CS 499

Professional Self-Assessment

Throughout my journey in the Computer Science program, I have developed technical expertise, analytical problem-solving abilities, and a security-focused mindset that aligns with my long-term goal of contributing to a safer digital environment. My ePortfolio represents the culmination of this growth and demonstrates my competency across software engineering, algorithms and data structures, databases, and secure development practices. The centerpiece of my portfolio is the Event Tracker Android Application, which I enhanced across multiple dimensions to illustrate measurable technical progress and alignment with the program's five learning outcomes.

The Event Tracker Android Application serves as a comprehensive artifact because it integrates mobile development, structured algorithms, database management, and secure coding principles within a single cohesive system. Through systematic refactoring and enhancement, I transformed the application from a functional academic project into a more professional, modular, secure, and scalable solution. These improvements demonstrate not only technical proficiency but also my ability to critically evaluate and improve existing systems.

Demonstration of Program Outcomes

Collaborative and Organizational Decision-Making

Throughout this project, I engaged in structured code review practices and incorporated instructor feedback to refine my enhancement plan. The process mirrored real-world

collaborative development environments, where peer review and iterative improvement are essential. By documenting my analysis and articulating design trade-offs in my narratives and video code review, I demonstrated my ability to support organizational decision-making with clear technical reasoning.

Professional Communication

My ePortfolio includes written enhancement narratives, structured documentation, and a recorded code review. These elements demonstrate my ability to communicate technical content clearly and professionally to diverse audiences. I focused on explaining not only *what* I built, but *why* certain architectural and algorithmic decisions were made, and how those decisions affect scalability, maintainability, and security.

Algorithmic Design and Problem Solving

For the algorithms and data structures category, I enhanced the event search, filtering, and sorting logic within the application. I optimized data handling within the RecyclerView adapter, reduced unnecessary nested iterations, and improved time complexity where possible. I evaluated trade-offs between simplicity and efficiency and documented the reasoning behind algorithmic improvements. This demonstrates my ability to design and evaluate computing solutions using sound algorithmic principles.

Software Engineering and Technical Implementation

In the software engineering and design category, I refactored the application architecture to improve modularity and maintainability. I strengthened input validation, enhanced exception handling, improved code organization, and eliminated redundant logic. These changes demonstrate proficiency in Android development, lifecycle management, UI responsiveness, and

adherence to clean coding standards. The artifact shows my ability to use well-founded and innovative techniques to implement solutions that deliver value.

Security Mindset and Risk Mitigation

Security has been a consistent theme throughout my academic and professional goals. In the database enhancement phase, I improved SQLite schema validation, implemented safer query execution practices, validated all imported user inputs, and strengthened error handling. These enhancements demonstrate my ability to anticipate adversarial exploits such as injection risks, improper input handling, and data integrity vulnerabilities. By integrating security practices directly into the design and implementation phases, I show that I do not treat security as an afterthought.

Growth and Reflection

Enhancing the Event Tracker Android Application required me to transition from simply "making it work" to engineering it for maintainability, scalability, and security. I learned that writing code is only one part of professional development; evaluating trade-offs, documenting decisions, and anticipating failure conditions are equally critical.

One challenge I encountered was balancing performance improvements with readability and maintainability. In some cases, algorithmic optimizations increased structural complexity, requiring additional documentation to preserve clarity. Another challenge involved ensuring database operations were both efficient and secure while maintaining responsiveness in the mobile environment.

Through this process, I strengthened my debugging, refactoring, and architectural thinking skills. I also gained a deeper appreciation for secure software development lifecycle practices and defensive programming.

Alignment With Career Goals

My long-term career objective is to work in cybersecurity or secure software engineering. This ePortfolio directly supports that goal by demonstrating:

- Secure application development practices
- Database security considerations
- Algorithm optimization and logic refinement
- Modular software architecture
- Professional documentation and communication skills

The enhancements made to the Event Tracker application reflect my ability to design secure, efficient, and maintainable systems skills that are essential in cybersecurity roles, security engineering positions, and advanced software development environments.

Conclusion

This ePortfolio represents measurable growth in technical competency, critical analysis, and professional communication. Through the enhancement of the Event Tracker Android Application, I have demonstrated progress toward all five Computer Science program outcomes. The portfolio provides concrete, verifiable evidence of my skills in software design, algorithms, database implementation, and security-focused thinking.

As I move forward in my career, I will continue building upon these foundations, pursuing advanced certifications and expanding my expertise in secure system architecture and defensive programming. This ePortfolio is not only a representation of my academic achievements but also a professional foundation for the next stage of my career in computer science.