For my senior design project, I am developing a Smart Parking App, a mobile application that provides real-time information about available parking spots in busy areas. This project focuses on three key areas: IoT, mobile app development, and data analytics. As someone who commutes to campus and experiences the daily struggle of finding parking, I am particularly motivated to create a solution that can alleviate this problem for others. The project will leverage sensor technology to gather data on parking spot availability, and the app will analyze and display this data for users through an intuitive interface. My academic background in computer science has prepared me to tackle the technical challenges involved in developing such a complex system.

Throughout my college career, I have taken courses that directly contribute to my ability to develop this project. For example, in *CS1021C: Computer Science 1* and *CS2028C: Data Structures*, I gained a solid foundation in algorithms and programming concepts that will be crucial for building efficient backend systems. *CS4092: Database Design and Development* has provided me with the necessary skills to design a database capable of storing and retrieving real-time parking data. Additionally, *CS4033: Artificial Intelligence: Principles and Applications* introduced me to machine learning techniques, which I may use for predictive analytics to forecast parking availability. These courses have equipped me with both the theoretical knowledge and practical skills necessary for building an IoT-based mobile application.

My co-op experiences have further honed my technical and non-technical skills, which I will apply to my senior design project. At Siemens Digital Industries Software, I worked as a Software Development Co-op, where I improved the functionality of Siemens NX CAD software using C++. I developed strong problem-solving skills by addressing bug reports and implementing new features. Additionally, my experience at Paycor, where I worked as a Software Engineer Co-op, helped me gain experience with Java, Spring Boot, and Angular. I improved database performance and containerized applications using Docker, all while working in an Agile environment. These experiences taught me the importance of scalability, security, and collaboration, which I will apply when developing the Smart Parking App.

I am particularly excited about this project because it addresses a real-world problem that I encounter every day. As a commuter, the frustration of finding parking spaces inspired me to design a solution that would make parking more efficient. My preliminary approach involves using sensor technology in parking lots to detect available spots, which will then be displayed in real-time through a cross-platform mobile app built with Dart/Flutter. Additionally, I plan to use data analytics to provide users with insights on peak parking times and potential availability. The project aims to offer a smooth, user-friendly experience and make campus parking less of a hassle for commuters like myself.

To evaluate the success of my contributions, I will focus on both technical functionality and user feedback. I will know that I have done a good job when the app functions reliably, provides accurate real-time data, and receives positive feedback from beta testers. The app should seamlessly integrate with the IoT sensors, deliver fast responses, and provide helpful parking predictions. Additionally, I will measure my success through code quality, thorough testing, and adherence to best practices in software engineering. If the app is scalable, secure, and meets the project’s functional requirements, I will consider it a success.