Design Document

Smart Park

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Academic year :

2024/2025

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1- General Overview

The **Smart Park** mobile application addresses the pressing challenges of urban traffic congestion and limited parking availability. With increasing vehicle numbers in cities, drivers often struggle to find open parking spots, leading to wasted time, fuel, and increased emissions. Smart Park provides real-time parking availability to help drivers quickly locate spaces, easing congestion and supporting more sustainable urban mobility. This solution optimizes parking resources, enhances the driving experience, and contributes to a more efficient and eco-friendly urban environment.

2- UML Diagram

2-1-Use case Diagram

This diagram illustrates the key functionalities of the smart parking system. It shows how users can authenticate their access, view available parking spots, receive real-time updates, and find the nearest parking location. Additionally, it highlights the roles of administrators who can manage users and parking facilities, including adding and deleting parking spots.

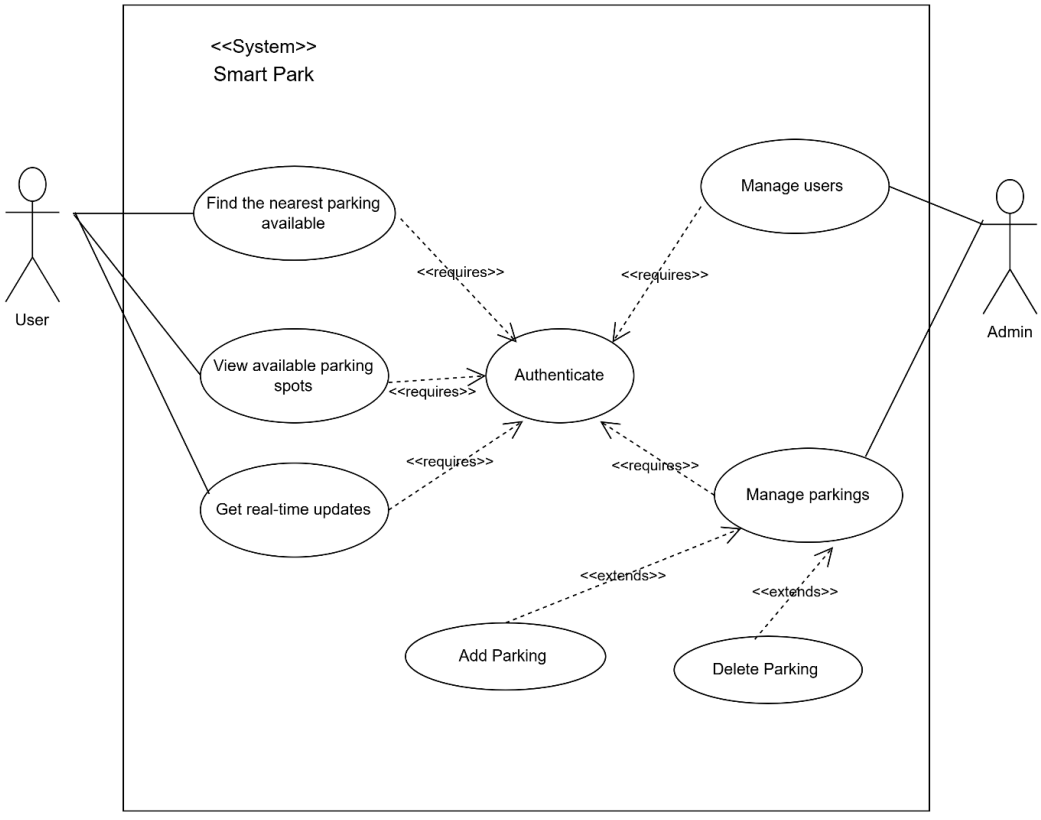

Figure 1 : Use Case Diagram

2-2- Class Diagram

The class diagram illustrates the architecture of the smart parking management system. It highlights the main entities, such as Parking, Spots, Sensor, Vehicle, and User, along with their relationships.

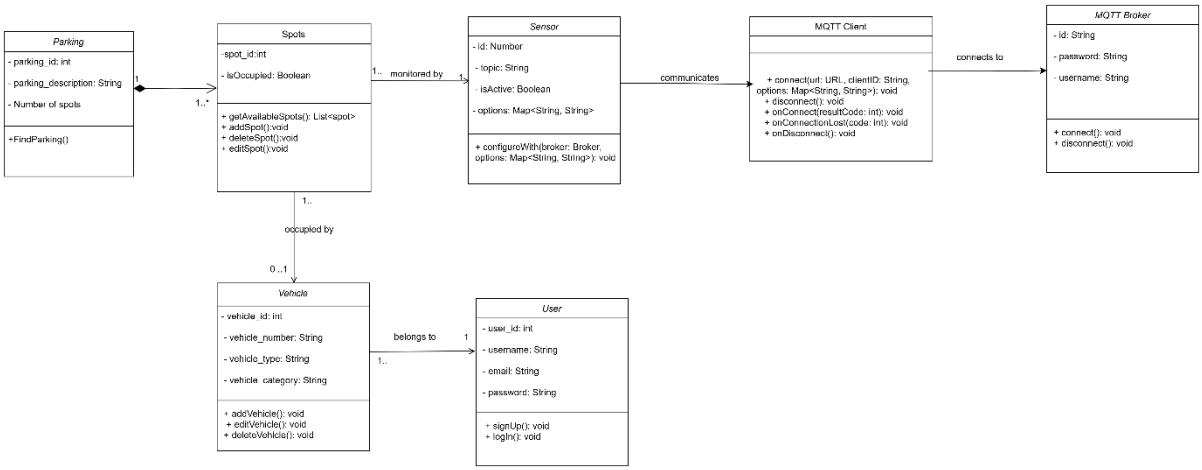

Figure 2: Class Diagram

2-3- Sequence Diagrams

In our progressive web application, we have adopted the MVVM (Model-View-ViewModel) pattern. The following sequence diagrams illustrate the interactions among various components within the system.

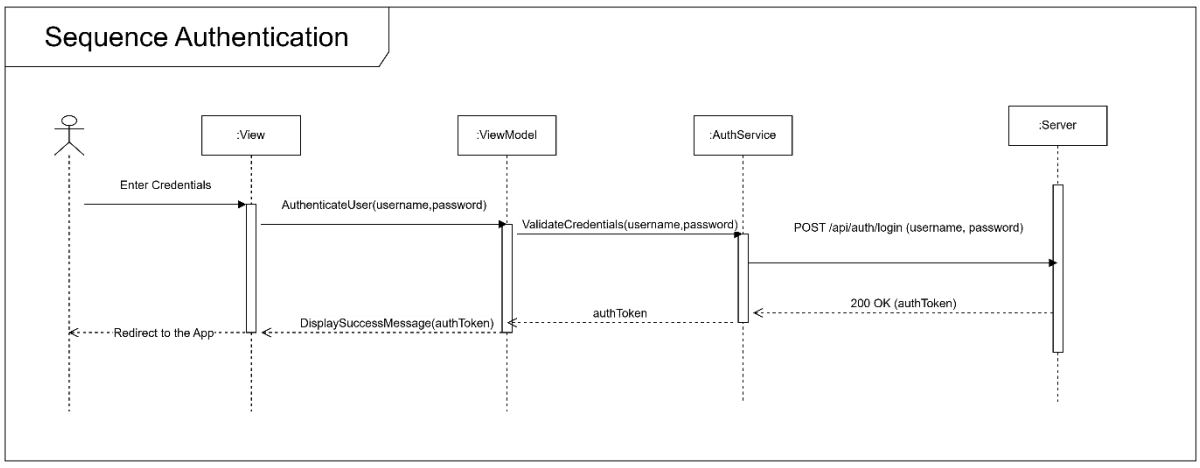

Figure 3: Sequence Authentication

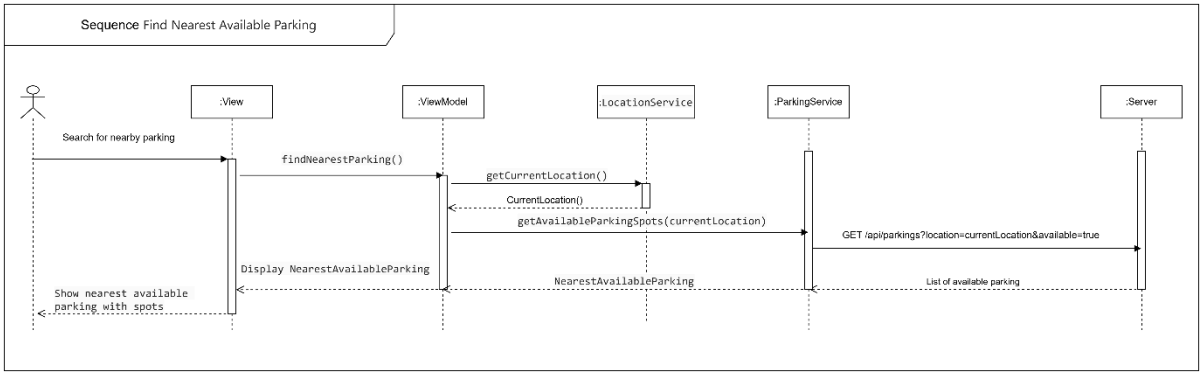

Figure 4: Sequence Find Nearst Available Parking