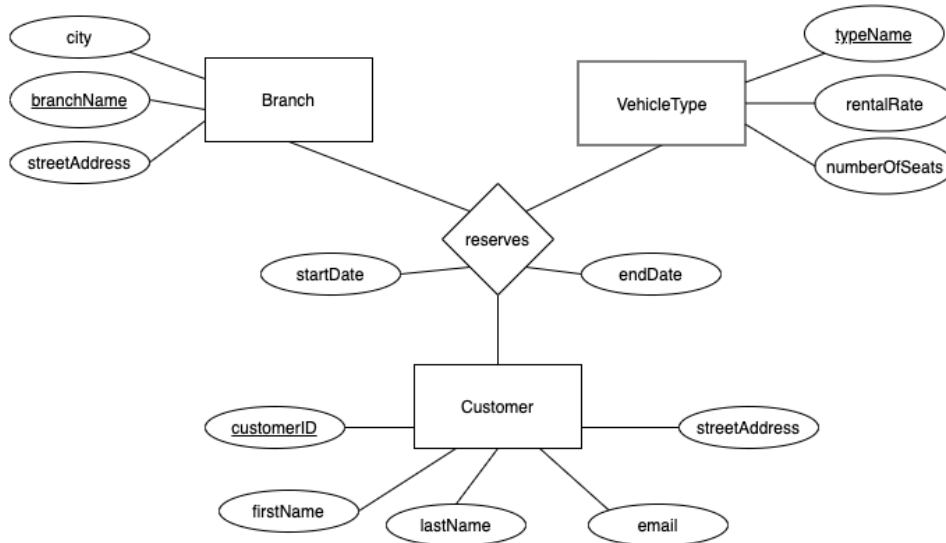


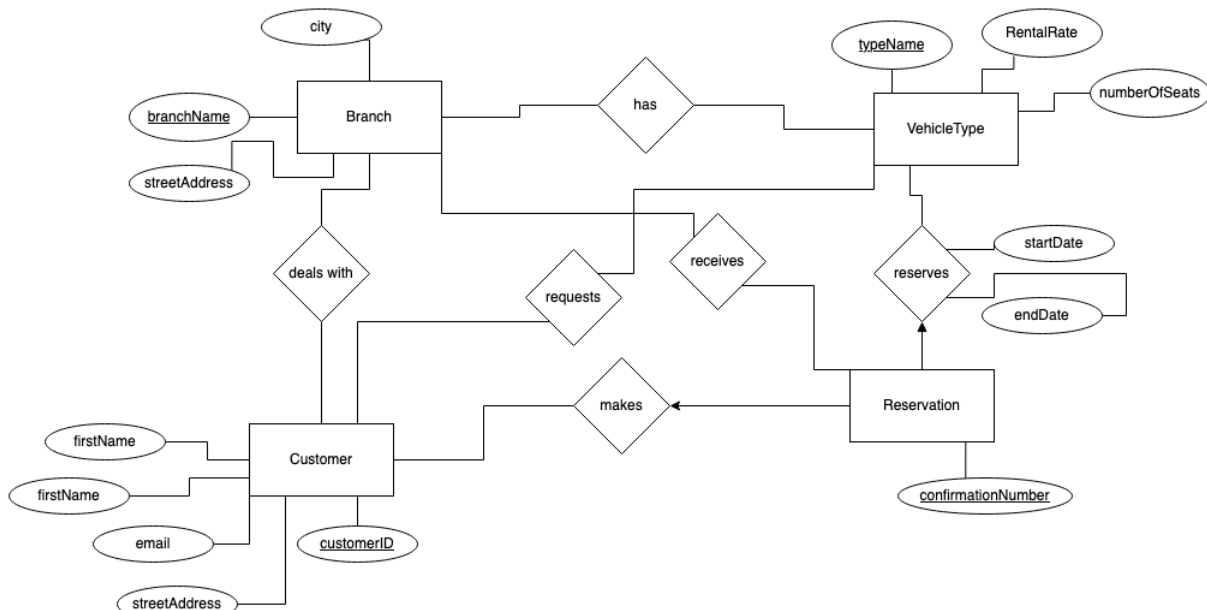
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Note: These are suggested solutions to the tutorial. An ERD has a level of subjectivity and can be interpreted and designed in varying ways; so there is often more than one “correct” answer.

**Task #1:**



**Task #2:**



You may also consider adding a total participation constraint on the relationships that are attached to Reservation.

**Task #3:**

For Task #1, a ternary relationship is simpler to design, and more natural, than making Reservation an entity because “reserves” is an intersection table between all 3 of those main entities. It brings all the “components” together. In Task 2’s situation, while it is true that the confirmationNumber makes a Reservation unique, there is likely to be a lot of redundant information since Reservation will be paired with other entities. This means that the contents of the Reservation entity (imagine if we included more attributes with the reservation, such as credit card number, start/end date, etc.) would be duplicated when we have the relationship between Branch and Reservation, and then the relationship between VehicleType and Reservation, etc.

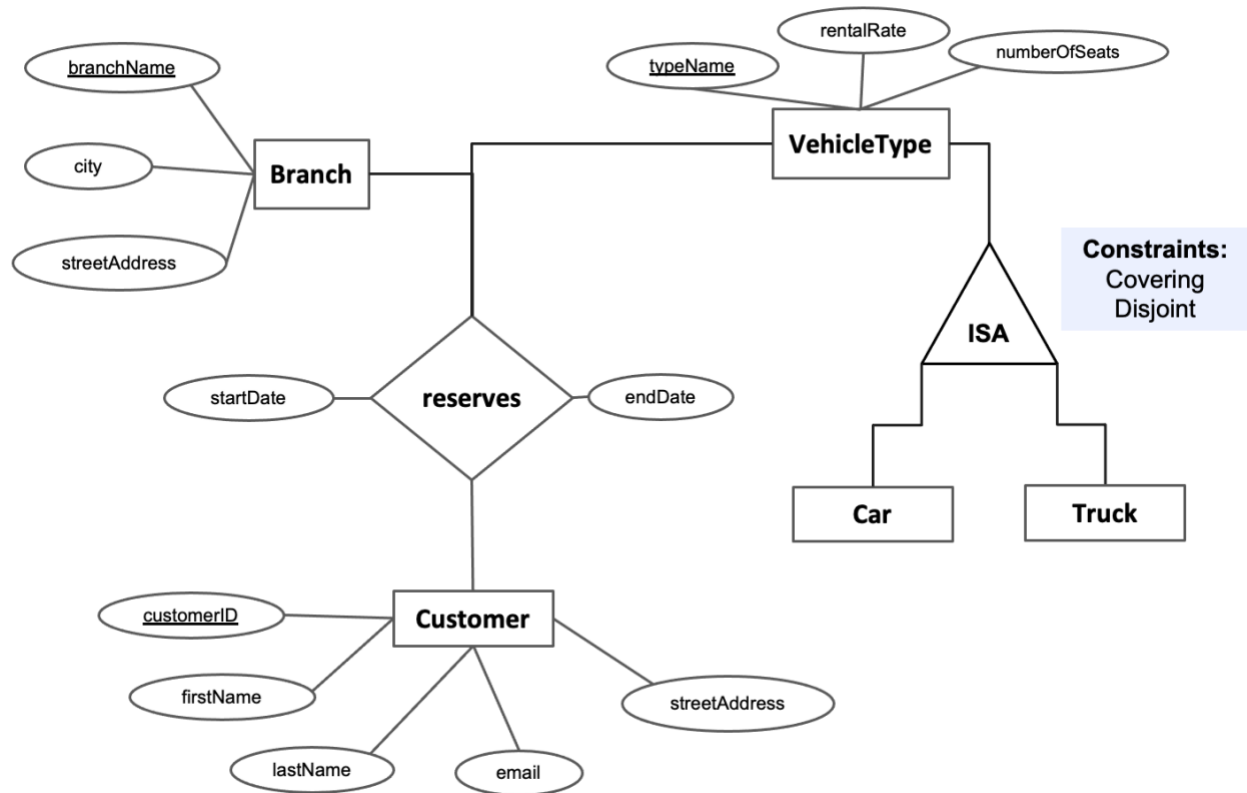
Users are also likely to wind up joining many tables to answer some basic queries; so, that is also a disadvantage. Joins tend to take a relatively long time, in terms of performance; plus, the user has to write longer queries with more joins and WHERE-clause conditions.

The more tables we have, the more work it is for a DBA to maintain them all; plus, the redundancies mean that we will probably have unnecessarily large tables (perhaps taking many megabytes more of space to store them). Plus, we want to make sure that the data is consistent (not out of sync with the other tables).

With binary relationships, depending on the participation and key constraints in the ERD, we might gain some additional flexibility with (at least some of) the binary relationships. For example, maybe we can have multiple Customers associated with a Reservation (e.g., husband and wife), whether we allow a single Reservation to rent more than one vehicle on the same reservation, whether we can return a vehicle to a different Branch than where we rented it (e.g., rent in Vancouver and drop off in Calgary), etc.

Section 2.5.3 of the textbook discussed binary vs. ternary relationships, and provides some additional comments. You may have some additional ideas of your own.

Task #4:



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Task #5:

