**Cisco’s Dumpster Services**



Final Project Report

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Abstract

Cisco’s Dumpster Services is a business a coworker recently started. I prepared their website and have previously worked at a company that provided Roll-Off Dumpsters. I decided to use the same business for database creation. Cisco’s specializes in Roll-Off Dumpsters and Junk Removal services. This database will only be for the Roll-Off segment of the business. Roll-Dumpsters are open top metal boxes measuring in cubic yards. They open from swing gates located at the back of the box. They are commonly seen and used on constructions sites to dispose of construction materials. They can also be used residentially for home cleaning and smaller projects.

Entity Relationship Narrative

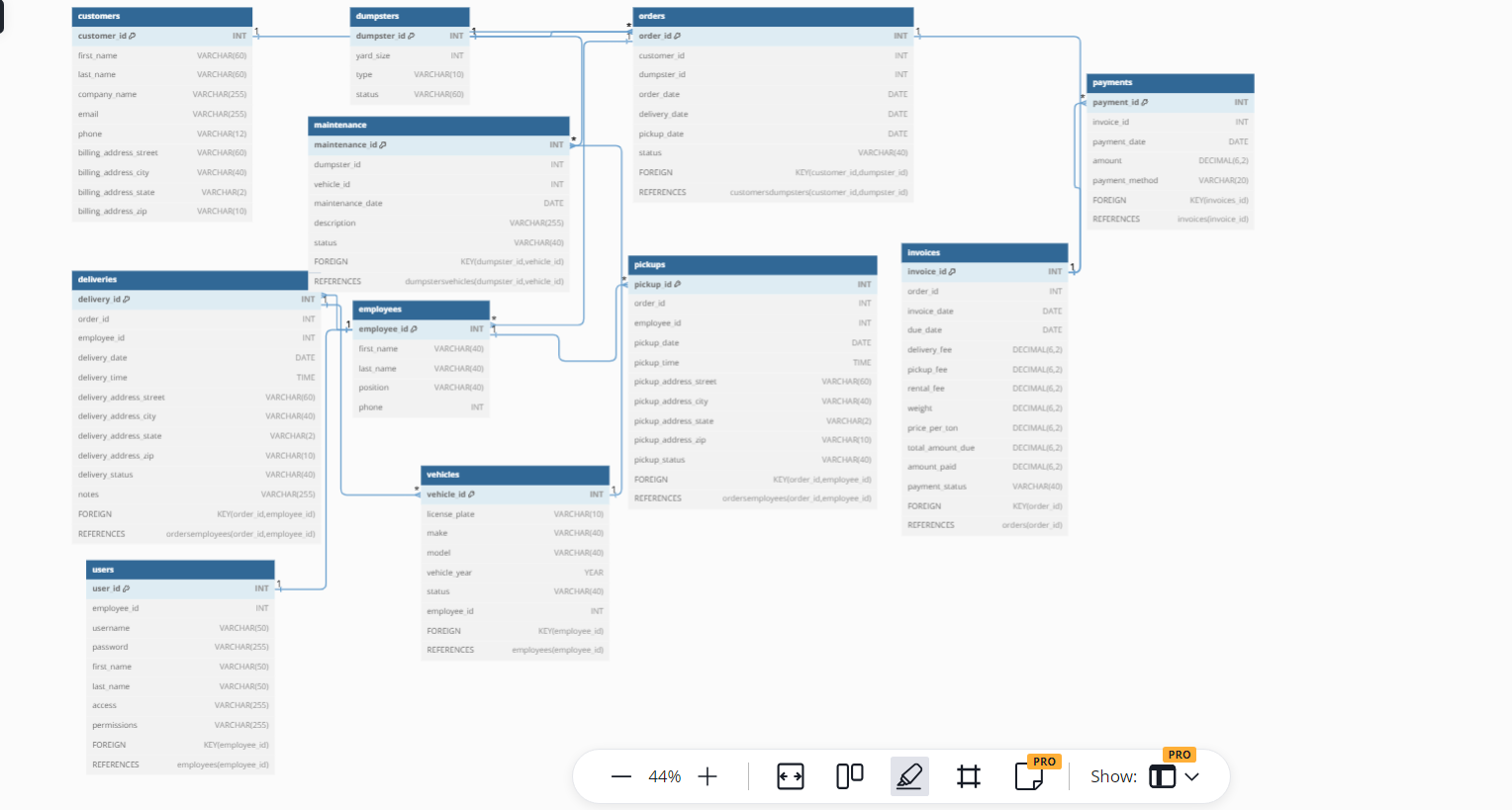
The database will include the following tables.

* Customers
* Dumpsters
* Orders
* Employees
* Deliveries
* Pickups
* Invoices
* Maintenance
* Vehicles
* Payments
* Users

Relationships between entities are as follows:

* Customers and Orders: One customer < Many orders.
* Orders and Dumpsters: Many orders > One dumpster.
* Orders and Employees: Many deliveries and pickups orders > One employee
* Orders and Invoices: One order - One invoice.
* Invoices and Payments: One invoice > Many payments.
* Dumpsters and Maintenance: One dumpster < Many Maintenance records.
* Vehicles and Maintenance: One vehicle > Many Maintenance records.

Entity Relationship Diagram



[Untitled - dbdiagram.io](https://dbdiagram.io/d/66a406c08b4bb5230e79ab28)

Business Requirements

**1. Customer Management**

* Each customer must have a unique email address.
* Customer information must include at least one contact phone number.

**2. Dumpster Management**

* Each dumpster must have a unique identifier.
* A dumpster can only have one status at a time (e.g., available, in use, under maintenance).
* Dumpsters must be inspected and maintained periodically (e.g., every 6 months).

**3. Order Management**

* An order must be linked to a customer and a dumpster.
* An order can have different statuses: pending, confirmed, delivered, picked up, or canceled.
* A dumpster must be marked as "in use" once it is linked to a confirmed order and "available" once the pickup is completed.
* Orders must include delivery and pickup dates, which cannot be the same day.

**4. Employee Management**

* Each employee must have a unique email address.
* Employees assigned to deliveries or pickups must have valid driving licenses if they are responsible for driving vehicles.

**5. Delivery and Pickup Management**

* Each delivery and pickup must be linked to an order and an employee.
* Deliveries and pickups must have scheduled dates and times.
* The status of deliveries and pickups can be scheduled, en route, or completed.

**6. Invoice and Payment Management**

* Each order generates one invoice, which must include delivery fee, pickup fee, rental fee, total weight, and the total cost and due date.
* An invoice can have multiple payments associated with it.
* Payments must include the date, amount, and payment method.
* An invoice's status can be unpaid, partially paid, or paid.

**7. Maintenance Management**

* Each maintenance record must be linked to a dumpster or vehicle and include a description and status (scheduled or completed).
* Dumpsters under maintenance cannot be assigned to new orders.

**8. Vehicle Management**

* Each vehicle must have a unique license plate.
* Vehicles must be regularly maintained and inspected.
* In use vehicles must have a employee number entered
* The status of vehicles can be available, in use, or under maintenance.

**9. Data Integrity and Consistency**

* All foreign key relationships must maintain referential integrity (e.g., orders must reference valid customers and dumpsters).
* Data consistency checks must ensure that the status of dumpsters, vehicles, and orders are updated appropriately as actions are completed.

**10. Operational Constraints**

* Delivery and pickup operations cannot be scheduled for the same time slot for the same vehicle or employee.
* Orders must be reviewed and approved by a manager before confirmation.
* Discounts or special rates must be approved by an authorized employee before being applied to an invoice.

Database Normalization

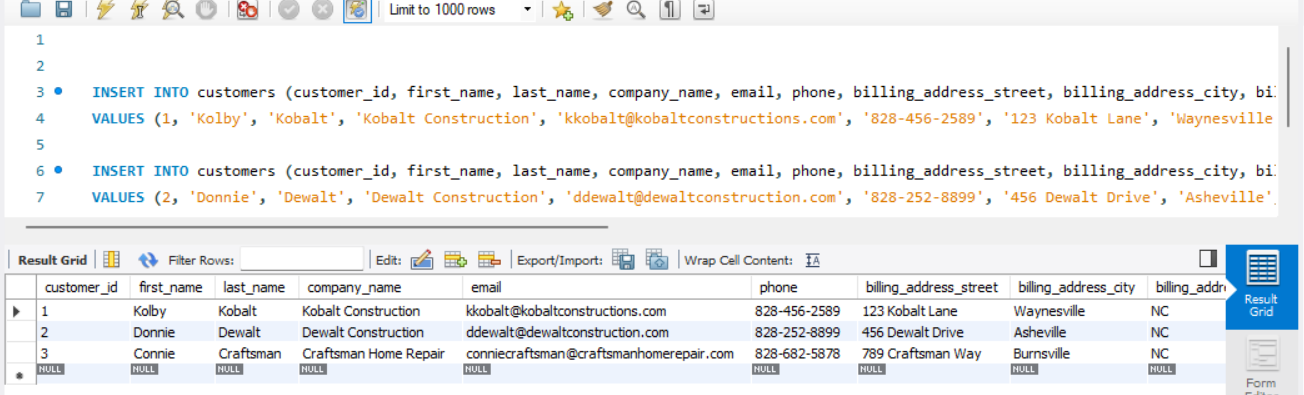
My database design conforms to 1NF, 2NF and 3NF by giving each entity its own primary key and by having all non-key attributes dependent on the primary key. Also, breaking down data such as address’s into single cells. I Gave each entity a numeric primary key to reduce redundancy. It completes 3NF by having all foreign keys and constraints referencing primary keys with no transitive dependencies.

Install/Setup Scripts

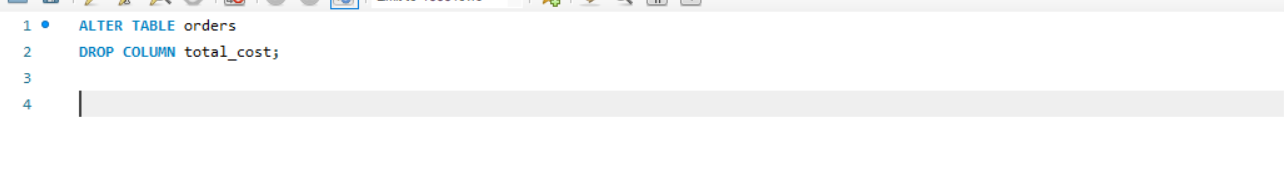
Installation script in file ciscos.sql

I used MySQL to insert data into each table instead of in the setup script.

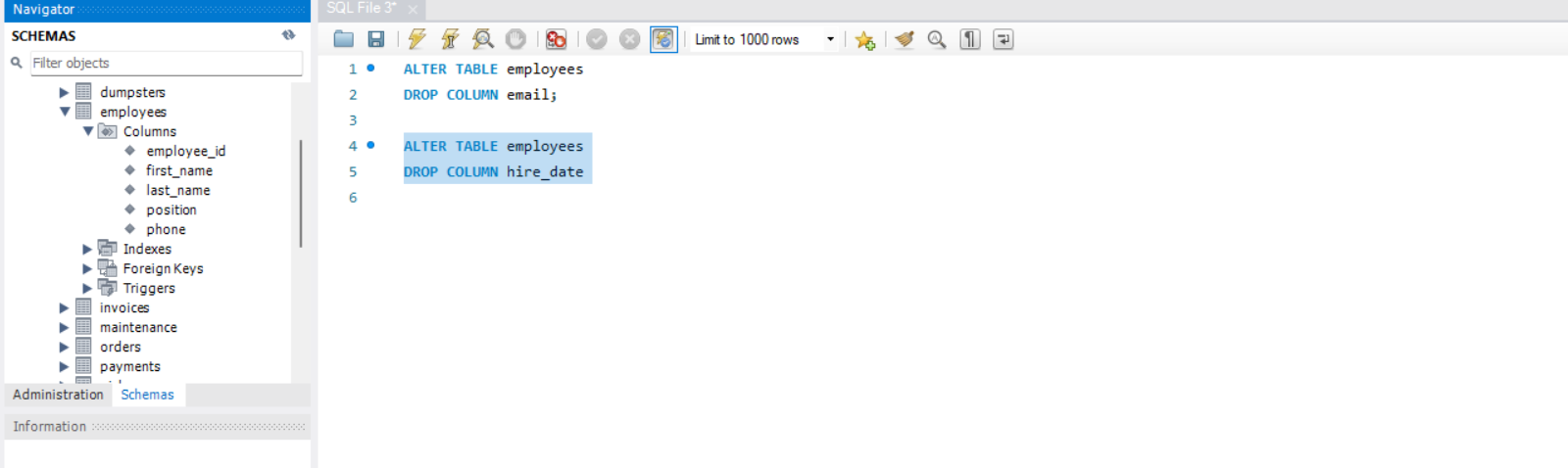
Screenshot of customers table.



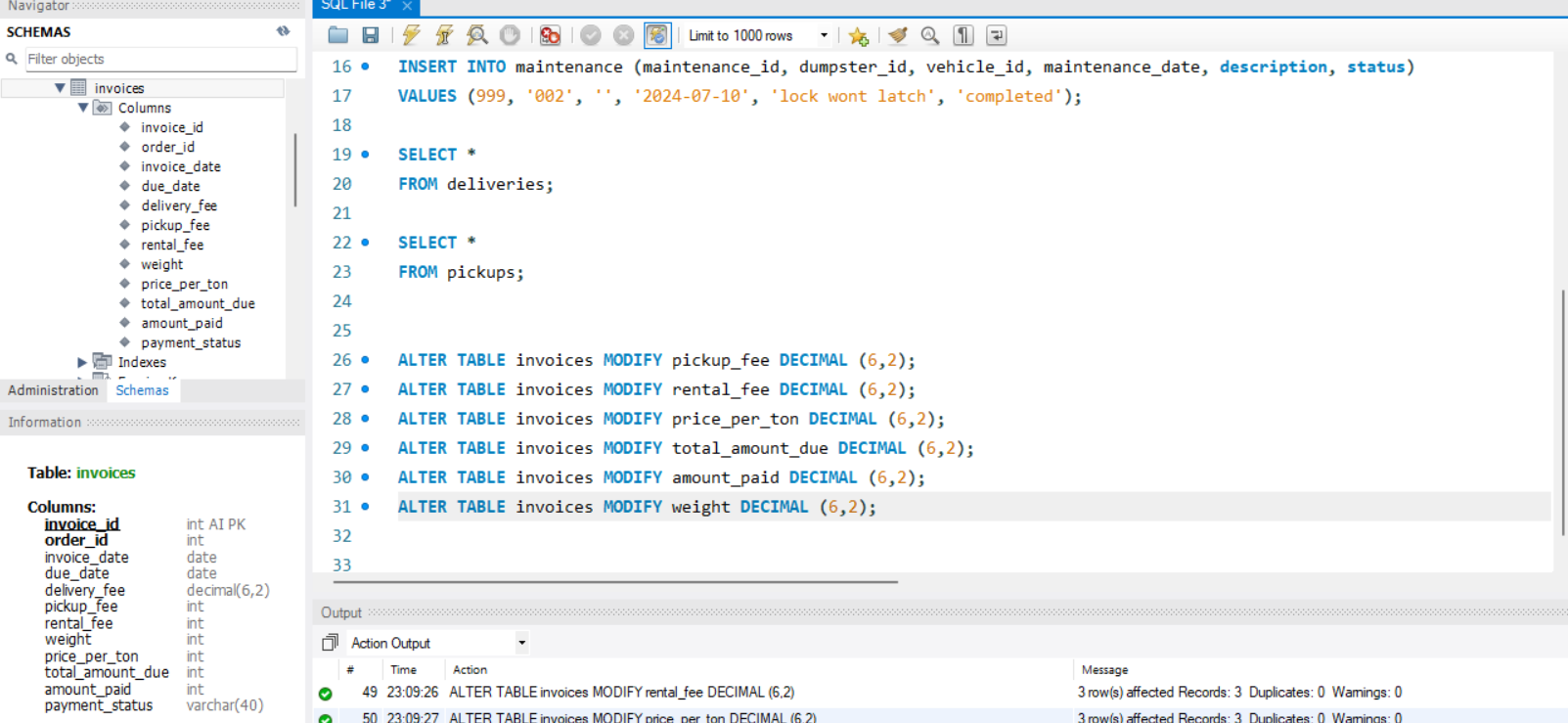
When inserting data, I decided I didn’t want the total cost column in orders anymore.



Also decided to drop email and hire date from employees table. Those would fit better in an employee table in a payroll database.



When inserting data in the invoices table, I realized I had the wrong data type.

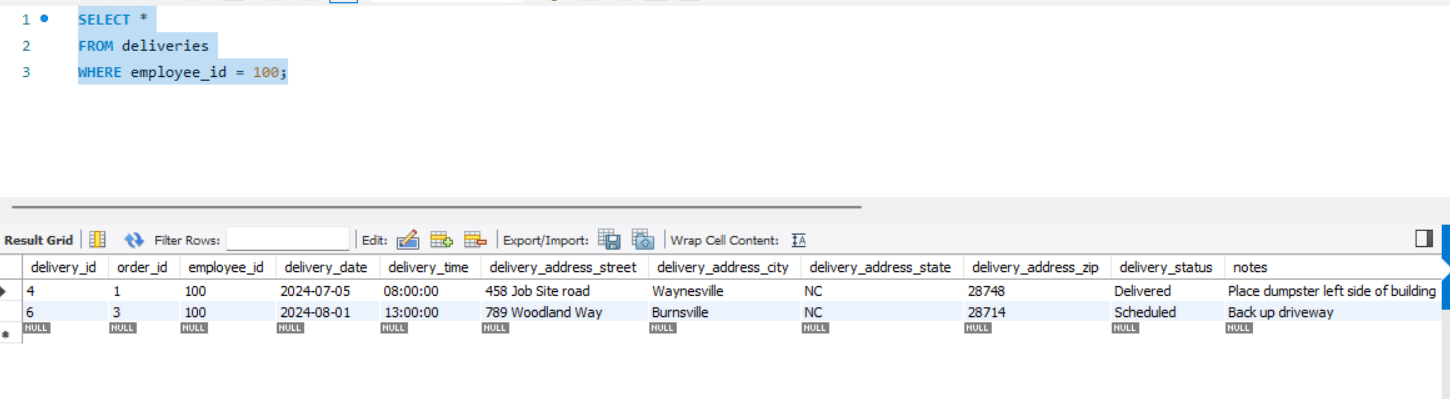


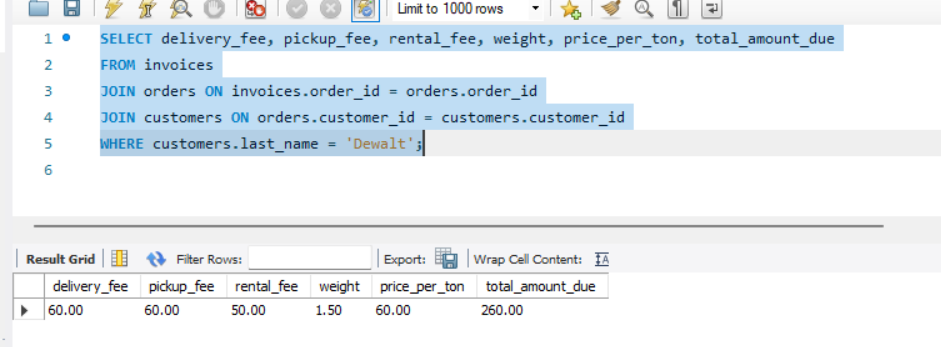
Test and Sample Queries

Data retrieval:

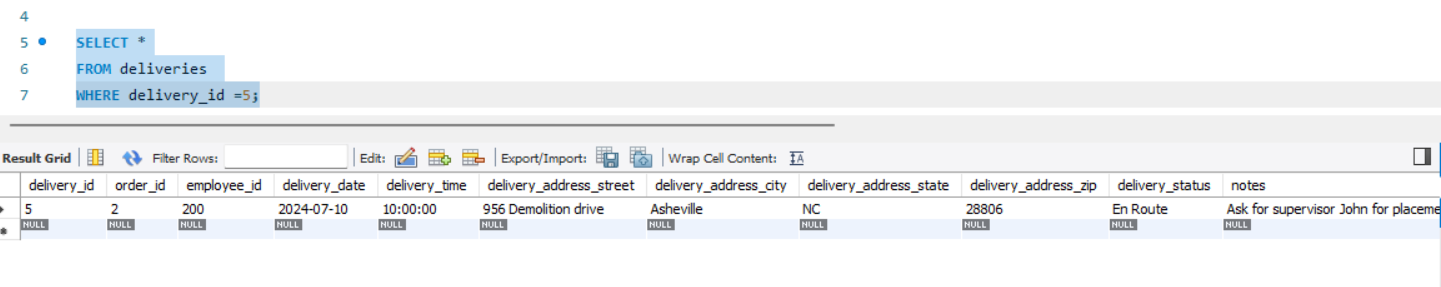
A screenshot of a computer

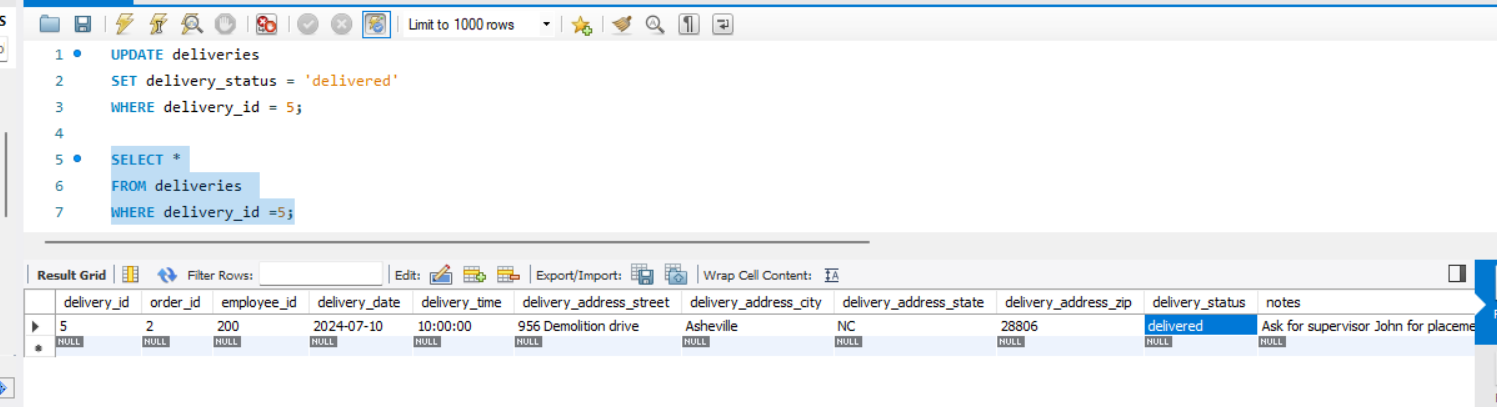
Description automatically generated



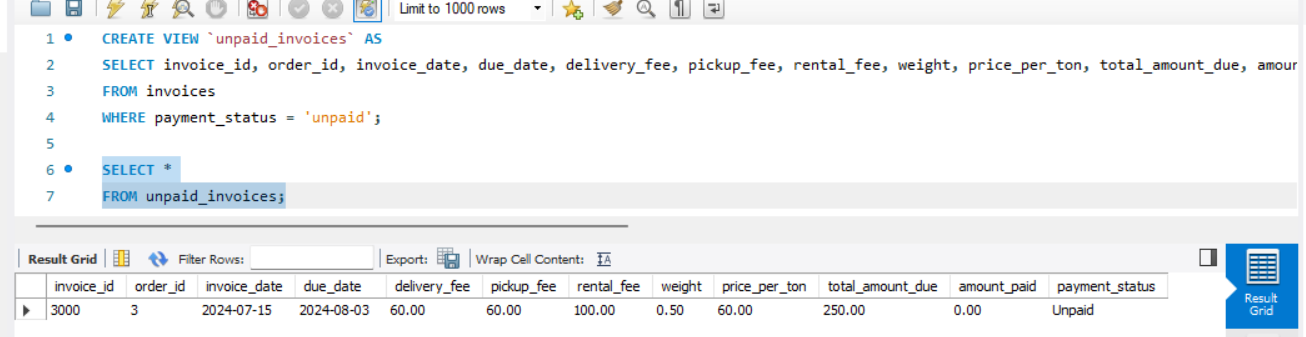


Updates:





View:



Procedure:

A screenshot of a computer

Description automatically generated

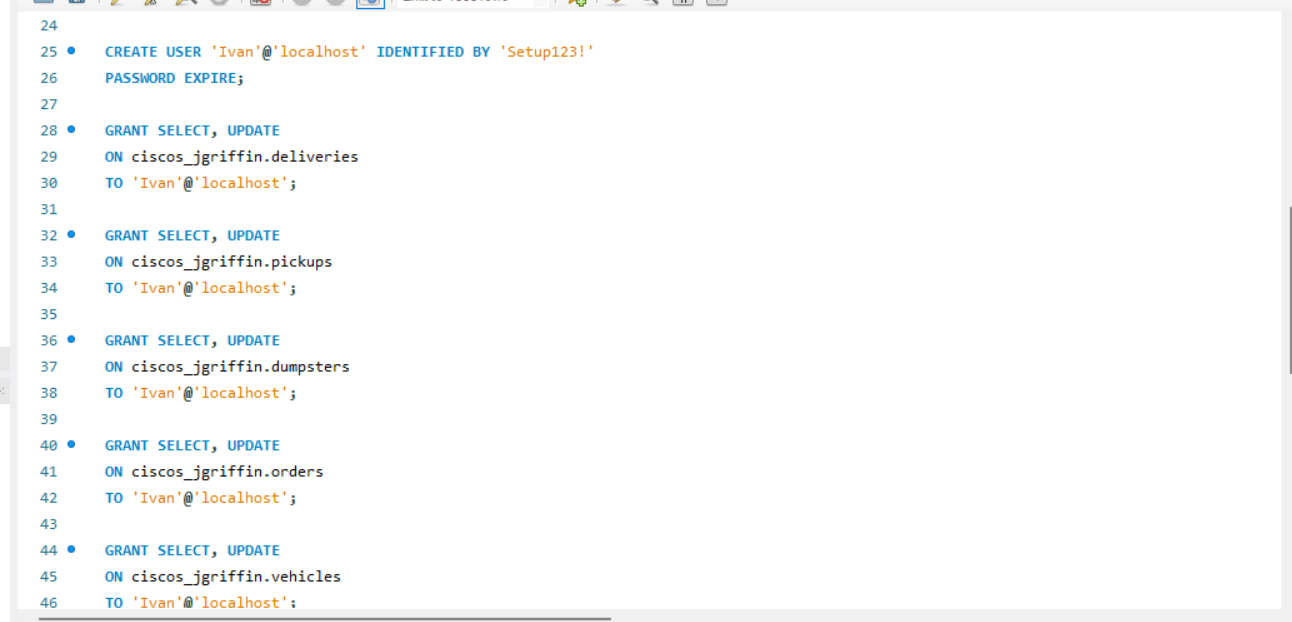
Users:

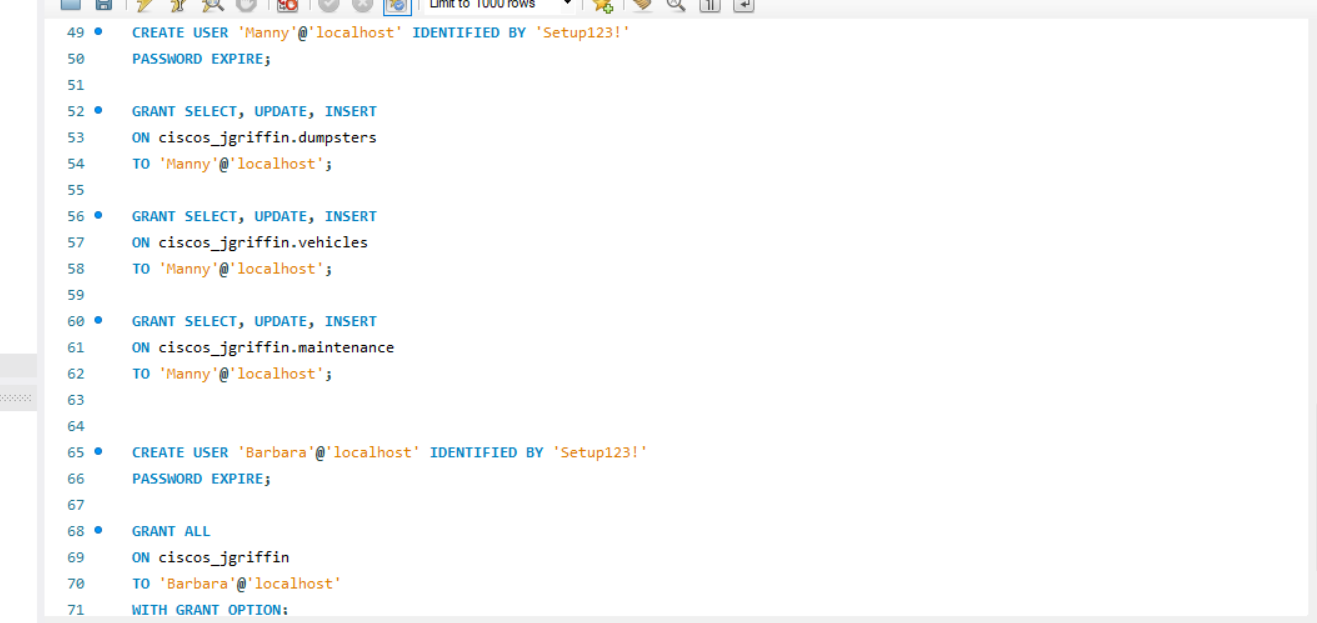
A screenshot of a computer

Description automatically generated

A screenshot of a computer

Description automatically generated





I only gave SELECT and UPDATE privileges to employees Fred and Ivan for the tables: deliveries, pickups, dumpsters, and vehicles. These tables are the only necessary ones for them to complete their work.

I gave SELECT, UPDATE and INSERT privileges to Manny as he needs to be able to insert maintenance work orders for dumpsters, and vehicles.

I gave Brabara full access as she is the office manager and will handle the day-to-day activities and order taking.

I also set all users passwords to expire so that they can create their own passwords.

Backup & Server Monitoring Strategy

After doing some research a database of this type for a small business would only have ~200 mb’s of data in total. I researched the various costs for cloud storage and compiled the following strategy.

This database will have weekly local full backups using MySQL Dump at midnight on Saturdays. Scheduled automatically. I want the backups to be on Saturdays in case there is an issue with the backup there is a day to troubleshoot before business opens on Mondays.

It will have Incremental backups every day at midnight Sundays through Fridays.

There will also be full back ups to the cloud via AWS. They provide RDS/SSD storage for free up to 20Gb each per month for 1 year, and monitoring tools for managing backups/servers.

Daily backups will be retained until after the following weeks full backup has been performed.

Weekly backups will be retained for one month.

[phpMyAdmin](http://172.210.59.62/phpmyadmin/index.php)

Username: ray

Password: P@$$W0rd!