Solution Mid II fall 2019
Database Systems CS 203

Solution 01

Decompose PLAYER into more tables based on the non-key dependencies. Then we shall get the tables as follows;

PLAYER (Player-no, Player-name, Player-position, Team)

TEAM (Team, Team-color, Team-captain, Coach-no, Coach-name)

The key for ***PLAYER*** is *Player-no*, and all the others are non-key attributes. Hence, ***PLAYER* is in 2NF (no partial dependencies) and 3NF (no transitive dependencies)**.

The key for ***TEAM*** is *Team*. All the other attributes are non-key attributes and depends on *Team-no*. Hence, ***TEAM* is in 2NF**. TEAM has following transitive dependency;

Team → Coach-no → Coach-name.

Hence, TEAM is not in 3NF. To convert, decompose TEAM as follows;

TEAM (Team, Team-color, Team-captain, Coach-no)

COACH (Coach-no, Coach-name)

Now, ***TEAM* and *COACH* are both in 2NF and 3NF**.

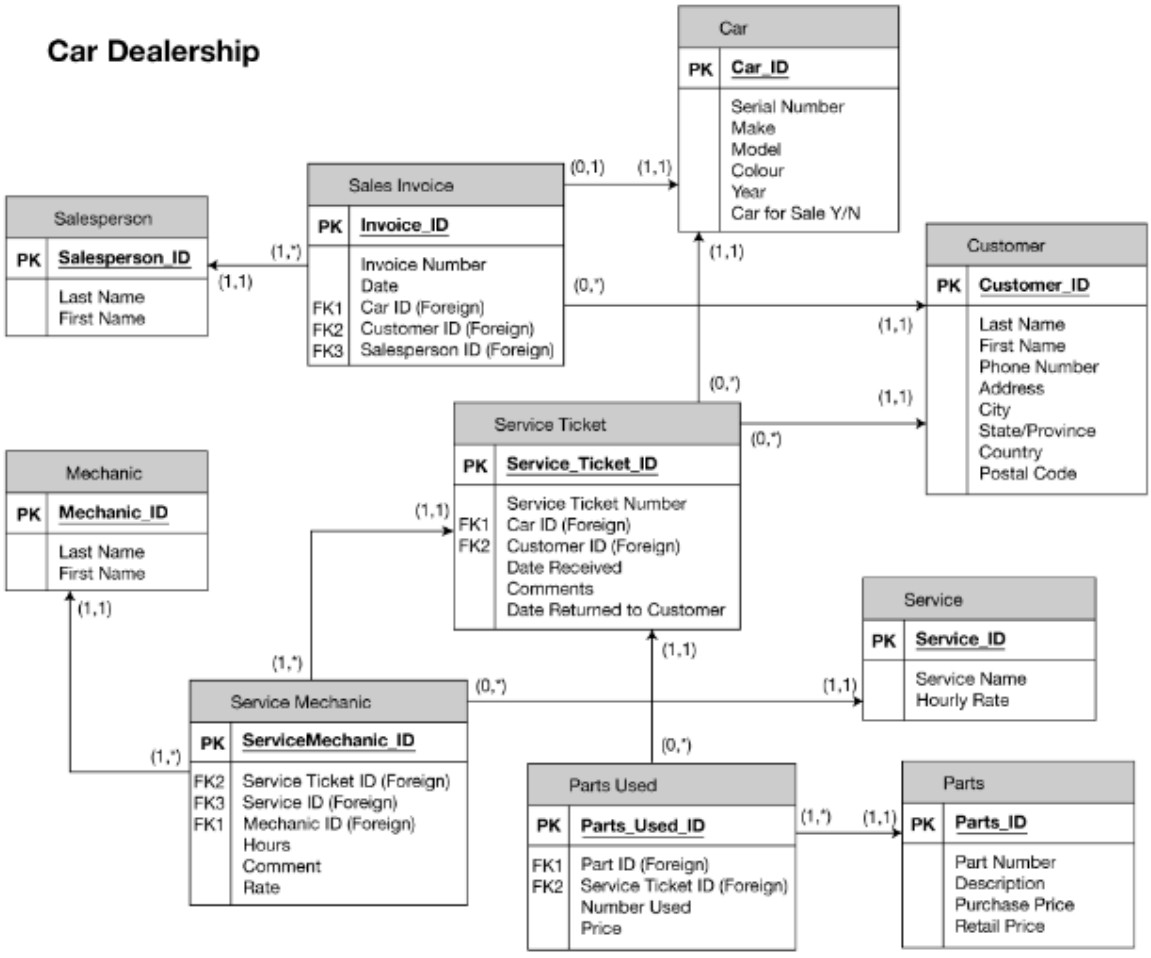
Final set of decomposed tables that are in 3NF are;

PLAYER (*Player-no*, *Player-name*, *Player-position*, *Team*)

TEAM (*Team*, *Team-color*, *Team-captain*, *Coach-no*)

COACH (*Coach-no*, *Coach-name*)

Solution 02


Car Dealership
Car
PK Car_ID
Serial Number
Make
Model
Colour
Year
Car for Sale Y/N
Sales Invoice
PK Invoice_ID
Invoice Number
Date
FK1 Car ID (Foreign)
FK2 Customer ID (Foreign)
FK3 Salesperson ID (Foreign)
Salesperson
PK Salesperson_ID
Last Name
First Name
Customer
PK Customer_ID
Last Name
First Name
Phone Number
Address
City
State/Province
Country
Postal Code
Service Ticket
PK Service_Ticket_ID
Service Ticket Number
FK1 Car ID (Foreign)
FK2 Customer ID (Foreign)
Date Received
Comments
Date Returned to Customer
Mechanic
PK Mechanic_ID
Last Name
First Name
Service
PK Service_ID
Service Name
Hourly Rate
Service Mechanic
PK ServiceMechanic_ID
FK2 Service Ticket ID (Foreign)
FK3 Service ID (Foreign)
FK1 Mechanic ID (Foreign)
Hours
Comment
Rate
Parts Used
PK Parts_Used_ID
FK1 Part ID (Foreign)
FK2 Service Ticket ID (Foreign)
Number Used
Price
Parts
PK Parts_ID
Part Number
Description
Purchase Price
Retail Price
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(1,*)
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(0,*)
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