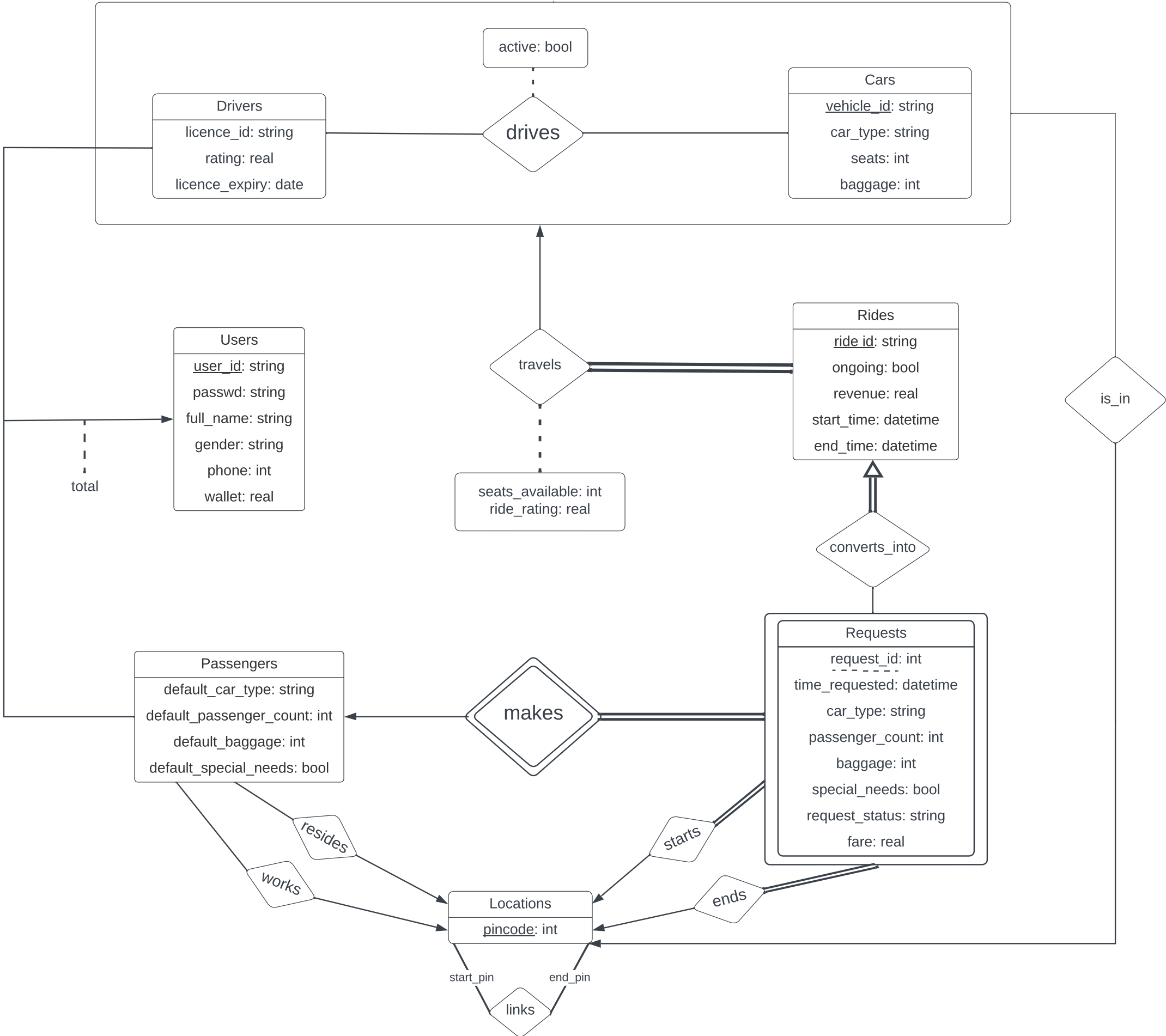


Car Pooling Management System ER Model

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Real World Constraints:

General Assumptions:

- > Cars are "owned" by our Carpooling Company: drivers register with us and can be associated with multiple of our cars.
- > If a car is out of service, another car can be driven by the driver.
- > If a driver is unavailable, another driver can drive the cars previously driven by that driver.
- > Once a ride begins, it's assumed to be completed without any issues mid-way.

Constraints NOT Expressed by the ER Diagram:

Drives:

- > Only one driver-car pair (d,c) can have active = true among all possible driver-car pairs which has either the driver d or the car c.
- > All driver-car pairs with active = true must participate in **is_in** with Locations
- > Driver-car pairs with active = false must not participate in **is_in** with Locations
- > Driver-car pair can have active = true only if the driver's licence isn't expired

Rides:

- > If a Ride has ongoing = true, then the driver-car pair it is associated with in **travels** must have active = true
- > Two Rides with overlapping durations can't be associated with same driver-car pair in **travels**
- > In a Ride, start_time < end_time

Requests:

- > To avoid unending rides, drivers can only accept Requests whose requested_time is less than Ride's start_time + 4 hours
- > If a request_status is "Accepted" for a Passenger, then they can't create another Request until the current request_status is "Completed"
- > start_location and end_location for Requests can not be the same

Converts_Into:

- > Only Requests which have request_status as "Accepted", "Completed" will participate in the **converts_into** relationship
- > Requests having request_status = "Requested", "Approved", "Failed" can't participate in the **converts_into** relationship
- > Only Rides with ongoing = false can be associated with Requests having request_status of "Completed"

Links:

- > The two participating Locations (start_pin and end_pin) can not be the same

Other Constraints on Attributes:

Drivers:

- > Candidate Key: licence_id
- > licence_id: fixed length - 9 characters
- > rating: 0 to 5 real number

Cars:

- > vehicle_id: format - "[3 upper case letters] - [4 digits]"
- > car_type: "Mini", "Sedan", or "SUV"
- > seats: 3 for "Mini", 4 for "Sedan", 6 for "SUV"
- > baggage: 2 for "Mini", 3 for "Sedan", 4 for "SUV"

Requests:

- > requested_time <= Current database server time
- > passenger_count: upper bounded by car type's seats (1 by default). If no preference for car_type, then <= 6.
- > baggage_count: upper bounded by car type's baggage (0 by default). If no preference for car_type, then <= 4.
- > request_status: "Requested", "Approved", "Accepted", "Failed", "Completed". The only possible flow of values is:
 - Initially -> Requested
 - If Driver approves -> Approved, else -> Failed
 - If User pays -> Accepted else -> Failed
 - If Ride completes -> Completed

- > fare: >0 dollars, counts up to cents.

Rides:

- > start_time <= Current database server time
- > revenue > 0 dollars, stores up to cents

Users:

- > user_id: Minimum 6 characters
- > passwd: Minimum 8 characters
- > full_name: Only alphabets
- > gender: "Male", "Female", "Non-Binary"
- > phone: 10 digits
- > wallet: >=0 dollars, stores upto cents

Passengers:

- > default_car_type: can only be either "Mini", "Sedan" or "SUV" or none of the above.
- > default_passenger_count: 1 by default
- > default_baggage: 0 by default
- > default_special_needs: false by default

Travels:

- > seats_available: upper bounded by the car_type of car involved in the Ride.
- > ride_rating: 0 to 5 (default is driver's current rating at the start of the ride)