College Parking Database Management System

DBMS mini project

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User Requirement Specification Document

College Parking Database Management System

1. Introduction
1.1 Purpose
The purpose of this document is to define the user requirements for the Parking System, which includes managing student, employee and visitor parking within the organization's parking lots.

1.2 Scope
This system will manage parking records, payments, and access control for students, employees, and visitors.

2. Users and Roles

2.1 Students
- Students should be able to register their vehicles.
- They can purchase parking passes.
- Students can view their parking history and fees.

2.2 Employees
- Employees can register their vehicles.
- Employees may purchase parking passes.
- They can view their parking history and fees

2.3 Visitors
- Visitors can register their vehicles.
- They must pay for parking.
- Visitor access to parking lots is temporary.

3. Functional Requirements

3.1 Vehicle Registration
- Users can register their vehicles (two-wheeler or four-wheeler) with vehicle details.
- Vehicle registration should include Vehicle Number and Type.

- Duplicate vehicle registration should be prevented.

3.2 Parking Records
- The system should record entry and exit times for vehicles.
- Calculate parking fees based on vehicle type and duration.
- Allow for tracking of vehicles that have not yet exited.

3.3 Employee Access
- Employees can purchase parking passes with defined types.
- Parking pass details should include expiry dates.

3.4 Visitor Parking
- Visitors must pay for parking upon entry.
- Monitor visitor access and exit times.

3.5 Parking Lot Information
- Display parking lot names, capacities, and availability.
- Provide real-time updates on parking lot availability.

3.6 Payment Transactions
- Allow for various payment methods.
- Store transaction details including amount, type and date.

4. Non-Functional Requirements

4.1 Security
- Ensure secure storage of user and transaction data.
- Authenticate and authorize users based on roles.

4.2 Performance
The system should be responsive even during peak usage.

4.3 Scalability
The system should be able to handle an increasing number of users and parking records.

4.4 Usability
The user interface should be intuitive and easy to use.

4.5 Reliability
Ensure data integrity and minimize system downtime.

5. Constraints

- The system must comply with local parking regulations.
- Integration with payment gateways for financial transactions.

6. Glossary
URS: User Requirement Specification
Two-Wheeler: A vehicle with two wheels (e.g., motorcycles).
Four-Wheeler: A vehicle with four wheels (e.g., cars).

7. Revision History
Version 1.0: Initial Release (Date)

Entities And Their Attributes

Student

- StudentID (Primary Key)
- StudentName
- PhoneNumber

Vehicle

- VehicleID (Primary Key)
- VehicleType (Two-Wheeler or Four-Wheeler)

ParkingRecord

- RecordID (Primary Key)
- {StudentID, VisitorID, EmployeeID} (Foreign Key referencing Student Table)
- VehicleID (Foreign Key referencing Vehicle Table)
- EntryTime (Timestamp)
- ExitTime (Timestamp, can be NULL until the vehicle exits)
- Amount (Foreign key referencing Transaction table)

Employee

- EmployeeID (Primary key)
- EmployeeName
- PhoneNumber
- EmployeeType

ParkingLot

- LotID (PrimaryKey)
- LotName
- Capacity
- Availability (Derived, Capacity - No of vehicles)

Transaction

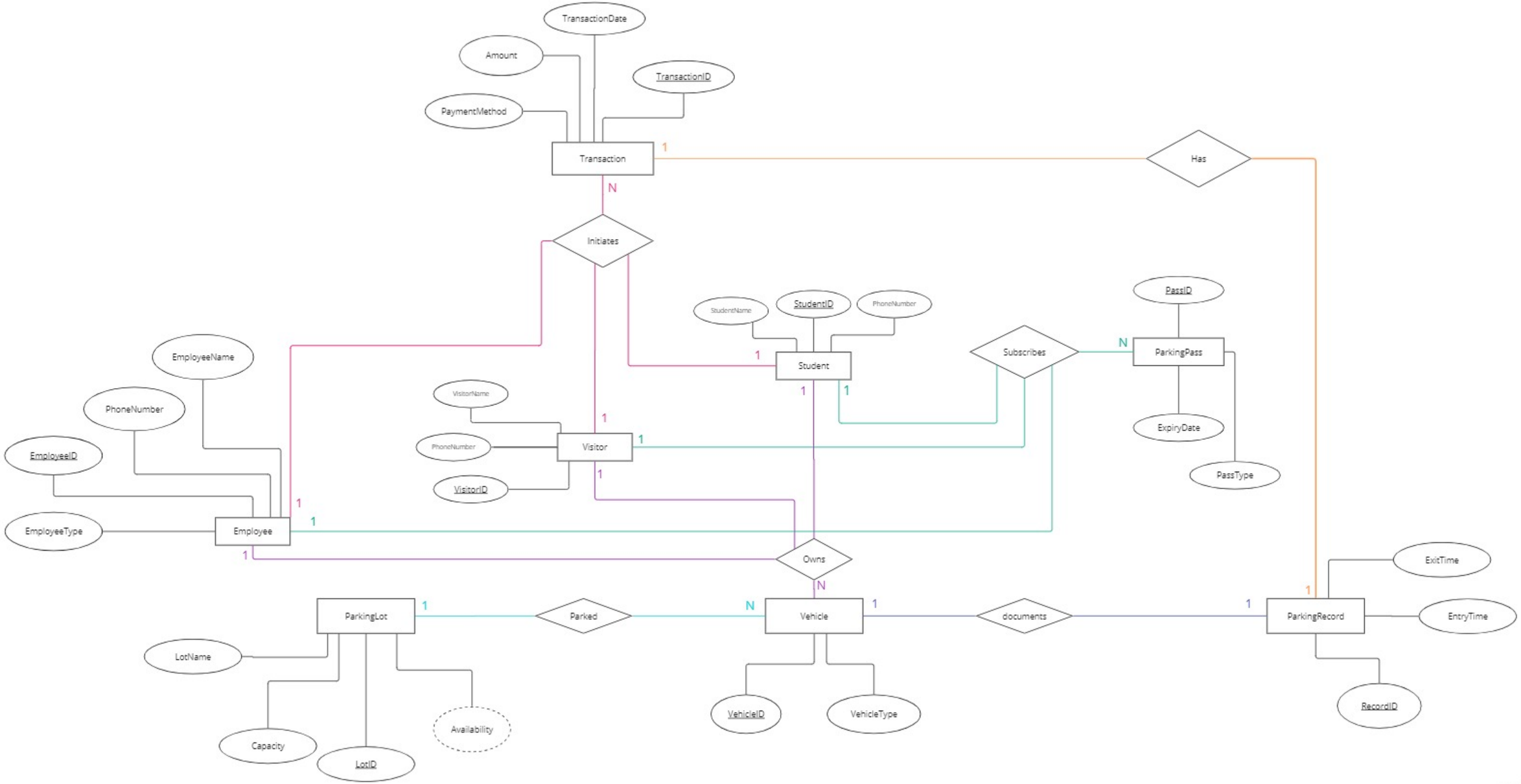
- TransactionID(Primary Key)
- {StudentID, VisitorID, EmployeeID} (Foreign Key referencing student table)
- Amount
- TransactionDate
- PaymentMethod

ParkingPass

- PassID (Primary Key)
- {StudentID, EmployeeID, VisitorID } (Foreign key referencing student and employee tables)
- PassType
- ExpiryDate

Visitor

- VisitorID(Primary Key)
- VisitorName
- PhoneNumber


TransactionDate
Amount
TransactionID
PaymentMethod
Transaction
1
Has
N
Initiates
StudentName
StudentID
PhoneNumber
PassID
Subscribes
N
ParkingPass
1
Student
1
1
EmployeeName
VisitorName
PhoneNumber
ExpiryDate
PhoneNumber
Visitor
1
1
EmployeeID
VisitorID
PassType
1
1
EmployeeType
Employee
1
Owns
N
ExitTime
1
ParkingLot
1
Parked
N
Vehicle
1
documents
1
ParkingRecord
EntryTime
LotName
VehicleID
VehicleType
RecordID
Availability
Capacity
LotID

Student Table

StudentID	StudentName	PhoneNumber

Vehicle Table

VehicleID	VehicleType

ParkingRecord Table

RecordID	StudentID	VisitorID	EmployeeID	VehicleID	EntryTime	ExitTime	Amount

Employee Table

EmployeeID	EmployeeName	PhoneNumber	EmployeeType

ParkingLot Table

LotID	LotName	Capacity	Availability

Visitor Table

VisitorID	VisitorName	PhoneNumber

Transaction Table

TransactionID	StudentID	VisitorID	EmployeeID	Amount	TransactionDate	PaymentMethod

ParkingPass Table

PassID	StudentID	EmployeeID	PassType	ExpiryDate	VisitorID