

To normalize our classes, repeated attributes in Customer were symbolized as a weak entity and multivalued attributes in Employee, Mechanic, and MaintenanceItem were handled. More attributes were added to each class in order to produce a valid candidate key. After producing a valid CK, we can add surrogate keys to the Customer, Vehicle and Employee classes. While performing a lossless join decomposition for the zipCode within the Customer class would've achieved 1NF, it was denormalized and zipCode, city, and state remained as attributes of Address. This prevents many unnecessary joins since auto shops are likely to have customers that are relatively local to the shop's location. There will be the few customers from more unique zipCodes, but would likely appear less often than local customers.

