

ACCA7002 Database Systems

Tutorial 10

Tutorial 10: Car Parking Management System database in PostgreSQL

Lab Activity 10.1: Creating Tables

Objective: Create a database schema for a Car Parking Management System with tables for parking spaces, vehicles, and transactions.

- Create a table named `parking_spaces` with columns:
`space_id` (integer, primary key)
`location` (varchar)
`occupied` (boolean)

- Create a table named `vehicles` with columns:
`vehicle_id` (integer, primary key)
`plate_number` (varchar)
`owner_name` (varchar)
`phone_number` (varchar)

- Create a table named `transactions` with columns:
`transaction_id` (integer, primary key)
`vehicle_id` (integer, foreign key referencing `vehicles`)
`space_id` (integer, foreign key referencing `parking_spaces`)
`entry_time` (timestamp)
`exit_time` (timestamp)

Lab Activity 10.2: Inserting Values

Objective: Insert sample data into the tables.

- Insert at least five parking spaces with different locations.
- Insert at least three vehicles with different plate numbers.
- Insert transactions for vehicles entering and exiting the parking lot.

Lab Activity 10.3: Updating Values

Objective: Update records in the tables.

- Update the status of a specific parking space to indicate it is occupied.
- Update the owner's phone number for a specific vehicle.

Lab Activity 10.4: Performing Transactions

Objective: Use transactions to handle vehicle entry and exit.

- Begin a transaction for a vehicle entering the parking lot.
- Insert a new transaction record for the vehicle entering.
- Update the status of the corresponding parking space to occupied.
- Commit the transaction if all operations are successful; otherwise, rollback.

Lab Activity 10.5: Creating Index

Objective: Improve query performance by creating an index.

- Create an index on the plate_number column in the vehicles table.

Lab Activity 10.6: Joins

Objective: Practice different types of joins for reporting purposes.

- Perform a query to get a list of all parking spaces and their occupancy status.
- Perform an inner join to get a list of transactions with vehicle and parking space information.
- Perform a left join to get a list of all vehicles and their transaction details (if any).
- Perform a right join to get a list of all transactions and the corresponding vehicle details (if any).