PES UNIVERSITY, BANGALORE

Department of Computer Science and Engineering

DBMS

SOFTWARE REQUIREMENTS SPECIFICATION

for

PESU PARKING MANAGEMENT SYSTEM

Version 1.0 approved

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PES University

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PROBLEM STATEMENT

Inefficient and disorganized parking management within the college campus results in congestion, confusion, and inconvenience for students, faculty, and visitors. This project aims to develop a Parking Management System to streamline parking operations, enhance user experience, and ensure efficient utilization of parking spaces, contributing to a safer and more organized campus environment.

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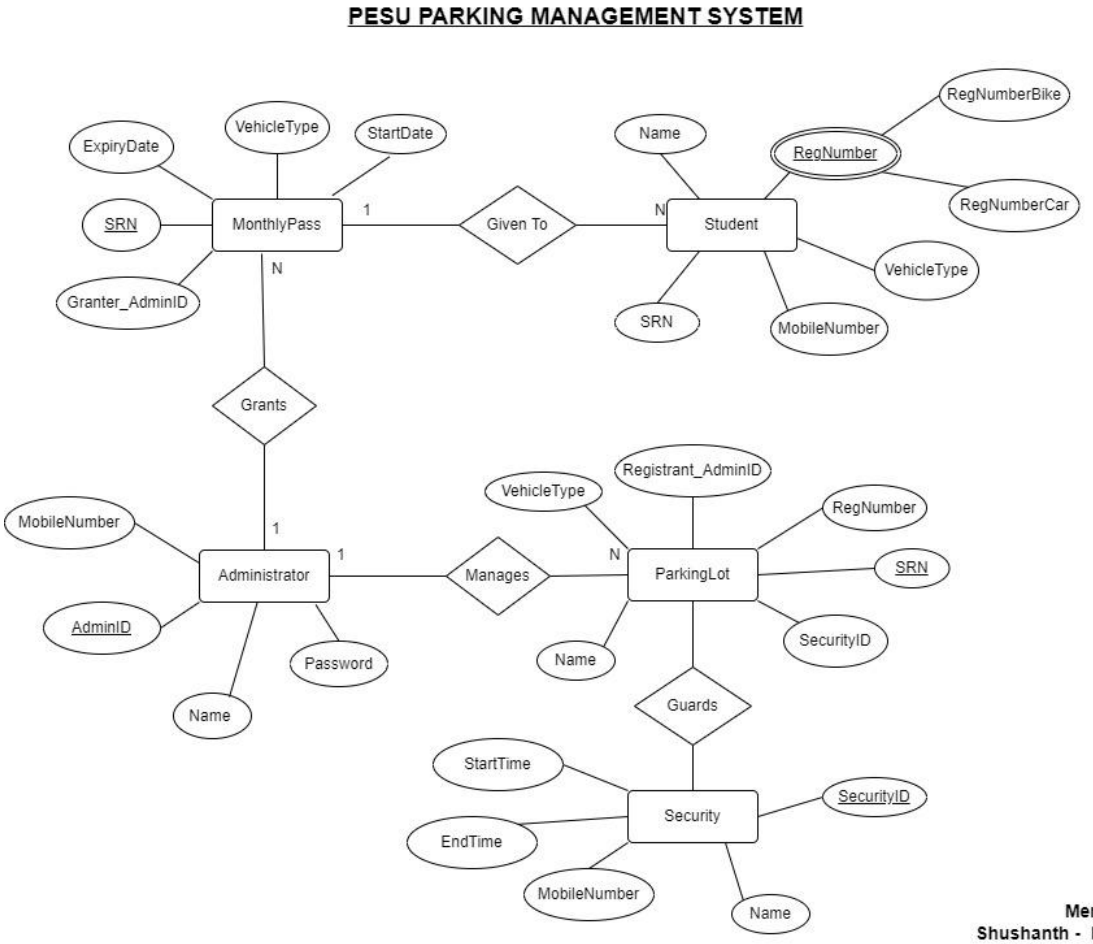
ER DIAGRAM



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Entities:

- **Student:**
  - SRN: Unique student registration number
  - Name: Student's name
  - MobileNumber: Student's mobile phone number
  - VehicleType: Type of vehicle the student owns (car or bike)
  - RegNumber: Vehicle registration number

- **MonthlyPass:**
  - StartDate: Start date of the monthly pass validity
  - ExpiryDate: Expiration date of the monthly pass validity
  - VehicleType: Type of vehicle the pass is for (car or bike)
  - GranterAdminID: Administrator ID of the administrator who granted the pass
  - SRN: Student registration number of the pass holder

- **Administrator:**
  - AdminID: Unique administrator ID
  - Name: Administrator's name
  - Password: Administrator's password
  - MobileNumber: Administrator’s mobile phone number

- **Security:**
  - SecurityID: Unique security personnel ID
  - Name: Security personnel's name
  - MobileNumber: Security personnel's mobile phone number
  - StartTime: Start time of security’s shift
  - EndTime: End time of security’s shift

- **ParkingLot:**
  - Registrant_AdminID: Administrator ID of the Administrator who checked user into the parking lot
  - RegNumber: Vehicle registration number
  - SRN: Unique student registration number
  - VehicleType: Type of vehicle user is going to park
  - SecurityID: Unique security personnel ID of the security in charge at the given time
  - Name: Name of user parking their vehicle

Relationships:

- **GivenTo:**
  - Description: A monthly pass is given to a student.
  - Participation: One monthly pass can be given to a student for 2 and 4 wheeler registrations (1:N).
  - Cardinality: A student can have zero or one monthly pass (0:1).

- **Grants:**
  - Description: An administrator grants a monthly pass.
  - Participation: One administrator can grant many monthly passes (1:N).
  - Cardinality: A monthly pass is granted by one administrator (1:1).

- **Manages:**
  - Description: An administrator manages the vehicles in a parking lot.
  - Participation: One administrator can manage many vehicles in the parking lot (1:N).
  - Cardinality: Multiple vehicles are managed by one administrator (N:1).

- **Guards:**
  - Description: A security personnel guards a parking lot.
  - Participation: One security personnel can guard one parking lot (1:1).
  - Cardinality: A parking lot is guarded by one security personnel (1:1).

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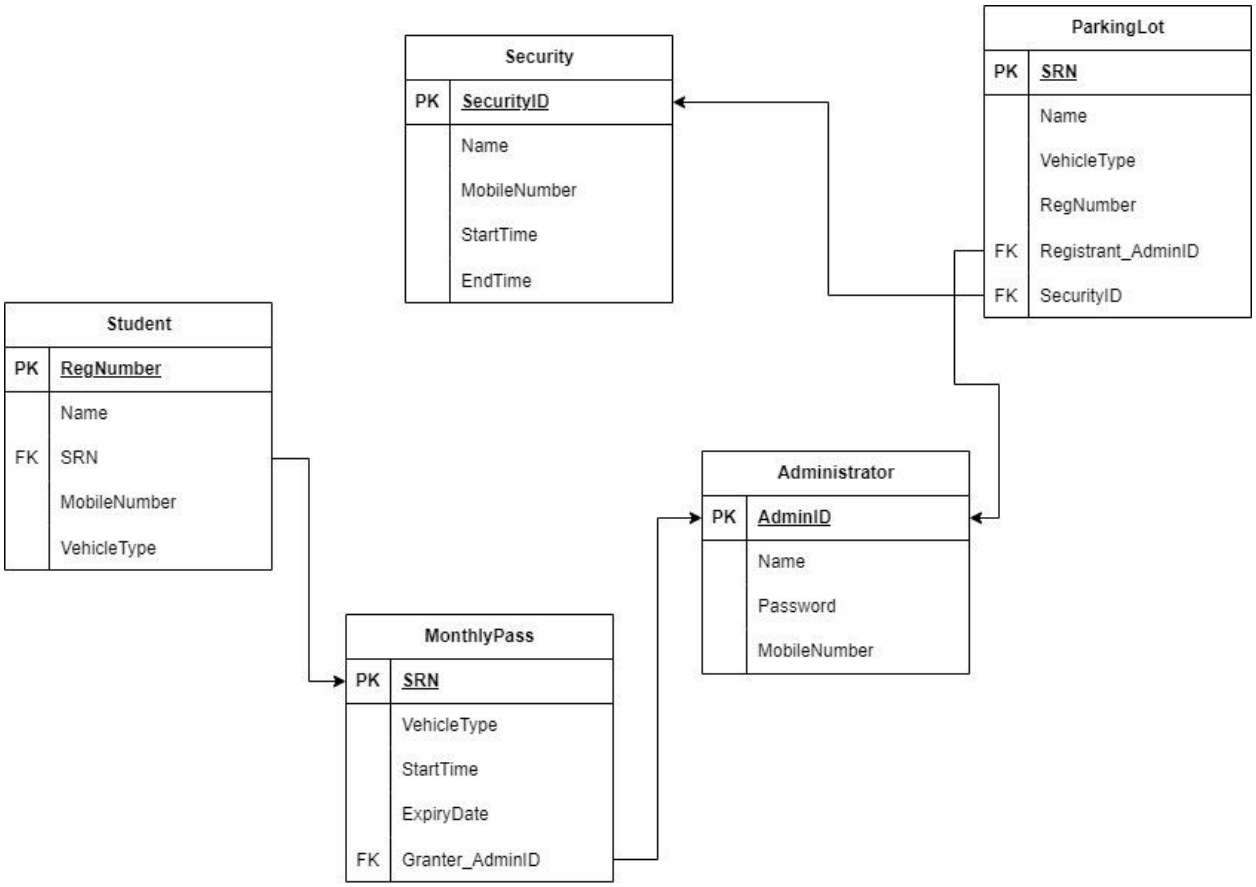
RELATIONAL SCHEMA



- The "Student" table represents information about students, including their SRN (Student Registration Number), name, mobile number, vehicle type, and vehicle registration number.
- The "MonthlyPass" table contains details about monthly passes, including their start and expiry dates, the vehicle type they are valid for, the administrator who granted the pass (identified by GranterAdminID), and the SRN of the pass holder.
- The "Administrator" table stores information about administrators, including their AdminID, name, password, and mobile number. Administrators are responsible for granting monthly passes and managing vehicles in parking lots.
- The "Security" table represents security personnel, including their SecurityID, name, mobile number, start and end times of their shifts.

- The "ParkingLot" table contains information about the parking lot, including the administrator who checked the user into the parking lot (Registrant_AdminID), the vehicle registration number, the SRN of the student parking the vehicle, the vehicle type, and the security personnel in charge at the given time (SecurityID).
- The Student table has a foreign key ‘SRN’ referencing the MonthlyPass table
- The MonthlyPass table has a foreign key Granter_AdminID referencing the Administrator table.
- The ParkingLot table references both Administrator and Security using its respective foreign keys.

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User Requirements

- **User Registration and Authentication:**

  Users (students, faculty, and staff) should be able to register and log in to the system using their college credentials (e.g., student ID or employee ID).

- **Dashboard:**

  After logging in, users should be presented with a personalized dashboard that displays relevant information, such as their current parking status, any violations or fines, and options to manage their parking account.

- **Parking Space Availability:**

  Users should be able to view real-time information about the availability of parking spaces in various campus parking lots. This information can be presented as a color-coded map or a list of parking lots with available spots.

- **Parking Lot Selection:**

  Users should have the option to select a specific parking lot or area they wish to park in based on the available spots.

- **Vehicle Registration:**

  Users should be able to register their vehicles, including license plate information, in the system. The system should associate registered vehicles with the user's account.

- **Parking Permit Display:**

  Users should have the ability to display a digital parking permit on their mobile device, which can be scanned by parking attendants for validation.

- **Parking Violation Reporting:**

  Users should be able to report parking violations or issues, such as unauthorized vehicles parked in accessible spots or blocked driveways.

- **User Profile Management:**

  Users should be able to update their personal information, add or remove registered vehicles, and review their parking history.

- **Help and Support:**

  Users should have access to a help and support section with FAQs, contact information for the parking office, and a ticket system for resolving parking-related issues.

- **Responsive Design:**

  The front-end should be responsive, ensuring it works well on a variety of devices, including smartphones, tablets, and desktop computers.

- **Accessibility:**

  Ensure that the front-end design follows accessibility guidelines to accommodate users with disabilities.

- **User-Friendly Interface:**

  The interface should be intuitive and easy to navigate, with clear and concise instructions for users.