# Software Requirements Specification (SRS) for Smart Parking System

1. **Introduction**:
   1. **Purpose:** This document details the functional and non-functional requirements for Smart Parking System. The system aims to automate parking processes, optimize space utilization, provide a seamless user experience, and manage parking fees based on vehicle type and parking duration.
   2. **Scope:** This system will manage parking operations within a designated parking lot, providing:

* Automatic vehicle entry/exit determination.
* Differentiated fees for various vehicle types (motorcycles, cars, truck etc.).
* Automatically assigns available spot to user.
* Automated parking fee calculation based on time.
  1. **Definitions, Acronyms, and Abbreviations**
* UI: User Interface
* API: Application Programming Interface
* SRS: Software Requirements Specification

1. **Overall Description:**
   1. **Product Perspective:** The Smart Parking System will allow the parking and shows occupied when full.
   2. **Product Functions Key** functions include:

* Vehicle identification and classification.
* Parking duration booking and management.
* Automated fee calculation and payment processing.
* Occupied slot detection and prevention.
* Safety system for any hazardous event.
  1. **User Characteristics:**
* Parking Users: Individuals parking vehicles.
* System Administrators: Personnel managing the system such as managing vehicles, theft and fire alarm.

1. **Specific Requirements (Functional Requirements):**
   1. **Vehicle Entry/Exit Management:**

* Automatic detection of vehicle entry and exit.
* Classification of vehicles into predefined types (motorcycles, cars, etc.).
* Recording of entry and exit timestamps.
  1. **Parking Slot Management:**
* Real-time monitoring of parking slot occupancy status.
* Prevention of parking in occupied slots with clear warning messages.
  1. **Parking Duration Booking:**
* System records booked slots and their corresponding timeframes during check-out.
  1. Fee Calculation and Payment:
* Automated calculation of parking fees based on vehicle type and parking duration.
* Per hour calculations.
* Different fee rates for different vehicle types.
* Generation of receipts.

1. **System Features:**

* **Real-time Availability Display:** Shows available parking slots for each vehicle type on a display or app.
* **Automated Fee Calculation:** Calculates parking fees based on vehicle type and time spent.
* **Occupancy Detection:** Informs users from parking in occupied spots.

1. **Use Cases:**
   1. Park a Vehicle:

* User arrives at the parking lot.
* System identifies the vehicle.
* User selects a free slot (or is automatically assigned one).
* System records entry time.
* User parks the vehicle.
  1. Exit Parking Lot:
* User approaches the exit.
* System identifies the vehicle.
* System calculates parking fees.
* User makes payment.
* User is also allowed to park their vehicle multiple times.
* System opens the barrier.
  1. Staff interface
* Schedule maintenance.
* Log maintenance
* Perform automated minor maintenance like self-diagnostic test.
* Handle fire and theft emergency.