

CSC 540 - DATABASE MANAGEMENT CONCEPTS & SYSTEMS

FALL 2018 PROJECT 1 - DATABASE APPLICATION DESIGN & IMPLEMENTATION

CARS - CAR Repair and Service management system

Milestone 1 Report - ER Model and Tables

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Tables:

All the tables in the following section have already been considered decomposition, therefore, all the tables are in BCNF form.

1. Manager(Employee_ID, Name, Address, Monthly_Pay)
 - Holds data of manager
 - Functional dependencies: No other Fds except keys determines everything
2. Receptionist(Employee_ID, Name, Address, Monthly_Pay)
 - Holds data of Receptionist
 - Functional dependencies: No other Fds except keys determines everything
3. Mechanic(Employee_ID, Name, Address, Hour_Worked, Hourly_Pay)
 - Holds data of Mechanic
 - Functional dependencies: No other Fds except keys determines everything
4. Manager_Work_At(Employee_ID, Service_Center_ID)
 - Holds data of relationship of manage and service center
 - Constraints:
 - one manager can only work at a single service center
 - A service center can only have one manager
 - Employee_ID foreign key from table 1 Manager Table
 - Service_Center_ID foreign key from table 7 Service Center Table
 - Arity of the relationship: Binary
 - Functional dependencies: No other Fds except keys determines everything
5. Receptionist_Work_At(Employee_ID, Service_Center_ID)
 - Holds data of relationship of manage and service center
 - Constraints:
 - one Receptionist can only work at a single service center
 - A service center can only have one Receptionist
 - Employee_ID foreign key from table 2 Receptionist Table
 - Service_Center_ID foreign key from table 7 Service Center Table
 - Arity of the relationship: Binary
 - Functional dependencies: No other Fds except keys determines everything
6. Mechanic_Work_At(Employee_ID, Service_Center_ID)
 - Holds data of relationship of manage and service center
 - Constraints:
 - one Mechanic can only work at a single service center
 - A service center has at least 5 Mechanics
 - Employee_ID foreign key from table 3 Mechanic Table
 - Service_Center_ID foreign key from table 7 Service Center Table

- Functional dependencies: No other Fds except keys determines everything
7. Service_Center(Service_Center_ID, Name, Address, Tel_Number)
- Holds data of service center
 - Constrains :
 - Every state has 3 centers
 - Functional dependencies: No other Fds except keys determines everything
8. Customer(Customer_ID, Name, Email_Address, Address, Phone_Number)□
- Holds data of customer
 - Functional dependencies: No other Fds except keys determines everything
9. Car(License_Plate_Number, Make, Model, Year, Last_Mileage, Type_Recent_Service, Date_Recent_Service)□
- Holds data of cars
 - Functional dependencies: None
10. Own(Customer_ID, License_Plate_Number)
- Shows which customer has which car serviced/repaired.
 - Constraints:
 - Each customer has at least one car
 - Each car has at least one customer
 - Customer_ID foreign key from table 8 Customer Table
 - License_Plate_Number foreign key from table 9 Car Table
 - Functional dependencies: No other Fds except keys determines everything
 - Arity of the relationship: Binary
11. Distributor(Distributor_ID)
- Holds data of distributor
 - Functional dependencies: No other Fds except keys determines everything
12. Part(Part_ID, Part_Name, Part_quantity, Unit_Price, Threshold)
- Holds data of parts
 - Functional dependencies: No other Fds except keys determines everything
13. Seller_Center_Order(Seller_Center_ID, Order_ID, quantity, Part_ID, date, Status, Buyer_Center_ID)
- Holds data of parts orders from one service center to another service center
 - Functional dependencies: No other Fds except keys determines everything
 - Constraints:
 - One service center can have multiple orders

- One order has at least one part.
 - Seller_Center_ID: foreign key from table 7 Service Center table key: Service_Center_ID
 - Buyer_Center_ID: foreign key from table 7 Service Center table key: Service_Center_ID
 - Part_ID: foreign key from table 12 Part table key: Part_ID
14. Seller_Distributor_Order(Seller_Distributor_ID, Order_ID, quantity, Part_ID, date, Status, Buyer_Center_ID)
- Holds data of parts orders from distributor to another service center
 - Functional dependencies: No other Fds except keys determines everything
 - Constraints:
 - One service center can have multiple orders
 - One order has at least one part.
 - Seller_Distributor_ID: foreign key from table 11 Distributor table key: Distributor_ID
 - Buyer_Center_ID: foreign key from table 7 Service Center table key: Service_Center_ID
 - Part_ID: foreign key from table 12 Part table key: Part_ID
15. Service(Service_Type, Time_Needed)
- Holds data of what kind of service can be provided
 - Functional dependencies: No other Fds except keys determines everything
16. Need(Service_Type, Part_ID, quantity)
- Holds data for what parts is needed for some service type.
 - Constraints:
 - Service_Type foreign key from table 15 Service Table
 - Part_ID: foreign key from table 12 Part table key: Part_ID
 - Functional dependencies: No other Fds except keys determines everything
 - Arity of the relationship: Binary
17. Appointment(Service_Type, Service_Center_ID, Customer_ID , Licence_Plate_Number, Employee_ID , Appointment_Time)
- Holds data of appointment, what kind of service type, where, when, whose car, and who is going to service this car.
 - Constraints:
 - Service_Type foreign key from table 15 Service table: Service_Type
 - Service_Center_ID foreign key from 7 Service_Center table key: Service_Center_ID
 - Customer_ID foreign key from table 8 Customer table: Customer_ID

- Licence_Plate_Number foreign key from table 9 Car table :
Licence_Plate_Number
 - Employee_ID foreign key from table 3 Mechanic table: Employee_ID
 - Functional dependencies: No other Fds except keys determines everything
 - Arity of the relationship: Penta(5)
18. Notification (Seller_Distributor_ID, Notification_Time, Due_Date, Notification_Content)
- Holds data of notification to send to customer
 - Constraints:
 - Seller_Distributor_ID foreign key from table 14 Seller_Distributor_Order table:
Seller_Distributor_ID
 - Functional dependencies: No other Fds except keys determines everything

