

PHRASE CONSTRAINTS

ASSERTION: Since, ORACLE 12 does not allow Assertions, we have used CHECK statements for constraints 1 and 2.

CHECK	Each center operates 5 days a week (M-F) from 8 AM to 8 PM. Some (not all) are also open on Saturdays from 9am - 1pm.	OPENING_TIME VARCHAR2(20) CONSTRAINT OPENING_TIME CHECK (OPENING_TIME in('8:00 AM', '9:00 AM')), CLOSING_TIME VARCHAR(20) CONSTRAINT CLOSING_TIME CHECK (CLOSING_TIME in('8:00 PM', '1:00 PM')),,
CHECK	Each employee is associated with only one service center. Each employee can only play one role at a time.	CHECK (emp_role in('MANAGER','RECEPTIONI ST','MECHANIC'))
FOREIGN KEY	The price for each service may vary in different stores; however, the duration for each service is the same in every store. For example, at one center, brake repair in a Honda may cost \$50 while at another store it may cost \$70, but the service takes the same 3hrs at both centers.	CREATE TABLE SCHAVE(price INTEGER, duration VARCHAR(15), s_no INTEGER NOT NULL, sc_id VARCHAR(20), vin varchar(8), PRIMARY KEY(vin, s_no, sc_id), FOREIGN KEY(s_no) REFERENCES SERVICES(s_no) ON DELETE CASCADE, FOREIGN KEY(sc_id) REFERENCES SERVICE_CENTER(sc_id) ON DELETE CASCADE, FOREIGN KEY(vin) REFERENCES VEHICLE(vin) ON DELETE CASCADE);
TRIGGER	Ensuring that two customers do not have the same username.	CREATE TRIGGER CHECK_EMPLOYEE

		AFTER INSERT ON EMPLOYEE FOR EACH ROW BEGIN DECLARE temp INT; temp:= 0; temp:= SELECT COUNT(*) from EMPLOYEE where new.username IN (Select username from employee_auth); IF temp > 1 DELETE FROM EMPLOYEE WHERE new.username EXISTS (Select username from EMPLOYEE_AUTH); ELSE INSERT INTO EMPLOYEE_AUTH(EMP_ID, SC_ID,EMP_ROLE,USERNA ME,PASSWORD) VALUES("'" + emp_id + "'," + sc_id + "', '" + role + "'," + username + "'," + password + "'); END IF; END
PROCEDURE	Created a procedure to insert rows in the Vehicle Table.	CREATE PROCEDURE insertVehicle AS INSERT INTO VEHICLE(vin, manufacturer, current_mileage, year) VALUES("'" + vin_number + "', "'" + manufacturer_name + "', "'" + mileage + "', '" + year + "'); INSERT INTO VEHICLE_OWNED(sc_id,c_id, vin) VALUES("'" + vin_number + "', "'" + sc_id + "', '" + c_id + "'); GO; EXEC insertVehicle;

FUNCTIONAL DEPENDENCIES:

NOTE - All the primary keys in every table is a Functional Dependency, uniquely identifying every attribute of the table.

Hence, excluding the primary keys, the 5 FD's identified are:

1. SE_REQUESTED (sc_id, se_id \rightarrow c_id)
2. SCHAVE (s_no, sc_id, vin \rightarrow duration)
3. SCHAVE (s_no, sc_id, vin \rightarrow price)
4. CUSTOMER_ADDED (sc_id, c_id \rightarrow emp_id)
5. VM_SERVICED (c_id, sc_id \rightarrow emp_id)
6. EMP_AUTH (username \rightarrow emp_id, sc_id)
7. PRICE_CHECK (sc_id, model, s_no \rightarrow price)
8. VEHICLE_OWNED (vin \rightarrow customer)

The Service Center table is in BCNF as all the determinants are candidate keys, here SC_ID is the primary key which determines all the attributes in the table. Hence, for the same primary key, the values would never change. Therefore, the table is in BCNF.

In the Employee table, SC_ID and EMP_ID determine all the attributes in the table. They are superkeys for the table which makes it BCNF.

In the Customer table, C_ID and EMP_ID determine all the attributes in the table. They are superkeys for the table which makes it BCNF.

There are three tables for Services, which includes Repair and Maintenance Services. In these tables, the SERVICE_NUMBER and the SERVICE_NAME determine other attributes which makes them superkeys. Hence the table which makes it BCNF.

There is a table MAINTENANCE_DURATION which stores the schedule_name and the duration of the schedule. There is also a maintenance table which stores the details of the schedules with individual services in each schedule. We have created a separate table for duration where the schedule_name is the only superkey. Hence, the table is in BCNF.

Each table contains attributes of one entity only, that is, distinct concepts are kept in separate tables.