to several conflicts and exceptions. We realized the need for a different approach or tool, specifically tailored for MongoDB, to handle our application's object-relational mapping effectively. This learning curve was steep, but crucial, as it redirected our strategy towards utilizing frameworks more compatible with NoSQL databases, like Spring Data MongoDB.
- **Testing Difficulties:** Our team encountered unexpected hurdles in setting up and executing effective tests. These challenges stemmed from our unfamiliarity with the frameworks, as well as specific issues in simulating real-world scenarios for our application. It required a concerted effort to understand and implement comprehensive testing practices.

## Lessons Learned

This project was an invaluable learning experience for our team, particularly in understanding how to work with Docker, Spring Boot, and external APIs

- **Research and Debugging:** We learned the importance of thorough research before beginning development and the necessity of deep-diving into errors to understand and fix them effectively.
- **Time Management and Realistic Planning:** One of the most critical lessons learned was the significance of realistic project planning. Given our foundational level of knowledge at the project's onset and the complexity of the technologies involved, the time allocated for this assignment was extremely tight. The lack of ample support and resources further compounded this issue. We found that the timeframe was somewhat unrealistic, not affording us the necessary space to fully grasp new concepts and apply them effectively. This experience taught us the importance of advocating for realistic deadlines, especially when embarking on complex tasks with a relatively green understanding.
- **Team Collaboration:** Effective team communication was crucial, especially when debugging complex issues. It was beneficial to leverage different team members' strengths.
- **Importance of Testing:** We understood the critical role of testing in software development, ensuring each application component functions as expected, and learned various testing approaches suitable for different scenarios.
- **Embracing New Technologies:** Despite the steep learning curve, the experience gained in new technologies like Docker and Spring Boot was invaluable. It underscored the importance of continuous learning in technology.

## Conclusion

The journey of developing Spring Social was filled with both challenges and triumphs. It pushed us to extend our boundaries, especially in understanding and implementing new technologies. The issues we faced with Docker containers, MongoDB connectivity, authentication, and JPA integration were daunting but served as significant learning points. Despite these challenges, the team's resilience and resourcefulness enabled us to address these problems, learning valuable lessons along the way. As we move forward, we take these learnings with us, confident they will aid in navigating future projects with similar technical demands.