PROJECT 2 INDIVIDUAL T1

**Supervisor: NW Wessels**

**Group 2**

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**Surname: Mchophele**

**Student Number: 240455789**

1. **My Role in the Group**

I was given the role of being a Back-End Developer for this project. My major duty is to create and manage the Safety Alert Application’s server-side logic using Java. This entails concentrating on security and performance while guaranteeing smooth communication between the database and the front end.

**Tasks That Were Easy**

Some aspects of backend development came naturally to me, like creating simple API endpoints and establishing the first project structure. Because I had previously worked with databases, setting up the database connection and creating simple SQL queries were also not too difficult.

**Challenges Encountered & Solutions**

Debugging complicated backend issues took a lot of effort, and I first had trouble creating appropriate authentication techniques and optimizing API response times. Ensuring secure data flow between the frontend and backend was one of the main challenges I faced.

To overcome these challenges, I plan to:

* Use better logging techniques and more familiarize myself with debugging tools.
* Study and follow best practices for this such as encrypting user data and preventing SQL injection.
* Make sure to measure my work in smaller, doable milestones to ensure continued progress.

1. **Task Completed**

As a Back-End Developer, I have accomplished the following:

**Completed Tasks:**

* Implementing and modeling backend logic using Java.
* Implementation of elementary API endpoints for front-end to back-end communication.
* Receiving data from SQL and writing simple SQL data storage and retrieval queries.
* A Simple User Authentication for Log in.

**Tasks in Progress:**

* Securing user data by encrypting and securing vulnerabilities.
* Optimizing SQL queries and improving query response times.
* API testing for the proper functioning of front-end and back-end.
* User role management for access control.

**What Was Difficult vs. What Was Easy**

* **Easy:** Creating simple SQL queries and API endpoints was easy; they have a structured format.
* **Difficult:** Tackling authentication problems debugged easily, handling complex database queries demanded better analytical thinking skills and troubleshooting techniques.

1. **What I Have Learned**

This project has helped me learn a lot, not only technical skills but also soft skills.

**New Technical Skills Learned:**

* **Backend Development in Java:** Engineered a section of the flight reservation app, enhancing my Java frameworks and API development skills.
* **Database Management:** Worked on optimized SQL queries and efficient structuring of databases.
* **Security Best Practices:** such as encryption techniques, user authentication, data protection measures etc.
* **API Integration:** Grasped how to enable smooth interaction between front-end and back-end.

**Soft Skills Developed:**

* **Problem-Solving:** Finding errors and debugging through failed states and backend issues has taught me to think critically.
* **Time Management:** Having a schedule with deadlines and prioritized work have honed my productivity.
* **Team Collaboration:** Collaborating with the fronted has sharpened my skills in communication and coordination.
* **Adaptability:** I learnt to be tempered by unexpected technical challenges that come with the profession.

1. **In Conclusion**

Although my experience with backend development is still in its infancy, I have already learned a lot about creating safe and effective systems. Even though I’ve had difficulties, including troubleshooting complicated issues and improving API performance, I’m steadily improving. My goals going forward are to improve backend performance, strengthen security implementation, and promote improved teamwork.

I’m sure I can improve my backend development abilities and make a significant contribution to our project’s success with continued education and work.