جامعة أم القرى
UMM AL-QURA UNIVERSITY

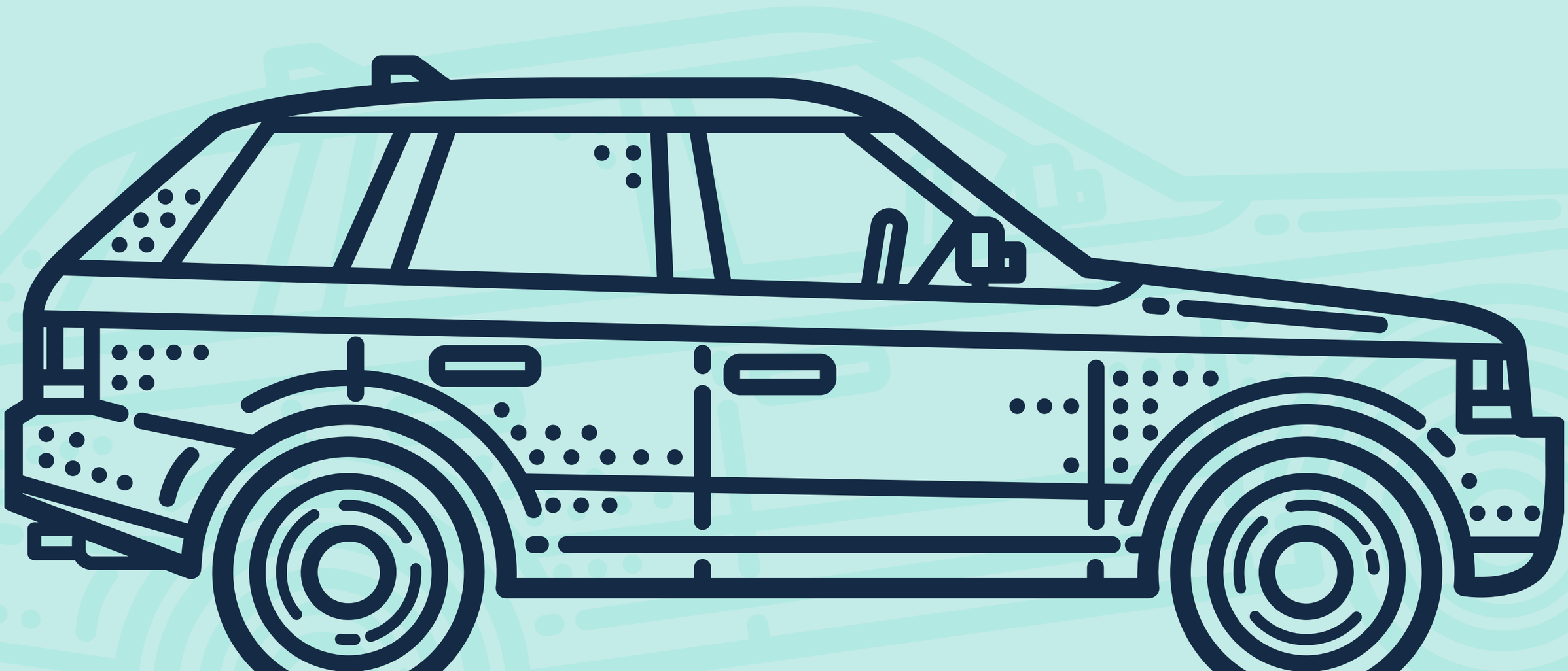
Database Project

Auto Show System

Group number:5

Supervised by

Dr.Asmaa Alayed



Group members:

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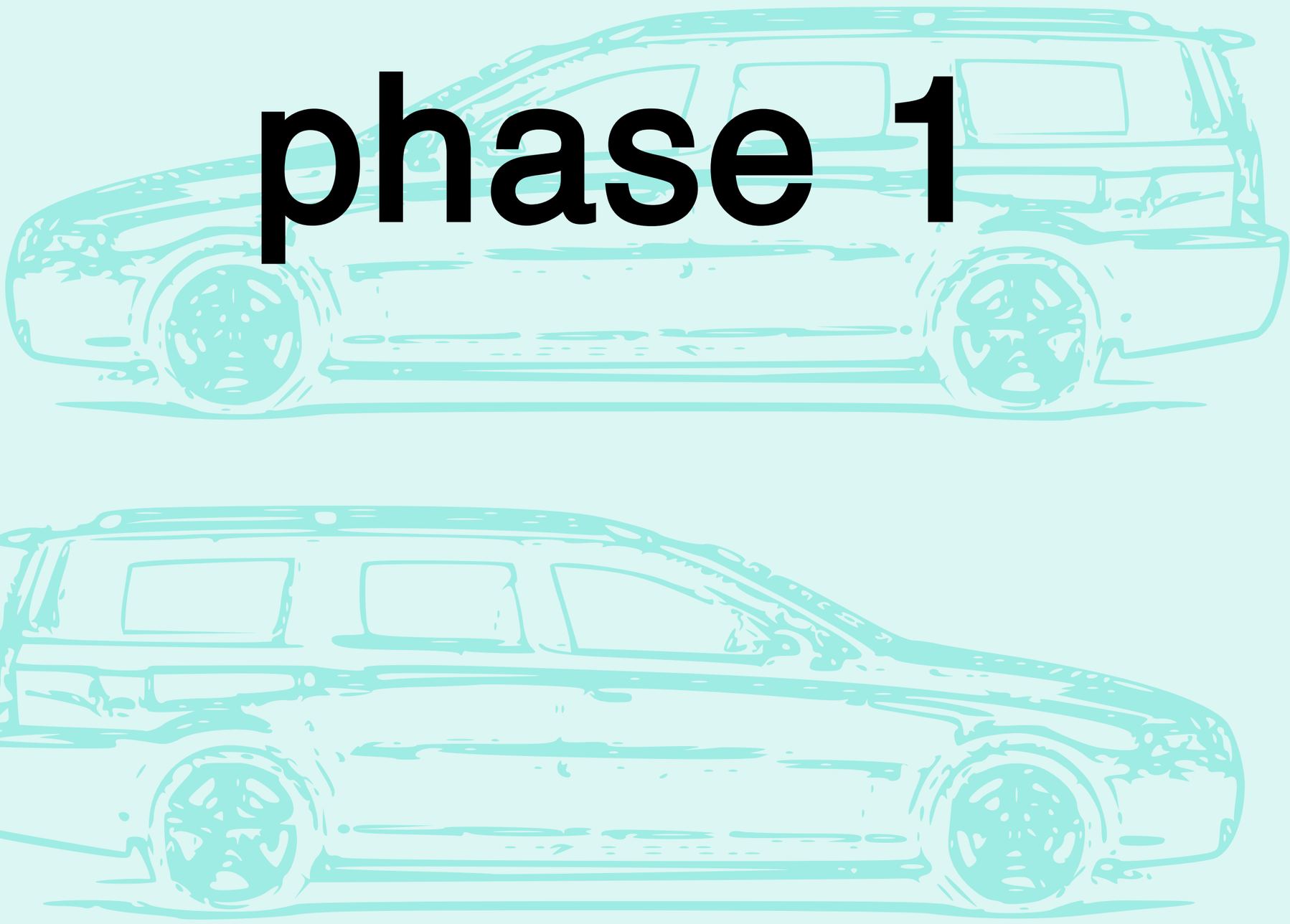
Azizah Hamed 442018701

Huda Zaini 443008079

Refal Alhazmi 442002079

phase 1



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Introduction

A database that is like a language of communication between the company and its members, customers and employees, that contributes to accelerating the company's progress over its competitors in the market because it is characterized by accuracy in collecting and recording data, speed in dealing with it, monitoring sales and what the market requires, and a design that is easy to use. This is all in our Auto Show System

Team Member task

	Nrdeen	Fay	Aziza	Jood	Azizah Hamed	Huda	Refal
Entities	✓	✓	✓	✓	✓	✓	✓
Business Rule	✓		✓		✓	✓	
UML notation		✓		✓			
Chen’s notation	✓						✓
Mapping	✓	✓	✓	✓		✓	✓
Normalization	✓	✓		✓	✓		✓
Create Table	✓	✓	✓	✓	✓	✓	✓
Insert data	✓	✓	✓	✓	✓	✓	✓
Delete and updated, Select	✓	✓	✓	✓	✓	✓	✓

Business rules:

Our project is creating data base for Auto Show System.

Customer:

- **There are many CUSTOMERS who come to the car show to get one or more SERVICES, each CUSTOMER has a name (First name, Last name), a unique customer ID, date of birth, nationality, gender, and more than one phone number, address (Country, City, Postcode), ID expiration.**
- **Each CUSTOMER can own one or more CONTRACTS, and each CONTRACT is owned by one CUSTOMER.**

Employee:

- **Each EMPLOYEE must extract one or more CONTRACTS for his customers, and each CONTRACT extracted by one EMPLOYEE.**
- **Each EMPLOYEE has a name (first name, last name), unique employee ID, date of birth, gender, and more than one phone number, salary, specialization (university, date of graduation), work year in the Auto show, current job.**

Contract:

- **It is important in every CONTRACT to holds a SERVICE, each CONTRACT has a date of sale, a unique contact number, and pay (full batch, half batch, installment).**
- **Each CONTRACT must include only one PRODUCT, and each PRODUCT is included in one CONTRACT.**

Business rules:

• Product:

. Each PRODUCT has a unique VIN number.

•For each PRODUCT, the DB keep record of more than one color, price, and more than one type of vehicle.

•Each PRODUCT is produced by its own MANUFACTURE.

Services:

•The system offers many SERVICES such as car rental, and selling car by providing maintenance data, car plate, soshibal car, and the SERVICE has a short name.

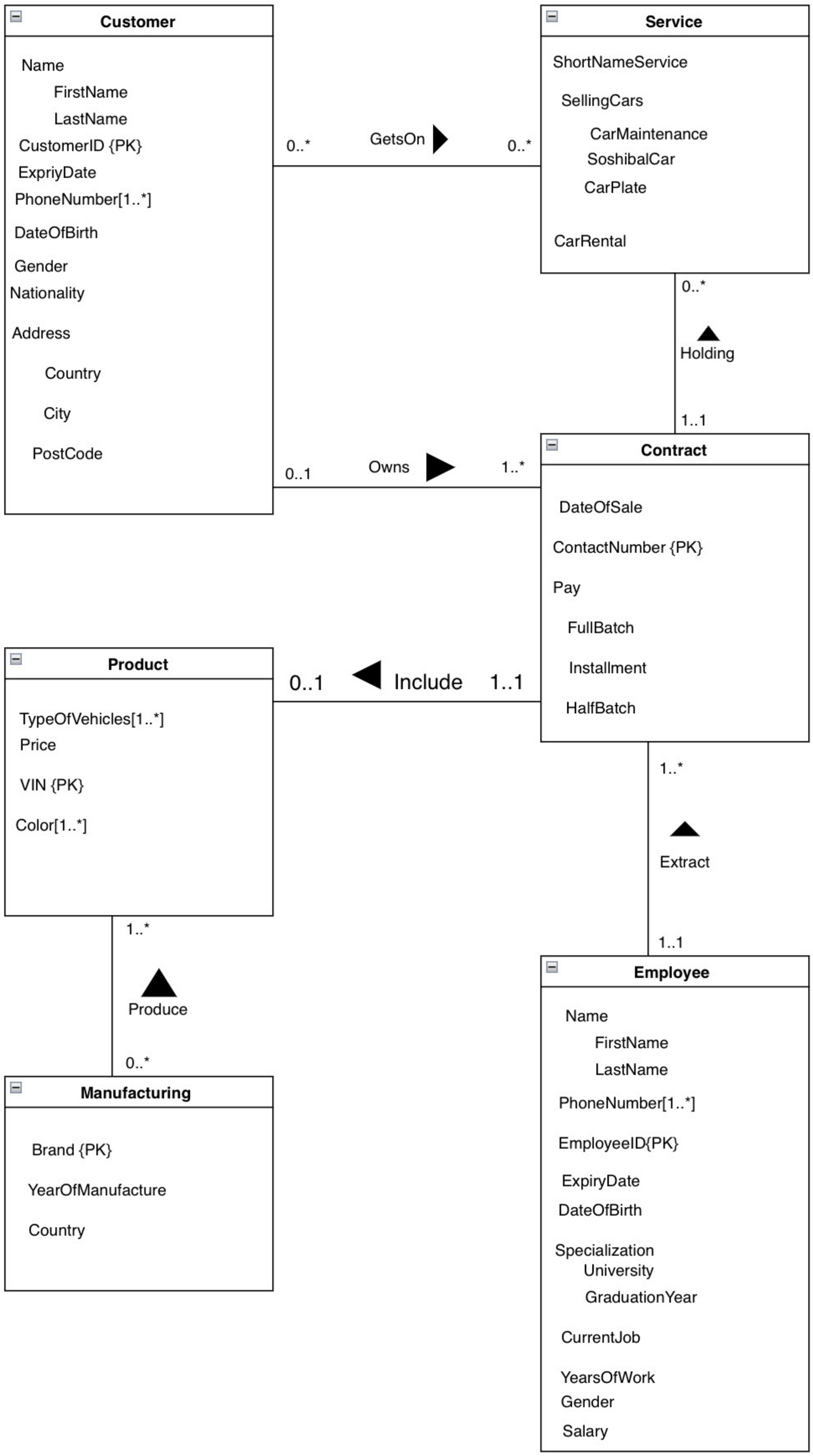
• Each SERVICE must be associated with a CUSTOMER and a his CONTRACT.

Manufacturing:

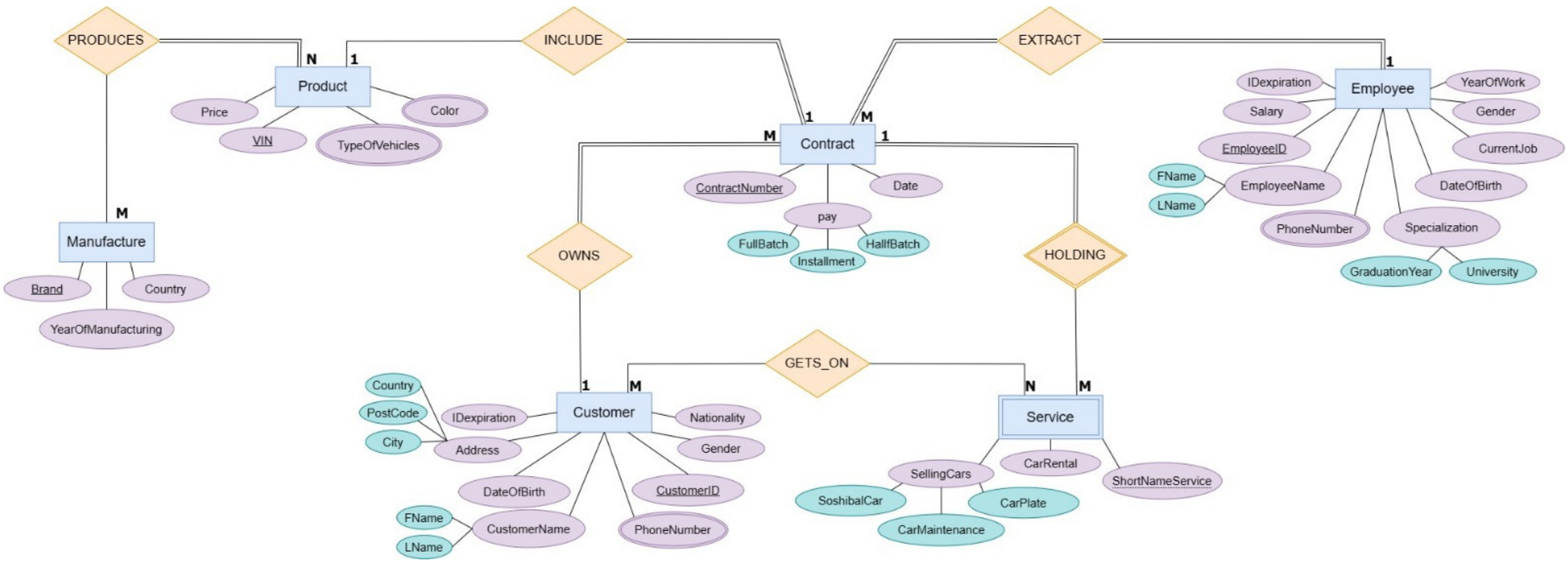
•Each MANUFACTURES produce many different PRODUCTS.

• For each MANUFACTURING process will be a record data of a unique brand and country and Year of manufacturing.

UML notation :



Chen’s notation:



phase 2

Relational Schema Mapping :

Step 1 : Mapping of Regular Entity Types

Employee

EmployeeID	IDexpiration	FName	LName	DateOfBirth	Gender	GraduationYear	University	CurrentJob	YearOfWork	Salary

Customer

Nationality	CustomerID	IDexpiration	FName	LName	DateOfBirth	Gender	Country	PostCode	City

Contract

ContractNumber	Date	FullBatch	HallfBatch	Installment

Manufacture

Brand	Country	YearOfManufacturing

Product

VIN	Price

Step 2 : Mapping of weak entity into relation

Contract

ContractNumber	Date	FullBatch	HallfBatch	Installment

Service

CarRental	CarPlate	CarMaintenance	SoshibalCar	shortNameService	ContractNumber

Step 3:

Mapping of Binary 1:1 Relationship Types

Contract

ContractNumber	Date	FullBatch	HallfBatch	Installment	VIN

Product

VIN	Price

Step 4:

Mapping of Binary 1:M Relationship Types

Extract relationships type:

Contract

ContractNumber	Date	FullBatch	HallfBatch	Installment	VIN	EmployeeID

Employee

EmployeeID	IDexpiration	FName	LName	DateOfBirth	Gender	GraduationYear	University	CurrentJob	YearOfWork	Salary

OWNS relationships type:

Contract

ContractNumber	Date	FullBatch	HallfBatch	Installment	VIN	EmployeeID	CustomerID

Customer

Nationality	CustomerID	IDexpiration	FName	LName	DateOfBirth	Gender	Country	PostCode	City

Step 5:

Mapping of Binary M:N Relationship Types

Relationship1:

Customer

Nationality	CustomerID	IDexpiration	FName	LName	DateOfBirth	Gender	Country	PostCode	City

Service

CarRental	CarPlate	CarMaintenance	SoshibalCar	shortNameService	ContractNumber

Gets-On

CustomerID	ContractNumber	shortNameService

Relationship 2:

Manufacture

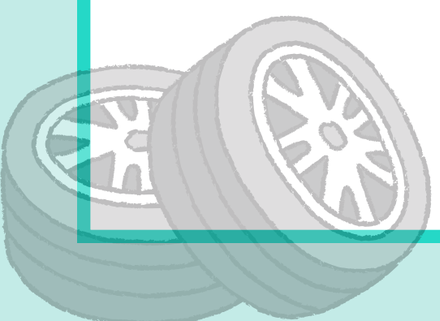
Brand	Country	YearOfManufacturing

Product

VIN	Price

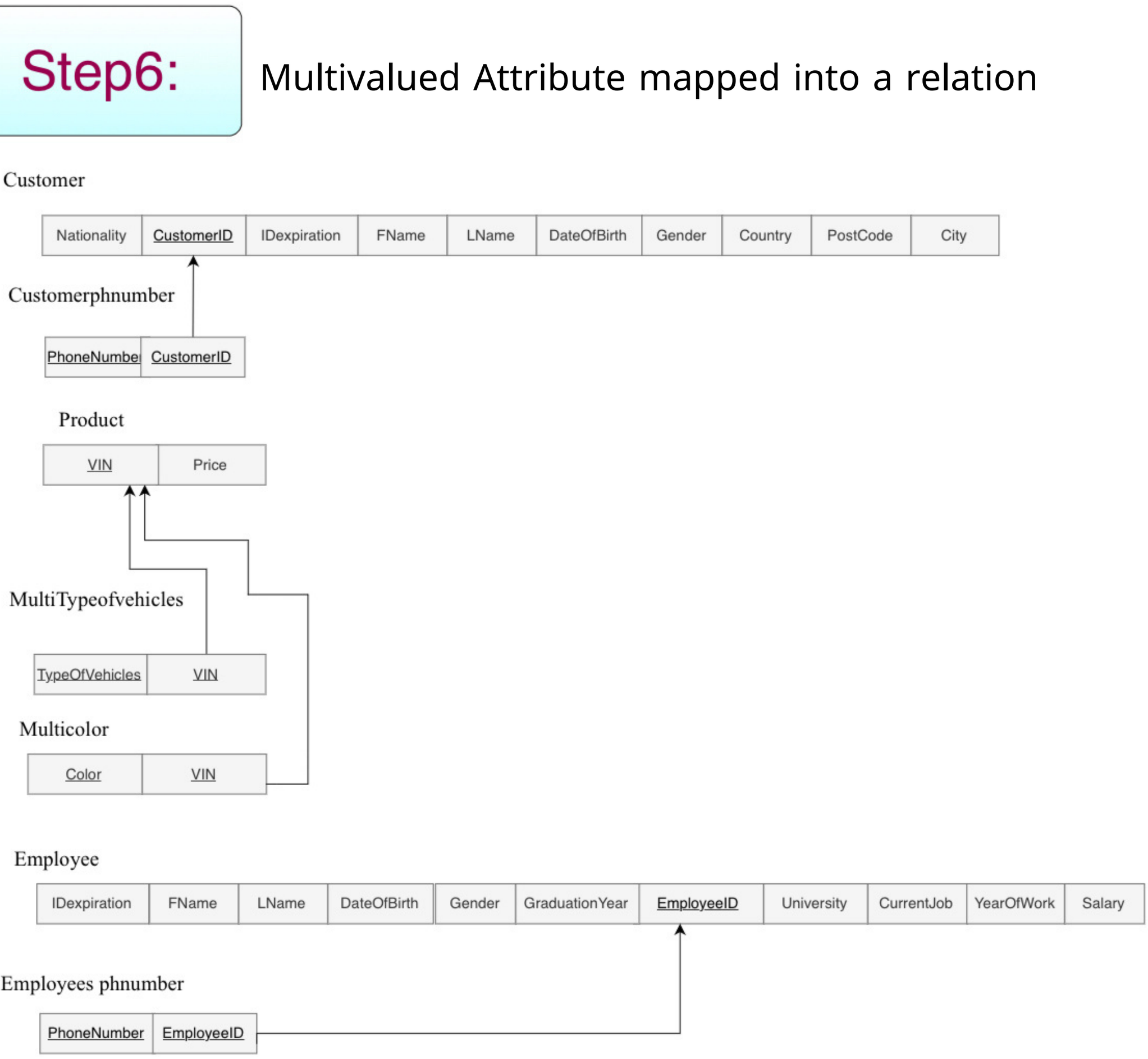
Produces

Brand	VIN



Step6:

Multivalued Attribute mapped into a relation

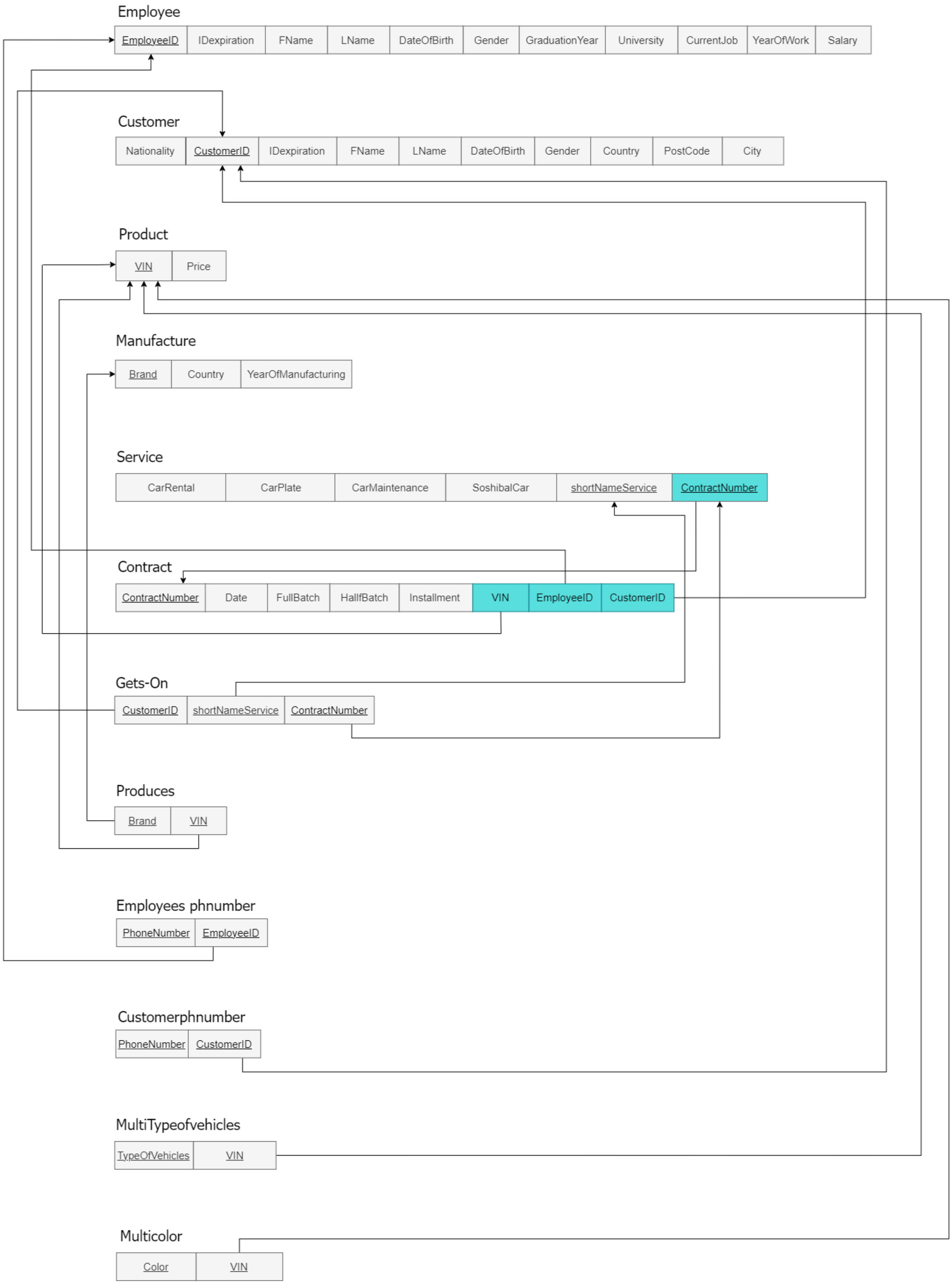


Step 7:

Mapping of N-ary relationship types

None

Final mapping :



Normalization :

Employee

EmployeeID	IDexpiration	FName	LName	DateOfBirth	Gender	GraduationYear	University	CurrentJob	YearOfWork	Salary

There is No multivalued attributes was found therefore the table in the 1NF

There is No partial dependency therefore the table in the 2NF

There is No transitive dependency therefore the table in the 3NF

Customer

Nationality	CustomerID	IDexpiration	FName	LName	DateOfBirth	Gender	Country	PostCode	City

There is No multivalued attributes was found therefore the table in the 1NF

There is No partial dependency therefore the table in the 2NF

There is No transitive dependency therefore the table in the 3NF

Employees phnumber

PhoneNumber	EmployeeID

There is No multivalued attributes was found therefore the table in the 1NF

There is No partial dependency therefore the table in the 2NF

There is No transitive dependency therefore the table in the 3NF

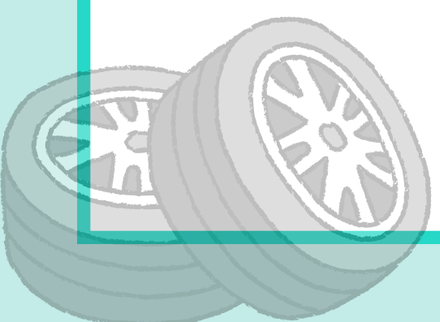
Customerphnumber

PhoneNumbe	CustomerID

There is No multivalued attributes was found therefore the table in the 1NF

There is No partial dependency therefore the table in the 2NF

There is No transitive dependency therefore the table in the 3NF



MultiTypeofvehicles

TypeOfVehicles	VIN

There is No multivalued attributes was found therefore the table in the 1NF

There is No partial dependency therefore the table in the 2NF

There is No transitive dependency therefore the table in the 3NF

Multicolor

Color	VIN

There is No multivalued attributes was found therefore the table in the 1NF

There is No partial dependency therefore the table in the 2NF

There is No transitive dependency therefore the table in the 3NF

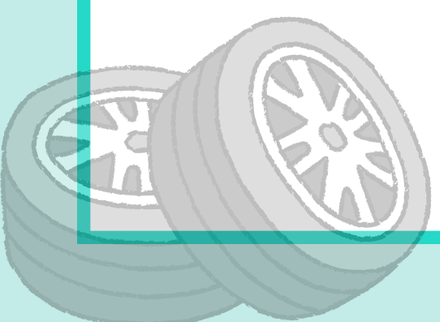
Gets-On

CustomerID	shortNameService	ContractNumber

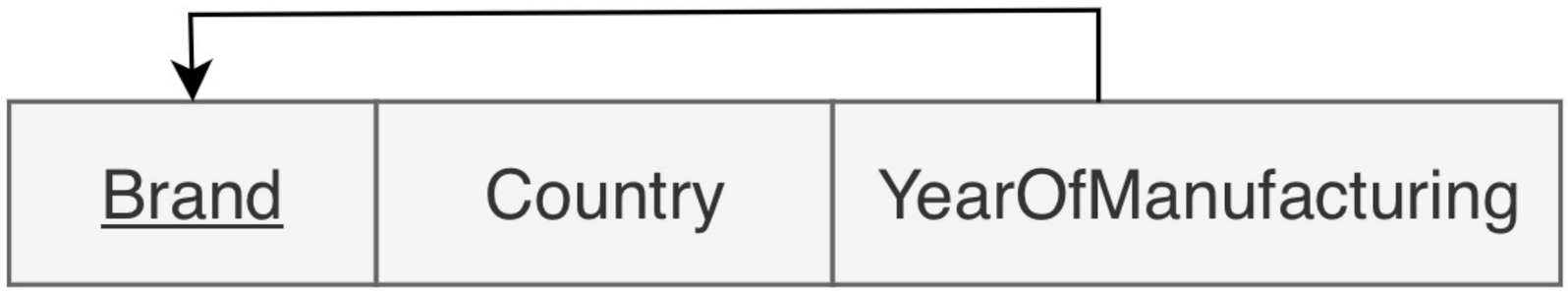
There is No multivalued attributes was found therefore the table in the 1NF

There is No partial dependency therefore the table in the 2NF

There is No transitive dependency therefore the table in the 3NF



Manufacture



There is multivalued attributes were found therefore the table in not the 1NF

There is no partial dependency therefore the table in the 2NF

There is no transitive dependency therefore the table in the 3NF

Manufacture

YearOfManufacturing

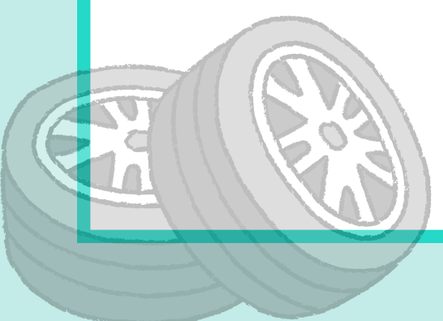
There is no multivalued attributes were found therefore the table in the 1NF

Product

There is No multivalued attributes was found therefore the table in the 1NF

There is No partial dependency therefore the table in the 2NF

There is No transitive dependency therefore the table in the 3NF



Contract

ContractNumber	Date	FullBatch	HallfBatch	Installment	VIN	EmployeeID	CustomerID

There is No multivalued attributes was found therefore the table in the 1NF

There is No partial dependency therefore the table in the 2NF

There is No transitive dependency therefore the table in the 3NF

Produces

Brand	VIN

There is No multivalued attributes was found therefore the table in the 1NF

There is No partial dependency therefore the table in the 2NF

There is No transitive dependency therefore the table in the 3NF

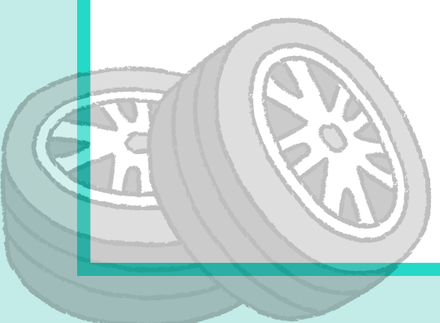
Service

CarRental	CarPlate	CarMaintenance	SoshibalCar	shortNameService	ContractNumber

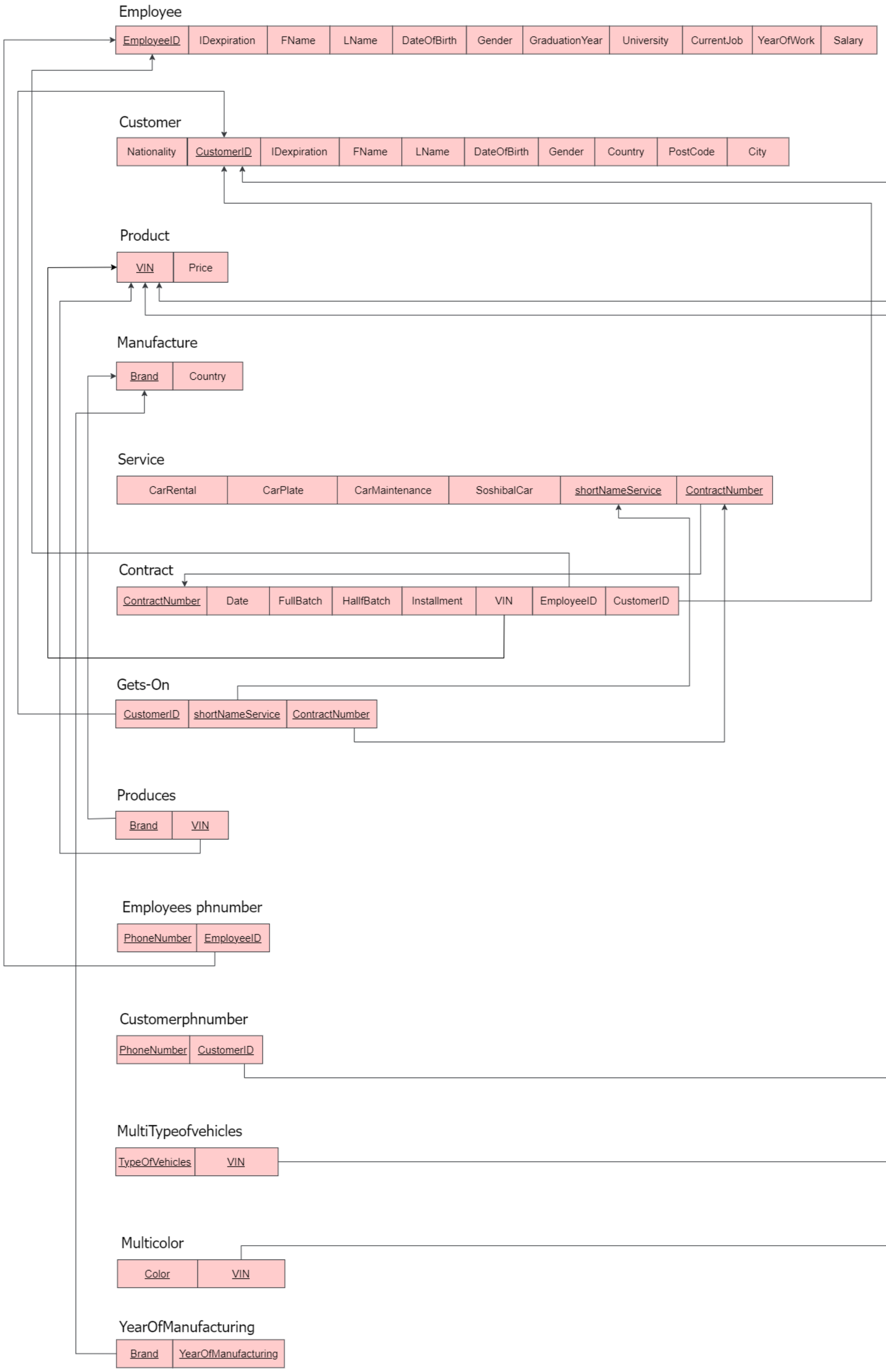
There is No multivalued attributes was found therefore the table in the 1NF

There is No partial dependency therefore the table in the 2NF

There is No transitive dependency therefore the table in the 3NF



Final Normalization:



phase 3

CREATE:

CREATE SCHEMA :

```
1
2 •   CREATE SCHEMA `CarShow` ;
3 •   USE `CarShow` ;
4
```

Output

Action Output

#	Time	Action
1	17:17:51	CREATE SCHEMA `CarShow`
2	17:25:13	USE `CarShow`

CREATE:

CREATE `Employee` table:

Table: employee

Columns:

FName	varchar(50)
Lname	varchar(50)
EmployeeID	int PK
IDexpiration	int
DateOfBirth	date
University	varchar(50)
CurrentJob	varchar(50)
GraduationYear	int
YearOfWork	int
Gender	varchar(6)
Salary	decimal(6,2)

```sql
CREATE TABLE Employee(
FName               VARCHAR(50),
Lname               VARCHAR(50),
EmployeeID          INT(10)     NOT NULL,
IDexpiration        INT(4),
DateOfBirth         DATE,
University          VARCHAR(50),
CurrentJob          VARCHAR(50),
GraduationYear      INT(4),
YearOfWork          INT(2),
Gender              VARCHAR(6),
Salary              DECIMAL(6,2),
CONSTRAINT Employee_PK PRIMARY KEY(EmployeeID)
);
```

CREATE `Customer` table:

Table: customer

Columns:

CustomerID	int PK
Nationality	varchar(200)
IDexpiration	int
FName	varchar(30)
LName	varchar(30)
DateOfBirth	date
Gender	varchar(6)
Country	varchar(200)
PostCode	int
City	varchar(200)

```sql
CREATE TABLE Customer(
CustomerID          INT(10)     NOT NULL,
Nationality         VARCHAR(200),
IDexpiration        INT(4),
FName               VARCHAR(30),
LName               VARCHAR(30),
DateOfBirth         DATE,
Gender              VARCHAR(6),
Country             VARCHAR(200),
PostCode            INT(5),
City                VARCHAR(200),
CONSTRAINT Customer_PK PRIMARY KEY( CustomerID )
);
```

CREATE `Product` table:

Table: product

Columns:

VIN	varchar(15) PK
Price	decimal(10,2)

```sql
CREATE TABLE Product (
VIN                 VARCHAR(15) NOT NULL ,
Price               DECIMAL(10,2) ,
CONSTRAINT Product_PK  PRIMARY KEY ( VIN )
);
```

CREATE:

CREATE `Contract` table:

Administration Schemas

Information

Table: contract

Columns:

ContractNumber	int PK
Date	date
FullBatch	decimal(10,0)
HallfBatch	decimal(10,0)
Installment	decimal(10,0)
VIN	varchar(15)
EmployeeID	int
CustomerID	int

```sql
CREATE TABLE Contract (
ContractNumber     INT(10)     NOT NULL ,
`Date`             Date ,
FullBatch          DECIMAL ,
HallfBatch         DECIMAL ,
Installment        DECIMAL ,
VIN                VARCHAR(15) NOT NULL      UNIQUE,
EmployeeID         INT(10)                   UNIQUE,
CustomerID         INT(10)                   UNIQUE,
CONSTRAINT Contract_PK  PRIMARY KEY( ContractNumber ) ,
CONSTRAINT Contract_FK1 FOREIGN KEY (EmployeeID)  REFERENCES Employee(EmployeeID)
ON DELETE CASCADE
ON UPDATE CASCADE,
CONSTRAINT Contract_FK2 FOREIGN KEY (CustomerID)  REFERENCES Customer(CustomerID)
ON DELETE CASCADE
ON UPDATE CASCADE,
CONSTRAINT Contract_FK3 FOREIGN KEY (VIN)  REFERENCES Product(VIN)
ON DELETE CASCADE
ON UPDATE CASCADE
);
```

CREATE `Manufacture` table:

Table: manufacture

Columns:

Brand	varchar(20) PK
Country	varchar(200)

```sql
CREATE TABLE Manufacture (
Brand                VARCHAR(20) NOT NULL,
Country              VARCHAR(200),
CONSTRAINT Manufacture_PK PRIMARY KEY(Brand)
);
```

CREATE `Produces` table:

Table: produces

Columns:

Brand	varchar(15) PK
VIN	varchar(15) PK

```sql
CREATE TABLE Produces(
Brand              VARCHAR(15) NOT NULL,
VIN                VARCHAR(15) NOT NULL,
CONSTRAINT Produces_PK PRIMARY KEY(Brand,VIN),
CONSTRAINT Produces_FK1 FOREIGN KEY (Brand) REFERENCES Manufacture(Brand)
ON DELETE CASCADE
ON UPDATE CASCADE,
CONSTRAINT Produces_FK2 FOREIGN KEY (VIN) REFERENCES Product(VIN)
ON DELETE CASCADE
ON UPDATE CASCADE
);
```

CREATE:

CREATE `Service` table:

Table: service

Columns:

CarRental	varchar(20)
CarPlate	varchar(12)
CarMaintenance	varchar(20)
SoshibalCar	varchar(20)
ShortNameService	varchar(10) PK
ContractNumber	int PK

```
85
86  CREATE TABLE Service (
87  CarRental           VARCHAR(20) ,          -- ShortNameService = R
88  CarPlate            VARCHAR(12) ,          -- ShortNameService = P
89  CarMaintenance      VARCHAR(20) ,          -- ShortNameService = M
90  SoshibalCar         VARCHAR(20),           -- ShortNameService = S
91  ShortNameService    VARCHAR(10) NOT NULL ,
92  ContractNumber      INT(10)     NOT NULL ,
93  CONSTRAINT Service_PK PRIMARY KEY (ShortNameService , ContractNumber ),
94  CONSTRAINT Service_FK1 FOREIGN KEY (ContractNumber) REFERENCES Contract(ContractNumber)
95  ON DELETE CASCADE
96  ON UPDATE CASCADE
97  );
```

CREATE `GetsOn` table:

Table: getson

Columns:

CustomerID	int PK
ShortNameservice	varchar(15) PK
ContractNumber	int PK

```
99  CREATE TABLE GetsOn (
100 CustomerID          INT(10)       NOT NULL,
101 ShortNameservice    varchar(15)   NOT NULL ,
102 ContractNumber      INT(10)       NOT NULL ,
103 CONSTRAINT GetsOn_PK  PRIMARY KEY( CustomerID , ContractNumber , ShortNameservice ) ,
104 CONSTRAINT GetsOn_FK1 FOREIGN KEY (CustomerID)    REFERENCES Customer(CustomerID)
105 ON DELETE CASCADE
106 ON UPDATE CASCADE,
107 CONSTRAINT GetsOn_FK2 FOREIGN KEY (ShortNameservice) REFERENCES Service(ShortNameservice)
108 ON DELETE CASCADE
109 ON UPDATE CASCADE,
110 CONSTRAINT GetsOn_FK3 FOREIGN KEY (ContractNumber)   REFERENCES Contract(ContractNumber)
111 ON DELETE CASCADE
112 ON UPDATE CASCADE
113 );
```

CREATE `MultiColor` table:

Table: multicolor

Columns:

Color	varchar(30) PK
VIN	varchar(15) PK

```
120 CREATE TABLE MultiColor (
121 Color               VARCHAR(30) NOT NULL ,
122 VIN                 VARCHAR(15) NOT NULL ,
123 CONSTRAINT MultiColor_PK PRIMARY KEY (Color , VIN),
124 CONSTRAINT MultiColor_FK FOREIGN KEY (VIN) REFERENCES Product(VIN)
125 ON DELETE CASCADE
126 ON UPDATE CASCADE
127 );
```

CREATE `CustomerPhNumber` table:

Table: customerphnumber

Columns:

PhoneNumber	int PK
CustomerID	int PK

```
127
128 CREATE TABLE  CustomerPhNumber (
129 PhoneNumber         INT(10)     NOT NULL,
130 CustomerID          INT(10)                 UNIQUE,
131 CONSTRAINT CustomerPhNumber_PK PRIMARY KEY (PhoneNumber , CustomerID),
132 CONSTRAINT CustomerPhNumber_FK FOREIGN KEY (CustomerID) REFERENCES Customer(CustomerID)
133 ON DELETE CASCADE
134 ON UPDATE CASCADE
135 );
```

CREATE:

CREATE `EmploeeysPhNumber` table:

Table: emploeeysphnumber

Columns:

PhoneNumber	int PK
EmployeeID	int PK

```sql
CREATE TABLE  EmploeeysPhNumber (
PhoneNumber         INT(10)     NOT NULL,
EmployeeID          INT(10)     NOT NULL ,
CONSTRAINT EmploeeysPhNumber_PK PRIMARY KEY (PhoneNumber , EmployeeID),
CONSTRAINT EmploeeysPhNumber_FK FOREIGN KEY (EmployeeID) REFERENCES Employee(EmployeeID)
ON DELETE CASCADE
ON UPDATE CASCADE
);
```

CREATE `MultiTypeOfVehicles` table:

Table: multitypeofvehicles

Columns:

TypeOfVehicles	varchar(50) PK
VIN	varchar(15) PK

```sql
CREATE TABLE MultiTypeOfVehicles (
TypeOfVehicles      VARCHAR(50) NOT NULL,
VIN                 VARCHAR(15) NOT NULL ,
CONSTRAINT MultiTypeOfVehicles_PK  PRIMARY KEY ( TypeOfVehicles , VIN ) ,
CONSTRAINT MultiTypeOfVehicles_FK  FOREIGN KEY (VIN)  REFERENCES Product(VIN)
ON DELETE CASCADE
ON UPDATE CASCADE
);
```

CREATE `YearOfManufacturing` table:

Table: yearofmanufacturing

Columns:

YearOfManufacturing	int PK
Brand	varchar PK

```sql
CREATE TABLE YearOfManufacturing (
YearOfManufacturing     INT(4) NOT NULL ,
Brand               VARCHAR(20) NOT NULL ,
CONSTRAINT YearOfManufacturing_PK  PRIMARY KEY ( YearOfManufacturing , Brand ) ,
CONSTRAINT YearOfManufacturing_FK  FOREIGN KEY (Brand) REFERENCES Manufacture(Brand)
ON DELETE CASCADE
ON UPDATE CASCADE
);
```

INSERT

INSERT `Employee` table:

```sql
INSERT INTO Employee
VALUES
('Fahad' ,      'Ahmad' ,    1118743271 , 2025 , '96/2/15' ,'UMM AL-QURA' , 'Marketing' ,        2018 , 3 , 'Male' ,   8500 ),
('Sara' ,       'Ali' ,      1113456904 , 2026 , '98/6/11' ,'UMM AL-QURA' , 'Customer Service' , 2020 , 2 , 'Female' , 7500 ),
('Maha' ,       'Mohammed' , 1112378935 , 2024 , '95/9/1' , 'UMM AL-QURA' , 'Sales Manager' ,    2017 , 5 , 'Female' , 9900 ),
('lama' ,       'Naif',      1118735261 , 2029 , '94/5/3' , 'UMM AL-QURA' , 'Vendor' ,          2018 , 3 , 'Female' , 8500 ),
('Suha' ,       'Saud' ,     1191544286 , 2025 , '93/2/21' ,'UMM AL-QURA' , 'Accounting' ,      2016 , 6 , 'Female' , 11000 ),
('Mohammed' ,   'Saleh' ,    1153002716 , 2027 , '97/7/8' , 'UMM AL-QURA' , 'Vendor' ,          2019 , 4 , 'Male',    9000 ),
('Abdullrahman' , 'Naser' ,  1156398320 , 2028 , '92/11/1' ,'UMM AL-QURA' , 'Financial Manager' , 2015 , 8 , 'Male' ,   12000 );
SELECT * FROM Employee ;
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

FName	Lname	EmployeeID	IDexpiration	DateOfBirth	University	CurrentJob	GraduationYear	YearOfWork	Gender	Salary
Maha	Mohammed	1112378935	2024	1995-09-01	UMM AL-QURA	Sales Manager	2017	5	Female	9900
Sara	Ali	1113456904	2026	1998-06-11	UMM AL-QURA	Customer Service	2020	2	Female	7500
lama	Naif	1118735261	2029	1994-05-03	UMM AL-QURA	Vendor	2018	3	Female	8500
Fahad	Ahmad	1118743271	2025	1996-02-15	UMM AL-QURA	Marketing	2018	3	Male	8500
Mohammed	Saleh	1153002716	2027	1997-07-08	UMM AL-QURA	Vendor	2019	4	Male	9000
Abdullrahman	Naser	1156398320	2028	1992-11-01	UMM AL-QURA	Financial Manager	2015	8	Male	12000
Suha	Saud	1191544286	2025	1993-02-21	UMM AL-QURA	Accounting	2016	6	Female	11000
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

INSERT `Customer` table:

```sql
INSERT INTO Customer
VALUES
(1178064089 ,'Saudi', 2027 ,'Lama' ,   'Abdullah' , '04/3/15' , 'Women' , 'Saudi Arabia' , 65532 , 'Jeddah'),
(1165088032 ,'Saudi', 2024 ,'Naif' ,   'Rami' ,     '99/5/2' ,  'Man' ,   'Saudi Arabia' , 20339 , 'Makkah'),
(1125038094 ,'Saudi', 2030 ,'Hala',    'Ahmed' ,    '92/9/10' , 'Women' , 'Saudi Arabia' , 11506 , 'Makkah'),
(1194077350 ,'Saud',  2030 ,'Samar' ,  'Faisal' ,   '00/1/1' ,  'Women' , 'Saudi Arabia' , 64322 , 'Taif'),
(1178055034 ,'Saudi', 2025 ,'Faisal' , 'Abdullah' , '98/5/11' , 'Man' ,   'Saudi Arabia' , 54410 , 'Taif'),
(1133750122 ,'Saudi', 2028 ,'Omar' ,   'Ahmed' ,    '93/7/20' , 'Man' ,   'Saudi Arabia' , 60473 , 'Makkah');
SELECT * FROM Customer ;
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

CustomerID	Nationality	IDexpiration	FName	LName	DateOfBirth	Gender	Country	PostCode	City
1125038094	Saudi	2030	Hala	Ahmed	1992-09-10	Women	Saudi Arabia	11506	Makkah
1133750122	Saudi	2028	Omar	Ahmed	1993-07-20	Man	Saudi Arabia	60473	Makkah
1165088032	Saudi	2024	Naif	Rami	1999-05-02	Man	Saudi Arabia	20339	Makkah
1178055034	Saudi	2025	Faisal	Abdullah	1998-05-11	Man	Saudi Arabia	54410	Taif
1178064089	Saudi	2027	Lama	Abdullah	2004-03-15	Women	Saudi Arabia	65532	Jeddah
1194077350	Saud	2030	Samar	Faisal	2000-01-01	Women	Saudi Arabia	64322	Taif
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

INSERT `Contract` table:

```sql
INSERT INTO Contract
VALUES
(1722498015, '2015/8/11', 40000.70 , null,   null, 'A1234' ,  1118743271 , 1178064089),
(1968989006, '2006/9/18', 1205000,   null,   null, 'E5678' ,  1113456904 , 1133750122),
(1648989089, '1989/4/30', null,      204500, null, 'I012' ,   1112378935 , 1125038094),
(1478743005, '2005/5/28', null,      null,   79000, 'M3456' , 1118735261 , 1194077350),
(1932843002, '2002/3/25', 1001900,   null,   null, 'Q7890',   1156398320 , 1178055034);
SELECT * FROM Contract ;
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

ContractNumber	Date	FullBatch	HallfBatch	Installment	VIN	EmployeeID	CustomerID
1478743005	2005-05-28	NULL	NULL	79000	M3456	1118735261	1194077350
1648989089	1989-04-30	NULL	204500	NULL	I012	1112378935	1125038094
1722498015	2015-08-11	40001	NULL	NULL	A1234	1118743271	1178064089
1932843002	2002-03-25	1001900	NULL	NULL	Q7890	1156398320	1178055034
1968989006	2006-09-18	1205000	NULL	NULL	E5678	1113456904	1133750122
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

INSERT:

INSERT `Product` table:

```
186 •   INSERT INTO Product
187     VALUES
188     ('A1234', 100.00),
189     ('E5678', 250.50),
190     ('I012', 500.00),
191     ('M3456', 75.25),
192     ('Q7890', 999.99);
193 •   SELECT * FROM Product ;
```

Result Grid | Filter Rows:

VIN	Price
A1234	100.00
E5678	250.50
I012	500.00
M3456	75.25
Q7890	999.99
NULL	NULL

INSERT `Produces` table:

```
218 •   INSERT INTO Produces
219     VALUES
220     ('BMW' ,      'A1234'),
221     ('mercedes' , 'E5678'),
222     ('hyundai' ,  'I012'),
223     ('GMC' ,      'M3456'),
224     ('genesis' ,  'Q7890');
225 •   SELECT * FROM Produces ;
226
```

Result Grid | Filter Rows:

Brand	VIN
BMW	A1234
mercedes	E5678
hyundai	I012
GMC	M3456
genesis	Q7890
NULL	NULL

INSERT `MultiColor` table:

```
245 •   INSERT INTO MultiColor
246     VALUES
247     ('Grey',  'A1234'),
248     ('Red' ,  'E5678'),
249     ('Blue',  'I012'),
250     ('White', 'M3456'),
251     ('Black', 'Q7890');
252 •   SELECT * FROM MultiColor ;
253
```

Result Grid | Filter Rows: | Edit

Color	VIN
Grey	A1234
Red	E5678
Blue	I012
White	M3456
Black	Q7890
NULL	NULL

INSERT `Manufacture` table:

```
207 •   INSERT INTO Manufacture
208     VALUES
209     ('BMW',      'Germany'),
210     ('Mercedes', 'Germany'),
211     ('Hyundai',  'South Korea'),
212     ('GMC',      'America'),
213     ('Genesis',  'Korea'),
214     ('mazda',    'Japan'),
215     ('Bently',   'England');
216 •   SELECT * FROM Manufacture ;
217
```

Result Grid | Filter Rows: | Edit:

Brand	Country
Bently	England
BMW	Germany
Genesis	Korea
GMC	America
Hyundai	South Korea
mazda	Japan
Mercedes	Germany
NULL	NULL

INSERT:

INSERT `Service` table:

```
227 •   INSERT INTO Service
228     VALUES
229     ('Yes', 'ABC123', 'Yes', 'No',  'R , P , M', 1968989006),
230     ('No',  'DEF456', 'No',  'Yes', 'P , S'    , 1648989089),
231     ('Yes', 'GHI789', 'Yes', 'No',  'R , P , M', 1478743005),
232     ('No',  'JKL012', 'No',  'Yes', 'P , S'    , 1932843002),
233     ('Yes', 'MNO345', 'Yes', 'No',  'R , P , M', 1722498015);
234 •   SELECT * FROM Service ;
235
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Co

CarRental	CarPlate	CarMaintenance	SoshibalCar	ShortNameService	ContractNumber
No	DEF456	No	Yes	P , S	1648989089
No	JKL012	No	Yes	P , S	1932843002
Yes	GHI789	Yes	No	R , P , M	1478743005
Yes	MNO345	Yes	No	R , P , M	1722498015
Yes	ABC123	Yes	No	R , P , M	1968989006
NULL	NULL	NULL	NULL	NULL	NULL

INSERT `CustomerPhNumber` table:

```
254 •   INSERT INTO CustomerPhNumber
255     VALUES
256     (0561134537, 1125038094),
257     (0579891205, 1165088032),
258     (0555342379, 1178055034),
259     (0513409754, 1178064089),
260     (0598564321, 1194077350);
261 •   SELECT * FROM CustomerPhNumber ;
262
```

Result Grid | Filter Rows: | Edit:

PhoneNumber	CustomerID
561134537	1125038094
579891205	1165088032
555342379	1178055034
513409754	1178064089
598564321	1194077350
NULL	NULL

INSERT:

INSERT `YearOfManufacturing` table:

```
281 •   INSERT INTO YearOfManufacturing
282     VALUES
283     (2011 , 'BMW'),
284     (1999 , 'mercedes'),
285     (2021 , 'hyundai'),
286     (2016 , 'GMC'),
287     (2015 , 'genesis'),
288     (2023 , 'mazda'),
289     (2015 , 'bently');
290 •   SELECT * FROM YearOfManufacturing ;
```

Result Grid | Filter Rows: | Edit: | Export

YearOfManufacturing	Brand
2015	bently
2011	BMW
2015	genesis
2016	GMC
2021	hyundai
2023	mazda
1999	mercedes
NULL	NULL

INSERT `EmploeeysPhNumber` table:

```
263 •   INSERT INTO EmploeeysPhNumber
264     VALUES
265     (0561566453, 1118743271),
266     (0549003205, 1113456904),
267     (0550328879, 1112378935),
268     (0506094354, 1118735261),
269     (0506839221, 1191544286);
270 •   SELECT * FROM EmploeeysPhNumber ;
271
```

Result Grid | Filter Rows: | Edit:

PhoneNumber	EmployeeID
550328879	1112378935
549003205	1113456904
506094354	1118735261
561566453	1118743271
506839221	1191544286
NULL	NULL

INSERT:

INSERT `MultiTypeOfVehicle` table:

```
263 •   INSERT INTO multitypeofvehicles
264     VALUES
265     ('SUV' ,       'M3456'),
266     ('Sedan' ,     'I012'),
267     ('Supercar' ,  'I012'),
268     ('Hatchback' , 'A1234'),
269     ('Sedan' ,     'Q7890'),
270     ('Supercar' ,  'E5678');
271 •   SELECT *
272     FROM carshow.multitypeofvehicles;
```

Result Grid | Filter Rows:

TypeOfVehicles	VIN
Hatchback	A1234
Supercar	E5678
Sedan	I012
Supercar	I012
SUV	M3456
Sedan	Q7890
NULL	NULL

INSERT `GetsOn` table:

```
228 •   INSERT INTO GetsOn
229     VALUES
230     (1178064089 , 'R , P , M' , 1968989006),
231     (1165088032 , 'P , S'     , 1648989089),
232     (1125038094 , 'R , P , M' , 1478743005),
233     (1194077350 , 'P , S'     , 1932843002),
234     (1178055034 , 'R , P , M' , 1722498015);
235 •   SELECT * FROM carshow.getson ;
```

Result Grid | Filter Rows: | Edit:

CustomerID	ShortNameservice	ContractNumber
1125038094	R , P , M	1478743005
1178055034	R , P , M	1722498015
1194077350	P , S	1932843002
1178064089	R , P , M	1968989006
NULL	NULL	NULL

QUERIES:

UPDATE

```
308 •   UPDATE Product
309     SET Price = 299.99
310     WHERE VIN = 'E5678';
311 •   SELECT * FROM Product ;
```

BEFORE

	VIN	Price
▶	A1234	100.00
	E5678	250.50
	I012	500.00
	M3456	75.25
	Q7890	999.99
*	NULL	NULL

AFTER

	VIN	Price
▶	A1234	100.00
	E5678	299.99
	I012	500.00
	M3456	75.25
	Q7890	999.99
*	NULL	NULL

```
359 •   UPDATE EmploeeysPhNumber
360     SET PhoneNumber = 0530704098
361     WHERE EmployeeID = 1113456904;
362 •   SELECT * FROM EmploeeysPhNumber ;
```

BEFORE

	PhoneNumber	EmployeeID
▶	550328879	1112378935
	549003205	1113456904
	506094354	1118735261
	561566453	1118743271
	506839221	1191544286
*	NULL	NULL

AFTER

	PhoneNumber	EmployeeID
▶	550328879	1112378935
	530704098	1113456904
	506094354	1118735261
	561566453	1118743271
	506839221	1191544286
*	NULL	NULL

QUERIES:

DELETE

```
323 •    DELETE FROM Produces
324      WHERE  Brand='GMC';
325 •    SELECT * FROM Produces ;
```

BEFORE

	Brand	VIN
▶	BMW	A1234
	mercedes	E5678
	hyundai	I012
	GMC	M3456
	genesis	Q7890

AFTER

	Brand	VIN
▶	BMW	A1234
	mercedes	E5678
	hyundai	I012
	genesis	Q7890
*	NULL	NULL

```
303 •   DELETE FROM Customer
304         WHERE CustomerID = 1165088032;
305 •       SELECT * FROM Customer ;
```

BEFORE

CustomerID	Nationality	IDexpiration	FName	LName	DateOfBirth	Gender	Country	PostCode	City
1125038094	Saudi	2030	Hala	Ahmed	1992-09-10	Women	Saudi Arabia	11506	Makkah
1133750122	Saudi	2028	Omar	Ahmed	1993-07-20	Man	Saudi Arabia	60473	Makkah
1165088032	Saudi	2024	Naif	Rami	1999-05-02	Man	Saudi Arabia	20339	Makkah
1178055034	Saudi	2025	Faisal	Abdullah	1998-05-11	Man	Saudi Arabia	54410	Taif
1178064089	Saudi	2027	Lama	Abdullah	2004-03-15	Women	Saudi Arabia	65532	Jeddah
1194077350	Saud	2030	Samar	Faisal	2000-01-01	Women	Saudi Arabia	64322	Taif

AFTER

CustomerID	Nationality	IDexpiration	FName	LName	DateOfBirth	Gender	Country	PostCode	City
1125038094	Saudi	2030	Hala	Ahmed	1992-09-10	Women	Saudi Arabia	11506	Makkah
1133750122	Saudi	2028	Omar	Ahmed	1993-07-20	Man	Saudi Arabia	60473	Makkah
1178055034	Saudi	2025	Faisal	Abdullah	1998-05-11	Man	Saudi Arabia	54410	Taif
1178064089	Saudi	2027	Lama	Abdullah	2004-03-15	Women	Saudi Arabia	65532	Jeddah
1194077350	Saud	2030	Samar	Faisal	2000-01-01	Women	Saudi Arabia	64322	Taif
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

QUERIES:

HAVING + GROUP BY

```
297 •   SELECT Gender, count(FName)
298     FROM Employee
299     GROUP BY Gender
300     HAVING count(FName) > 2;
```

	Gender	count(FName)
▶	Female	4
	Male	3

```
314 •   SELECT ContractNumber , CustomerID , Count(*)
315     FROM Contract
316     GROUP BY ContractNumber , CustomerID ;
```

	ContractNumber	CustomerID	Count(*)
▶	1648989089	1125038094	1
	1968989006	1133750122	1
	1932843002	1178055034	1
	1722498015	1178064089	1
	1478743005	1194077350	1

QUERIES:

Join operations

```sql
-- Service  [JOIN]
-- SQL query that performs a join operation between the Service and Product tables
-- It selects the shortNameService and ContractNumber columns from the Service table
-- and the VIN and Price columns from the Product table
SELECT S.shortNameService, S.ContractNumber, P.VIN, P.Price
FROM Service S JOIN Contract C ON S.ContractNumber = C.ContractNumber
JOIN Product P ON C.VIN = P.VIN;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

shortNameService	ContractNumber	VIN	Price
R , P , M	1478743005	M3456	75.25
P , S	1648989089	I012	500.00
R , P , M	1722498015	A1234	100.00
P , S	1932843002	Q7890	999.99
R , P , M	1968989006	E5678	299.99

```sql
-- MultiTypeOfVehicles  [INNER JOIN]
SELECT product.VIN, product.Price, multitypeofvehicles.TypeOfVehicles
FROM product
INNER JOIN multitypeofvehicles
ON product.VIN = multitypeofvehicles.VIN;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

VIN	Price	TypeOfVehicles
A1234	100.00	Hatchback
E5678	299.99	Supercar
I012	500.00	Sedan
I012	500.00	Supercar
M3456	75.25	SUV
Q7890	999.99	Sedan

WHERE

```sql
-- GetsOn  [WHERE]
SELECT ContractNumber
FROM GetsOn
WHERE CustomerID = 1178064089 ;
```

Result Grid | Filter Rows: | Ex

ContractNumber
1968989006

QUERIES:

Subqueries

```
354 •   SELECT *
355     FROM CustomerPhNumber
356     WHERE CustomerID IN (SELECT CustomerID FROM Customer WHERE City = 'Jeddah');
357
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Cont

PhoneNumber	CustomerID
513409754	1178064089
NULL	NULL

```
374     -- YearOfManufacturing  [LEFT JOIN + WHERE + ORDER BY]
375 •   SELECT M.Brand, YM.YearOfManufacturing, M.Country
376     FROM Manufacture AS M
377     LEFT JOIN YearOfManufacturing AS YM
378     ON M.Brand = YM.Brand WHERE YM.YearOfManufacturing >= 2015
379     ORDER BY YM.YearOfManufacturing ASC;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Brand	YearOfManufacturing	Country
Bently	2015	England
Genesis	2015	Korea
GMC	2016	America
Hyundai	2021	South Korea
mazda	2023	Japan

QUERIES:

ORDER BY

```
319 •    SELECT Brand FROM Manufacture
320          ORDER BY Brand ASC;
```

	Brand
▶	Bently
	BMW
	Genesis
	GMC
	Hyundai
	mazda
	Mercedes
*	NULL

```
345 •    SELECT *
346      FROM MultiColor
347      ORDER BY Color ASC;
```

	Color	VIN
▶	Black	Q7890
	Blue	I012
	Grey	A1234
	Red	E5678
	White	M3456
*	NULL	NULL

```
327 •    SELECT *
328      FROM Produces
329      ORDER BY VIN DESC;
```

	Brand	VIN
▶	genesis	Q7890
	hyundai	I012
	mercedes	E5678
	BMW	A1234
*	NULL	NULL

QUERIES:

ORDER BY

```
350 •    SELECT *
351      FROM CustomerPhNumber
352      ORDER BY PhoneNumber DESC;
```

	PhoneNumber	CustomerID
▶	598564321	1194077350
	561134537	1125038094
	555342379	1178055034
	513409754	1178064089
*	NULL	NULL

```
364 •    SELECT *
365      FROM EmploeeysPhNumber
366      ORDER BY PhoneNumber ASC;
```

	PhoneNumber	EmployeeID
▶	506094354	1118735261
	506839221	1191544286
	530704098	1113456904
	550328879	1112378935
	561566453	1118743271
*	NULL	NULL