**Smart Parking**

INTERNET OF THINGS GROUP2

# PROBLEM STATEMENT:

The project aims to develop a Smart Parking solution that leverages IoT (Internet of Things)technologytoenhanceparkingmanagementanduserexperience.Thissystemwill provide real-time information about parking space availability, optimize parking space allocation, and streamline the parking process for both parking lot operators and users.

# Objectives:

Totacklethesechallenges,weaimtoachievethefollowing objectives:

**Real-timeSpaceMonitoring:**Theprimaryobjectiveoftheprojectistoimplement IoTsensorsandcamerastoenablereal-timemonitoringofparkingspaceoccupancy. Byachievingthis,thesystemwillprovideup-to-the-minuteinformationonavailable parking spaces.

**OptimizedSpaceAllocation:**Theprojectseekstodevelopsophisticatedalgorithms that will dynamically allocate parking spaces based on real-time demand. This optimizationaimstoeliminateovercrowdingincertainareaswhileensuringefficient utilization of parking space.

**User-friendly Mobile App:** A user-centric mobile application will be created to empower users with the ability to check parking space availability, reserve spots, and make contactless payments. This app will provide a seamless and convenient experience for drivers.

**Automated Entry/Exit Systems:** Implementing automated entry and exit systems usingRFIDcardsorlicenseplaterecognitionisakeyobjective.Thesesystemswill streamlinetheaccessprocess,reducingwaittimesandenhancingoverallefficiency.

**Data-drivenInsights:**Theprojectaimstocollectandanalyzehistoricaldatatogain insights into parking patterns, peak usage times, and user behavior. These insights will inform future improvements and parking facility expansions.

**Reduction in Congestion:** By providing real-time parking information and optimizing space allocation, the project intends to reduce traffic congestion in and around parking facilities. This will result in smoother traffic flow and a reduced environmental impact.

**EnhancedUserExperience:** Improvingtheoverallparkingexperienceforusersis a central objective. This includes minimizing the time spent searching for parking, reducing payment hassles, and ensuring a hassle-free entry and exit process.

**ScalabilityandAdaptability:**Thesystemwillbedesignedwithscalabilityinmind toaccommodateagrowingnumberofparkinglotsandusers.Thisobjectiveensures that the solution remains relevant and effective in the face of changing needs.

**Cost Efficiency:** The project aims to reduce operational costs for parking lot operators by optimizing space usage and automating processes. This will lead to increased profitability for operators.

**Environmental Impact:** By reducing the time spent searching for parking and optimizing traffic flow, the project intends to contribute to a reduction in carbon emissions and overall environmental impact associated with urban parking.

# DESIGNTHINKING:

In this phase, we will delve into the project's problem statement and outline a comprehensive design thinking approach to address it effectively.

**Understandingthe Problem:**

Thecurrentstateofparkingmanagement inurbanareasfacesseveral challenges:

**ParkingSpace Availability:** Users often struggle to find available parking spaces, leading to congestion and frustration.