**CS 499 – Milestone Two: Software Design and Engineering Enhancement Narrative**

Artifact Title: Travlr Full Stack Web Application  
Enhancement Focus: Secure RESTful API & Modularized Backend Logic  
Branch Used: final-capstone

**1. Briefly describe the artifact. What is it? When was it created?**

The artifact I selected for this enhancement is a full-stack MEAN (MongoDB, Express, Angular, Node.js) web application called Travlr, developed during my CS 465: Full Stack Development course at SNHU. The application allows users to browse travel destinations and enables administrative functionality such as managing trips through secure login. Originally, the app had basic routing and minimal authentication logic. The artifact was created in June 2025 and represents my most comprehensive portfolio project.

**2. Justify the inclusion of the artifact in your ePortfolio. Why did you select this item? What specific components of the artifact showcase your skills and abilities in software development? How was the artifact improved?**

I chose this artifact because it demonstrates both my technical and architectural understanding of full-stack development, including REST API design, modular backend structures, and secure authentication workflows. These skills directly reflect key computer science outcomes such as software design, problem-solving, and secure system architecture.  
  
In the original version, the backend contained logic that was functionally correct but lacked modular separation and robust authentication. User authentication was either missing or insecure. Through this enhancement, I implemented proper JWT-based login and registration, restructured the Express controllers and models for clarity, and added secure routing middleware. These improvements not only enhanced maintainability but also reflected real-world engineering standards.

**3. Did you meet the course outcomes you planned to meet with this enhancement in Module One? Do you have any updates to your outcome-coverage plans?**

Yes, the enhancement met the outcomes I planned in Module One, specifically:  
  
- Software Design and Engineering: I successfully implemented modular components and RESTful API logic aligned with professional industry standards.  
- Security Practices: By applying authentication middleware and handling JWTs securely, I showed competency in backend access control and secure data flows.  
- Problem Solving & Code Quality: Refactoring previously entangled logic into clean controller and model layers reflected a deeper understanding of scalable application structure and maintainability.

**4. Reflect on the process of enhancing and modifying the artifact. What did you learn as you were creating it and improving it? What challenges did you face?**

Through this enhancement, I deepened my understanding of middleware-driven authorization, JWT lifecycle management, and modular file structure design in Node.js. One of the most valuable lessons was learning how to balance functionality and security. I realized that simply making routes “work” wasn’t enough—proper access controls and structure were equally critical.  
  
A few challenges I faced included:  
  
- Debugging middleware stack order in Express, especially when token validation was silently failing.  
- Registering Mongoose models in the correct scope to avoid runtime errors.  
- Ensuring frontend compatibility with secure backend changes for future integration.  
  
Despite these hurdles, I was able to troubleshoot, refactor, and finalize a version that significantly improved the artifact’s structure and reliability.

**Final Notes**

This enhancement serves as a cornerstone in my ePortfolio by illustrating the culmination of full-stack development, modular software design, and secure system practices. It not only highlights technical proficiency but also reflects my ability to take ownership of an evolving project, revise and secure it thoughtfully, and meet professional expectations in software engineering.