

Relational Schema

Truck = (plate_number, capacity, fuel, route_followed [fk15])

fk15: route_followed -> route(routeID)

Order = (orderID, price, customer_identifier [fk12])

fk12: customer_identifier -> Customer(username)

Route: (routeID)

Warehouse = (warehouse_ID, x_coordinate, y_coordinate)

Leg = (legID, distance, departure [fk13], arrival [fk14])

fk13: departure -> warehouse(warehouse_ID)

fk14: arrival -> warehouse(warehouse_ID)

Package = (package_number, description, packer_identifier [fk9], source [fk10], destination [fk11], order_identifier [fk19], truck_identifier [fk22])

fk9: packer_identifier -> packer(packerID)

fk10: source -> warehouse(warehouse_ID) & Fk11: destination -> warehouse(warehouse_ID)

fk19: order_identifier -> order(orderID)

fk22: truck_identifier -> truck(plate_number)

User = (username, first_name, last_name, birthdate)

Customer = (username [fk1], phone_number, address)

fk1: username -> User(username)

Contractor = (username [fk2], company, shift_start_time, shift_end_time, packer_identifier [fk7], shift_start, shift_end)

fk2: username -> User(username)

fk7 : packer_identifier -> packer(packerID)

Employee = (taxID, username [fk3], salary)

fk3: username -> User(username)

Driver = (taxID [fk4], experience, plate_no [fk16])

fk4: taxID -> employee(taxID)

fk16: plate_no -> truck(plate_number)

Warehouse_worker = (taxID [fk5], warehouse_identifier [fk6], packer_identifier [fk8], shift_start, shift_end)

fk5: taxID -> employee(taxID)

fk6: warehouse_identifier -> warehouse(warehouse_ID)

fk8: packer_identifier -> packer(packerID)

Packer = (packerID, shift_start, shift_end)

Contains = (sequence, route_identifier [fk20], leg_identifier [fk21])

fk20: route_identifier -> route(routeID)

fk21: leg_identifier -> leg(legID)

Unhandled Constraints

Ensure that there is at least one of each user role.

Ensure that the username starts with the first letter of the user's first name, full last name, and ends with a digit, and is all in lowercase.

Ensure that the first and last name are not null.

Ensure that the address is a valid street number and name.

Ensure that the phone number consists of 10 characters that are all natural numbers or 0.

Ensure that an employee is not also an independent contractor.

Ensure that each customer has a unique contact number.

Ensure that the order ID is a combination of capital letters and natural numbers or 0.

Ensure that the role of each employee is maintained.

Ensure that each employee only has one role.

Ensure that the non-hyphenated characters in the tax-identifier are natural numbers or 0.

Ensure that if a user is a contractor, the company is not null.

Ensure that the start time of a packer is before the end time.

Ensure that the warehouse ID is a three character abbreviation of a valid location.

Ensure that the x and y coordinates range from -180 to 180 degrees.

Ensure that the source and destination warehouses are not the same.

Ensure that the packer ID is a natural number or 0.

Ensure that the driver is assigned a truck after they have 2 months of experience.

Ensure that the plate number is a combination of capital letters and natural numbers or 0.

Ensure that the capacity of a truck does not exceed 100 tons.

Ensure that the fuel of a truck does not exceed 300 gallons.

Ensure that the legs are consecutive.

Ensure that the distance of a leg is not 0.

Ensure that arrival and departure are not the same.

Ensure that no two routes have the exact same sequence.

Ensure that the total distance of a route is greater than or equal to the distance of any of its legs.

Ensure that the leg ID is in the format “leg_” and then a natural number or 0.