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Requirements Document for Herbie's Auto Shop

This document covers the requested requirements for our application to be used by Herbie's Auto Shop, which were provided by the owner of said auto shop.

Main purpose:

To store and track information on customers of the auto shop, their cars, their invoices detailing the work being done, the parts required for service, the suppliers who provide these parts, and the employees of the shop.

Required features:

- Navigate through pages to create and view customers, cars, invoices, parts, suppliers, and employees.
- Customer information consists of customer ID, first/last name, phone number, address, and date added to system.
- Car information consists of VIN, make, model, year, customer ID associated with it, license plate, and state.
- Invoices are made to store information such as cost of labor, license plate, customer ID, employee ID, work being done, description of problem, engine code, invoice date, and total cost.
- Part information has part ID, name, cost, number in inventory, and supplier.
- Supplier information includes name, address, phone number, and email.
- Employee information includes employee ID, first/last name, and hourly wages.

- Users (employees) are able to create, view and edit records but only administrators (owners/managers) have permission to delete records and create users.
 - This is to be done by signing up users, storing their information so that they can log onto the website in the future.
- The website is to be styled appropriately and professionally, and easy to use.
- Search feature for customers that allow easy lookup to view work being done on their cars.

Constraints:

The primary keys of the tables are as follows:

CARS: license_plate

CUSTOMERS: cust_id

INVOICES: inv_id

SUPPLIERS: supp_id

PARTS: part_id

EMPLOYEES: emp_id

INCLUDED_PARTS: part_id, inv_id

Foreign keys:

CARS: cust_id from customers because each car is owned by a customer

PARTS: supp_id from suppliers because each part comes from a supplier

INVOICES: emp_id from employees because each car problem is assigned to an employee, cust_id from customers because each invoice belongs to a customer, and car_id from cars because each invoice involves a car

INCLUDED_PARTS: part_id from parts, inv_id from invoices (this table keeps track of which parts are included on each invoice, thus removing the M:N issue between parts and invoices).

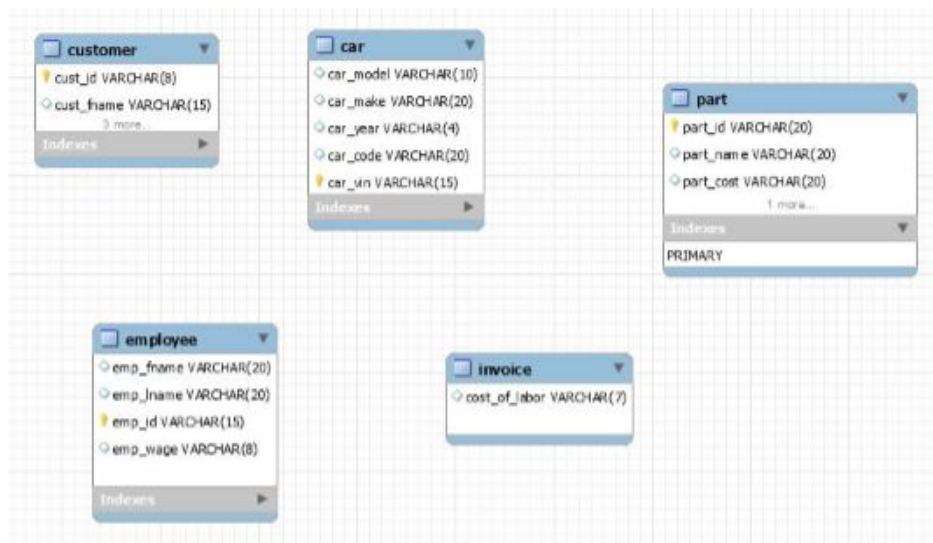
Check constraints:

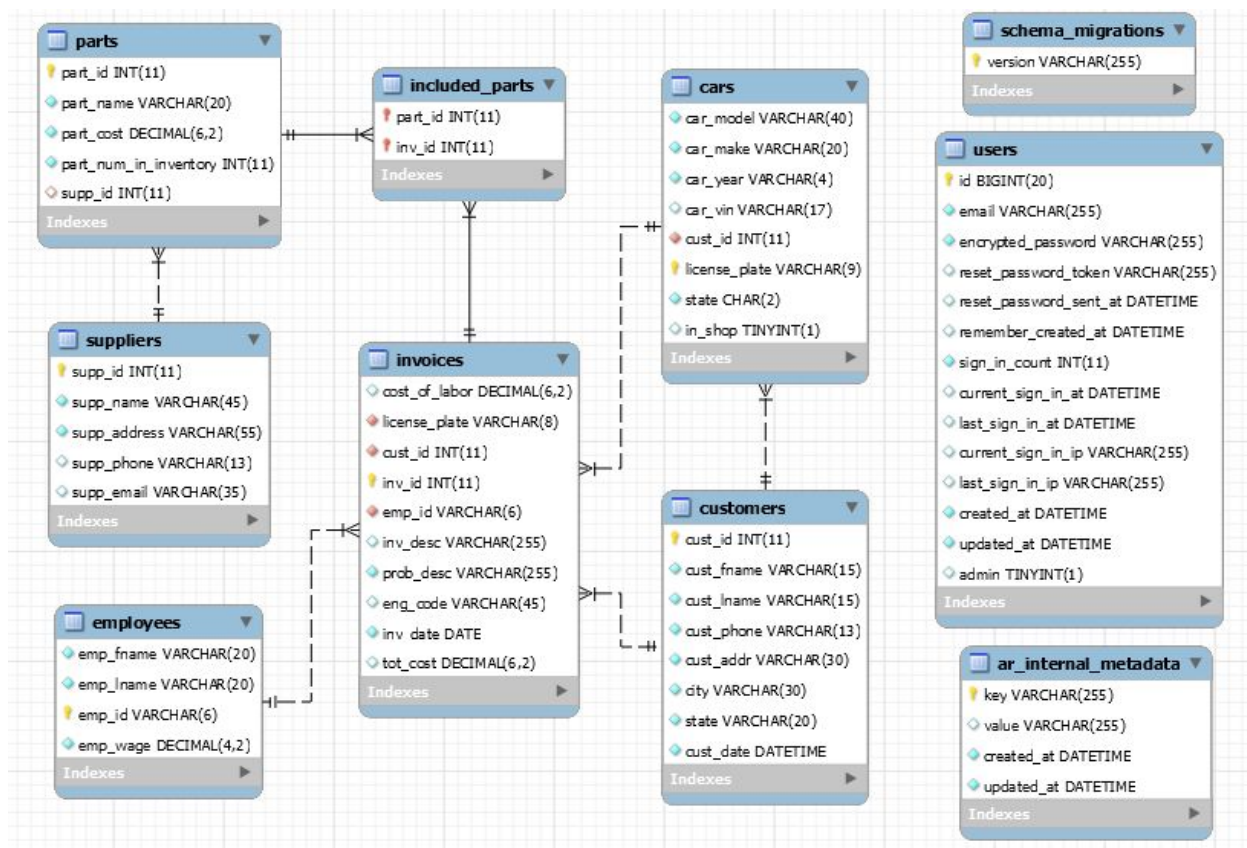
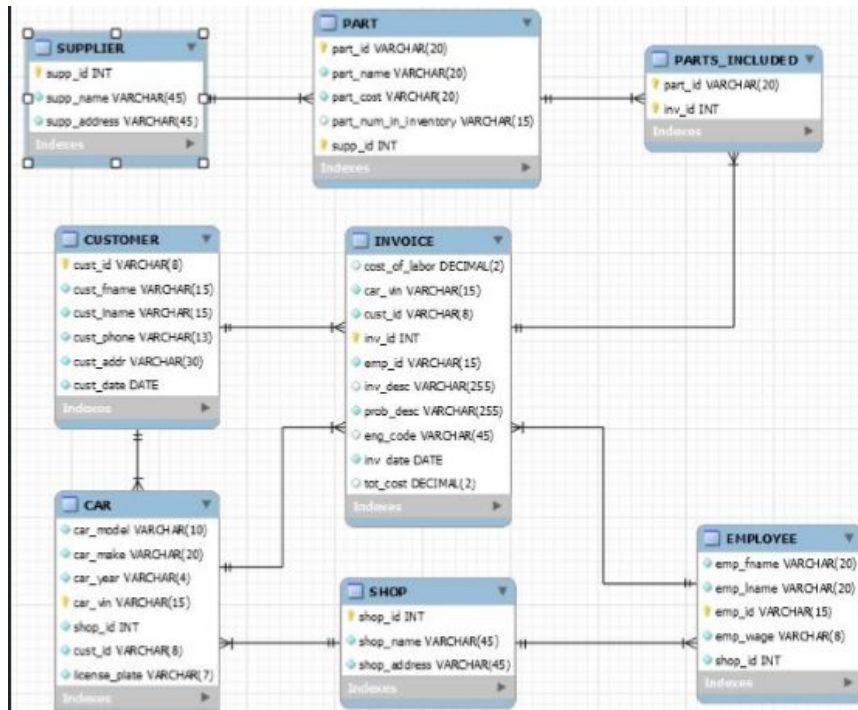
We didn't go over these, so we didn't implement any

Not null constraints:

Originally, we created our database for use in a perfect world. When it came time to implement it, we realized that some of our original design was not very realistic (such as customers knowing their VINs). We removed some of our original not null constraints on things like VIN, phone number and email address for suppliers, and engine code for invoices.

DB progress (continued on next page):





By the time we had our tables decided on, the normalization process ended up being a check because we had already done a lot of it without realizing it. We checked that the tables were in first normal form by making sure that all attributes in each table were dependent on the primary key for that table and that there were no repeating groups. Then we checked for second normal form by making sure there were no partial dependencies (only in the included_parts table was that even possible). Finally, we checked for BCNF (a special form of third normal form) by assuring that each table contained no transitive dependencies and that every determinant in the tables was a candidate key.