



# **DATABASE MANAGEMENT SYSTEM**

**Group-1**

**Car Shopping Website Database**

# GROUP MEMBERS



Kerem Düz

Furkan Tosun

Ahmet Melih Bostancieri

Egemen Çamözü

Yunus Emre Balcı

# About Us

We are a team of students who developed a database and user interface for online car sales. Our project includes inventory tracking, order management, and customer analytics to create a seamless buying experience. We built this platform to make car shopping simpler and more efficient.



# WHY WE DID THIS FOR

If you have a physical and online store selling cars and want to easily and securely store your data, we have designed this database for you



# **MISSION STATEMENT**

**Our mission is to redefine automotive retail by offering a fast, reliable, and adaptable database platform for managing sales information**



## **WHY SHOULD YOU INVEST THIS PROJECT**

In today's digital landscape, leading companies rely on online platforms to market and sell their products. If your business is facing challenges in storing and managing critical project data efficiently, investing in our solution is the key to seamless scalability and performance.



# Fact Finding Techniques

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**Research**



**OBSERVING**

# TASKS GIVEN TO US

1

1. An unnormalized set  
of data

2

2.E-R Diagram for our  
3NF database

3

3. SQL queries for  
creating tables and  
inserting data from the  
UNF database table into  
the tables created

4

4. An User Interface

# 1. An unnormalized set of data

carInfo	dimensions	bodyStyle	brand	productDetails
golf mk8 manuel hybrid 1.4 TSI 241	4 1300 240 381	1 hatchback	1 volkswagen das auto	1 full 50000.00 400
golf mk8 manuel hybrid 1.4 TSI 241	4 1300 240 381	1 hatchback	1 volkswagen das auto	1 full 50000.00 400
golf mk8 manuel hybrid 1.4 TSI 241	4 1300 240 381	1 hatchback	1 volkswagen das auto	2 empty 40000.00 200
amg c63 automatic gasoline 2.0 FSI 469	4 1700 300 450	2 sedan	2 mercedes the best or nothing	3 full 100000.00 100
amg c63 automatic gasoline 2.0 FSI 469	4 1700 300 450	2 sedan	2 mercedes the best or nothing	4 full 100000.00 200
a8 automatic diesel 3.0 TDI 286	4 1830 250 500	2 sedan	3 audi progress through technology	5 full 120000.00 50
a8 automatic diesel 3.0 TDI 286	4 1830 250 500	2 sedan	3 audi progress through technology	6 empty 110000.00 100
passat highline automatic gasoline 1.6 TDI 200	4 1400 230 400	2 sedan	1 volkswagen das auto	7 full 40000.00 500
colorInfo	customerInfo	contactInfo	orderInfo	commentInfo
1 white standard	1 Quinn McLightning quinn@gmail.com 2006-09-15	sshashed123 1233218934 berkeley california	1 2021-01-19 completed 1	1 cool car 5 2021-02-24
1 white standard	2 Sal Vulcano salvulcano@gmail.com 1976-11-06	nevergonnafindit 4325667145 rhode island main street	2 2021-02-07 completed 1	2 big fan 5 2021-03-05
2 black matte	3 Greg Davies gdavies@gmail.com 1970-11-04	pwpw1332 3314671241 leicester	3 2021-05-21 completed 1	3 couldnt fit in it innit 2 2021-07-07
3 grey metallic	4 stefan burnett ridegrips@gmail.com 1980-05-08	123noided123 1541645523 sacramento	4 2021-06-25 completed 1	4 disappointed. no love. 1 2021-10-11
5 black glossy	5 seher oguz seher@gmail.com 1963-04-05	pizza53 1512653467 kultur street	5 2021-09-12 completed 1	5 super cool 5 2021-10-11
6 white pearl	6 muhittin bug muho07@hotmail.com 1962-04-07	baskanolucam123 5324642312 antalya white house	6 2022-01-01 completed 1	6 oy kullanmayi unutmayin 4 2022-03-05
3 grey metallic	7 dick cheney dcheney@gmail.com 1955-05-07	sdgdaasdqw 1246452343 nebraska	7 2022-03-07 completed 1	7 went to iraq with this 10/10 5 2022-07-07
4 blue metallic	8 shane gillis shanegillis@gmail.com 1980-07-09	shaneshaneshane 2464568375 10th street pennsylvania	8 2024-03-03 being shipped 1	

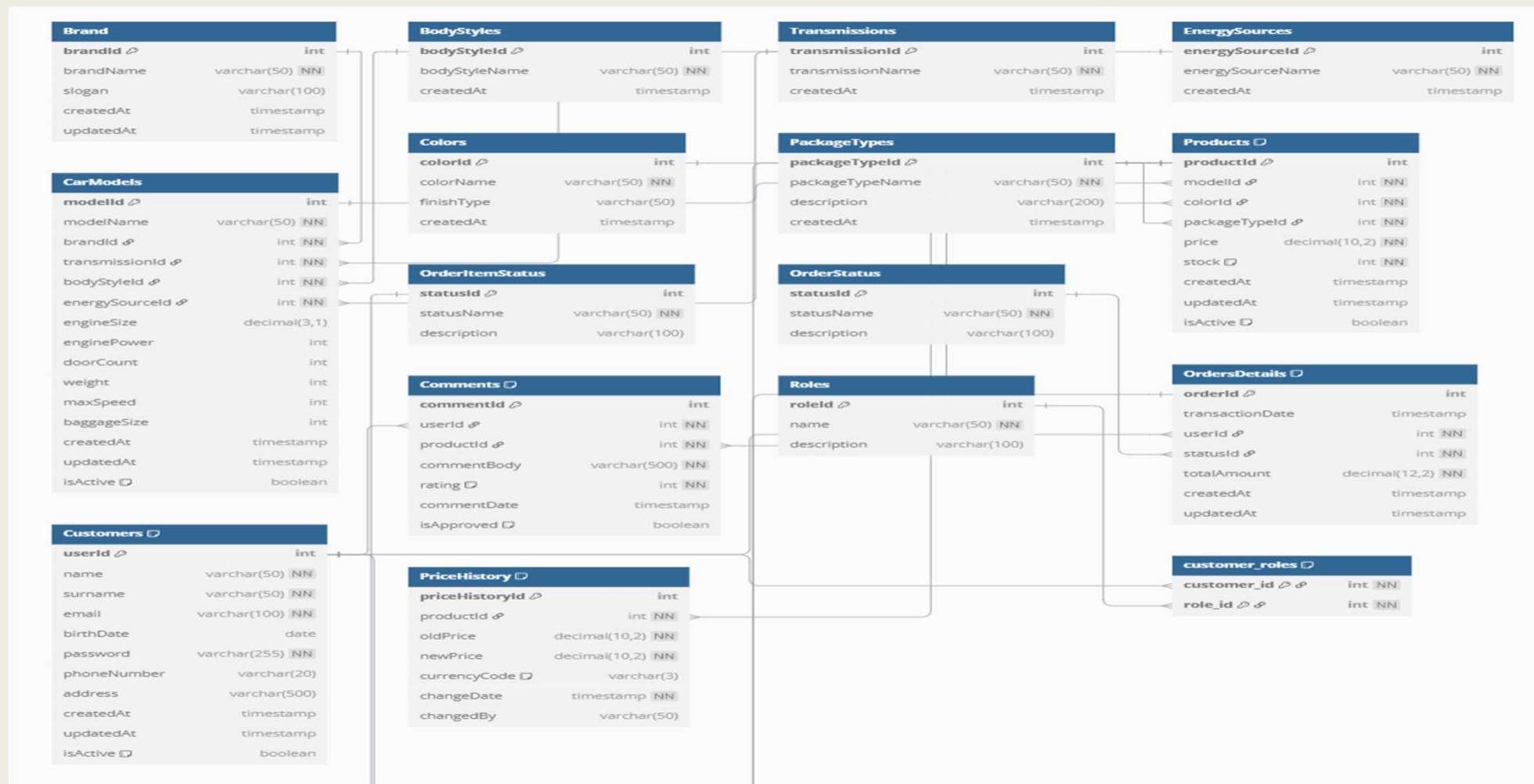
# NORMALIZATION PROCESS

carInfo	dimensions	bodyStyle	brand	productDetails
golf mk8 manuel hybrid 1.4 TSI 241	4 1300 240 381	1 hatchback	1 volkswagen das auto	1 full 50000.00 400
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colorInfo	customerInfo	contactInfo	orderInfo	commentInfo
1 white standard	1 Quinn McLightning quinn@gmail.com 2006-09-15	sshashed123 123321893 berkeley california	1 2021-01-11 completed 1	1 cool car 5 2021-02-24
1 white standard	2 Sal Vulcano salvulcano@gmail.com 1976-11-06	nevergonnafindit 4325667145 rhode island main street	2 2021-02-01 completed 1	2 big fan 5 2021-03-05
2 black matte	3 Greg Davies gdavies@gmail.com 1970-11-04	pwpw1337 3314671241 leicester	3 2021-05-23 completed 1	3 couldnt fit in it innit 2 2021-07-07
3 grey metallic	4 stefan Burnett ridegrips@gmail.com 1980-05-08	123noidea123 1541645523 sacramento	4 2021-06-25 completed 1	4 disappointed. no love. 1 2021-10-11
5 black glossy	5 seher oguz seher@gmail.com 1963-04-05	pizza55 1512653467 kultur street	5 2021-09-12 completed 1	5 super cool 5 2021-10-11
6 white pearl	6 muhittin bug muho07@hotmail.com 1962-04-07	baskanolucam12 5324642312 antalya white house	6 2022-01-01 completed 1	6 boy kullanmayi unutmayin 4 2022-03-05
3 grey metallic	7 dicit Cheney dcheney@gmail.com 1955-05-07	sdgdaasdwc 124645234 nebraska	7 2022-03-07 completed 1	7 went to iraq with this 10/10 5 2022-07-07
4 blue metallic	8 shane Gillis shanegillis@gmail.com 1980-07-09	shaneshaneshane 246456837 10th street pennsylvania	8 2024-03-03 being shipped 1	

# NORMALIZATION PROCESS

carInfo	dimensions	bodyStyle	brand	productDetails
golf mk8 manuel hybrid 1.4 TSI 241	4 1300 240 381	1 hatchback	1 volkswagen das auto	1 full 50000.00 400
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4 blue metallic	8 shane gillis shanegillis@gmail.com 1980-07-09	shaneshaneshane 2464568375 10th street pennsylvania	8 2024-03-03 being shipped 1	

# NORMALIZATION PROCESS



## CREATING UNF TABLE

```
1   CREATE TABLE unf (
2       carInfo TEXT,
3       dimensions TEXT,
4       bodyStyle TEXT,
5       brand TEXT,
6       productDetails TEXT,
7       colorInfo TEXT,
8       customerInfo TEXT,
9       contactInfo TEXT,
10      orderInfo TEXT,
11      commentInfo TEXT
12  );
```

## SQL query for inserting data to the UNF database table.

```
1  INSERT INTO unf (carInfo, dimensions, bodyStyle, brand, productDetails, colorInfo,
2    customerInfo, contactInfo, orderInfo, commentInfo) VALUES
3    ('golf mk8|manuel|hybrid|1.4 TSI|241', '4|1300|240|381', '1|hatchback',
4    '1|volkswagen|das auto', '1|full|50000.00|400', '1|white|standard',
5    '1|Quinn|McLightning|quinn@gmail.com|2006-09-15',
6    'sashashed123|1233218994|berkeley california', '1|2021-01-19|completed|1', '1|cool car|5|2021-02-24')
7
```

Before the 4th task we should create the 3NF tables

- CREATE TABLE Brand (  
brandId INT PRIMARY KEY AUTO\_INCREMENT,  
brandName VARCHAR(50) NOT NULL,  
slogan VARCHAR(100),  
createdAt TIMESTAMP DEFAULT CURRENT\_TIMESTAMP,  
updatedAt TIMESTAMP DEFAULT CURRENT\_TIMESTAMP ON UPDATE CURRENT\_TIMESTAMP  
) DEFAULT CHARACTER SET utf8mb4 COLLATE utf8mb4\_unicode\_ci;

	brandId	brandName	slogan	createdAt	updatedAt
*	NULL	NULL	NULL	NULL	NULL

# Creating CarModel Table

```
CREATE TABLE CarModels (
    modelId INT PRIMARY KEY AUTO_INCREMENT,
    modelName VARCHAR(50) NOT NULL,
    brandId INT NOT NULL,
    transmissionId INT NOT NULL,
    bodyStyleId INT NOT NULL,
    energySourceId INT NOT NULL,
    engineSize DECIMAL(3,1),
    enginePower INT,
    doorCount INT,
    weight INT,
    maxSpeed INT,
    baggageSize INT,
    createdAt TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
    updatedAt TIMESTAMP DEFAULT CURRENT_TIMESTAMP ON UPDATE CURRENT_TIMESTAMP,
    isActive BOOLEAN DEFAULT TRUE,
    FOREIGN KEY (brandId) REFERENCES Brand(brandId) ON DELETE RESTRICT,
    FOREIGN KEY (transmissionId) REFERENCES Transmissions(transmissionId) ON DELETE RESTRICT,
    FOREIGN KEY (bodyStyleId) REFERENCES BodyStyles(bodyStyleId) ON DELETE RESTRICT,
    FOREIGN KEY (energySourceId) REFERENCES EnergySources(energySourceId) ON DELETE RESTRICT
) DEFAULT CHARACTER SET utf8mb4 COLLATE utf8mb4_unicode_ci;
```

## CREATING PRODUCT TABLE

```
• CREATE TABLE Products (
    productId INT PRIMARY KEY AUTO_INCREMENT,
    modelId INT NOT NULL,
    colorId INT NOT NULL,
    packageTypeId INT NOT NULL,
    price DECIMAL(10,2) NOT NULL,
    stock INT NOT NULL DEFAULT 0,
    createdAt TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
    updatedAt TIMESTAMP DEFAULT CURRENT_TIMESTAMP ON UPDATE CURRENT_TIMESTAMP,
    isActive BOOLEAN DEFAULT TRUE,
    FOREIGN KEY (modelId) REFERENCES CarModels(modelId) ON DELETE RESTRICT,
    FOREIGN KEY (colorId) REFERENCES Colors(colorId) ON DELETE RESTRICT,
    FOREIGN KEY (packageTypeId) REFERENCES PackageTypes(packageTypeId) ON DELETE RESTRICT,
    INDEX idx_product_model (modelId),
    INDEX idx_product_color (colorId)
) DEFAULT CHARACTER SET utf8mb4 COLLATE utf8mb4_unicode_ci;
```

# CUSTOMER TABLE

```
CREATE TABLE Customers (
    userId INT PRIMARY KEY AUTO_INCREMENT,
    name VARCHAR(50) NOT NULL,
    surname VARCHAR(50) NOT NULL,
    email VARCHAR(100) UNIQUE NOT NULL,
    birthDate DATE,
    password VARCHAR(255) NOT NULL,
    phoneNumber VARCHAR(20),
    address VARCHAR(500),
    createdAt TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
    updatedAt TIMESTAMP DEFAULT CURRENT_TIMESTAMP ON UPDATE CURRENT_TIMESTAMP,
    isActive BOOLEAN DEFAULT TRUE,
    INDEX idx_customer_email (email)
) DEFAULT CHARACTER SET utf8mb4 COLLATE utf8mb4_unicode_ci;
```

## ORDERDETAILS TABLE

```
CREATE TABLE OrdersDetails (
    orderId INT PRIMARY KEY AUTO_INCREMENT,
    transactionDate TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
    userId INT NOT NULL,
    statusId INT NOT NULL,
    totalAmount DECIMAL(12,2) NOT NULL,
    createdAt TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
    updatedAt TIMESTAMP DEFAULT CURRENT_TIMESTAMP ON UPDATE CURRENT_TIMESTAMP,
    FOREIGN KEY (userId) REFERENCES Customers(userId) ON DELETE RESTRICT,
    FOREIGN KEY (statusId) REFERENCES OrderStatus(statusId) ON DELETE RESTRICT,
    INDEX idx_order_user (userId),
    INDEX idx_order_status (statusId)
) DEFAULT CHARACTER SET utf8mb4 COLLATE utf8mb4_unicode_ci;
```

## ORDERITEMS TABLE

```
▶ Ⓜ CREATE TABLE OrdersItems (
    orderItemId INT PRIMARY KEY AUTO_INCREMENT,
    orderId INT NOT NULL,
    productId INT NOT NULL,
    quantity INT NOT NULL DEFAULT 1,
    unitPrice DECIMAL(10,2) NOT NULL,
    totalPrice DECIMAL(10,2) NOT NULL,
    itemStatusId INT NOT NULL DEFAULT 1, -- Varsayılan: Pending
    createdAt TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
    FOREIGN KEY (orderId) REFERENCES OrdersDetails(orderId) ON DELETE CASCADE,
    FOREIGN KEY (productId) REFERENCES Products(productId) ON DELETE RESTRICT,
    FOREIGN KEY (itemStatusId) REFERENCES OrderItemStatus(statusId) ON DELETE RESTRICT,
    CONSTRAINT unique_order_product UNIQUE (orderId, productId),
    INDEX idx_orderitem_order (orderId),
    INDEX idx_orderitem_product (productId),
    INDEX idx_orderitem_status (itemStatusId)
) DEFAULT CHARACTER SET utf8mb4 COLLATE utf8mb4_unicode_ci;
```

## COMMENTS TABLE

```
• CREATE TABLE Comments (
    commentId INT PRIMARY KEY AUTO_INCREMENT,
    userId INT NOT NULL,
    productId INT NOT NULL,
    commentBody VARCHAR(500) NOT NULL,
    rating INT NOT NULL,
    commentDate TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
    isApproved BOOLEAN DEFAULT FALSE,
    FOREIGN KEY (userId) REFERENCES Customers(userId) ON DELETE CASCADE,
    FOREIGN KEY (productId) REFERENCES Products(productId) ON DELETE CASCADE,
    INDEX idx_comment_product (productId),
    INDEX idx_comment_user (userId),
    CONSTRAINT check_rating CHECK (rating BETWEEN 1 AND 5)
) DEFAULT CHARACTER SET utf8mb4 COLLATE utf8mb4_unicode_ci;
```

# Inserting data from the unf table into the 3NF tables

```
-- MARKA BİLGİSİ
INSERT INTO brand (brand_id, brand_name, slogan)
SELECT DISTINCT
    SUBSTRING_INDEX(brand, '|', 1),
    SUBSTRING_INDEX(SUBSTRING_INDEX(brand, '|', 2), '|', -1),
    SUBSTRING_INDEX(brand, '|', -1)
FROM unf;

-- KAROSER TİPİ
INSERT INTO bodystyles (body_style_id, style_name)
SELECT DISTINCT
    bodyStyle, bodyStyle
FROM unf;

-- VİTES TÜRÜ
INSERT INTO transmissions (transmission_id, transmission_name)
SELECT DISTINCT
    SUBSTRING_INDEX(SUBSTRING_INDEX(carInfo, '|', 2), '|', -1),
    SUBSTRING_INDEX(SUBSTRING_INDEX(carInfo, '|', 2), '|', -1)
FROM unf;

-- ENERJİ KAYNAĞI
INSERT INTO energysources (energy_source_id, source_name)
SELECT DISTINCT
    SUBSTRING_INDEX(SUBSTRING_INDEX(carInfo, '|', 3), '|', -1),
    SUBSTRING_INDEX(SUBSTRING_INDEX(carInfo, '|', 3), '|', -1)
FROM unf;

-- ARABA MODELLERİ
INSERT INTO carmodels (
    model_id, model_name, transmission_id, energy_source_id, engine_size, horsepower,
    body_style_id, door_count, weight, max_speed, baggage_size, brand_id
)
SELECT DISTINCT
```

```
-- ÜRÜNLER
INSERT INTO products (product_id, model_id, color, package_type, price, stock)
SELECT DISTINCT
    SUBSTRING_INDEX(SUBSTRING_INDEX(productDetails, '|', 3), '|', -1),
    SUBSTRING_INDEX(SUBSTRING_INDEX(carInfo, '|', 4), '|', -1),
    SUBSTRING_INDEX(SUBSTRING_INDEX(colorInfo, '|', 1), '|', -1),
    SUBSTRING_INDEX(SUBSTRING_INDEX(productDetails, '|', 2), '|', -1),
    REPLACE(SUBSTRING_INDEX(SUBSTRING_INDEX(productDetails, '|', 2), '|', -1), '|', ''),
    SUBSTRING_INDEX(productDetails, '|', -1)
FROM unf;
```

#### -- MÜŞTERİLER

```
INSERT INTO customers (user_id, name, surname, email, birthdate)
SELECT DISTINCT
    SUBSTRING_INDEX(SUBSTRING_INDEX(customerInfo, '|', 1), '|', -1),
    SUBSTRING_INDEX(SUBSTRING_INDEX(customerInfo, '|', 2), '|', -1),
    SUBSTRING_INDEX(SUBSTRING_INDEX(customerInfo, '|', 3), '|', -1),
    SUBSTRING_INDEX(SUBSTRING_INDEX(customerInfo, '|', 4), '|', -1),
    SUBSTRING_INDEX(customerInfo, '|', -1)
FROM unf;
```

#### -- İLETİŞİM BİLGİSİ

```
INSERT INTO contactinfo (user_id, password, phone, address)
SELECT DISTINCT
    SUBSTRING_INDEX(SUBSTRING_INDEX(customerInfo, '|', 1), '|', -1),
    SUBSTRING_INDEX(SUBSTRING_INDEX(contactInfo, '|', 1), '|', -1),
    SUBSTRING_INDEX(SUBSTRING_INDEX(contactInfo, '|', 2), '|', -1),
    SUBSTRING_INDEX(contactInfo, '|', -1)
FROM unf;
```

#### -- SİPARİŞ

```
INSERT INTO orderdetails (order_id, user_id, order_date, status_id)
SELECT DISTINCT
    SUBSTRING_INDEX(SUBSTRING_INDEX(orderInfo, '|', 1), '|', -1),
    SUBSTRING_INDEX(SUBSTRING_INDEX(customerInfo, '|', 1), '|', -1),
    SUBSTRING_INDEX(SUBSTRING_INDEX(orderInfo, '|', 2), '|', -1),
    SUBSTRING_INDEX(orderInfo, '|', -1)
FROM unf;
```

```
-- İLETİŞİM BİLGİSİ
INSERT INTO contactinfo (user_id, password, phone, address)
SELECT DISTINCT
    SUBSTRING_INDEX(SUBSTRING_INDEX(customerInfo, '|', 1), '|', -1),
    SUBSTRING_INDEX(SUBSTRING_INDEX(contactInfo, '|', 1), '|', -1),
    SUBSTRING_INDEX(SUBSTRING_INDEX(contactInfo, '|', 2), '|', -1),
    SUBSTRING_INDEX(contactInfo, '|', -1)
FROM unf;

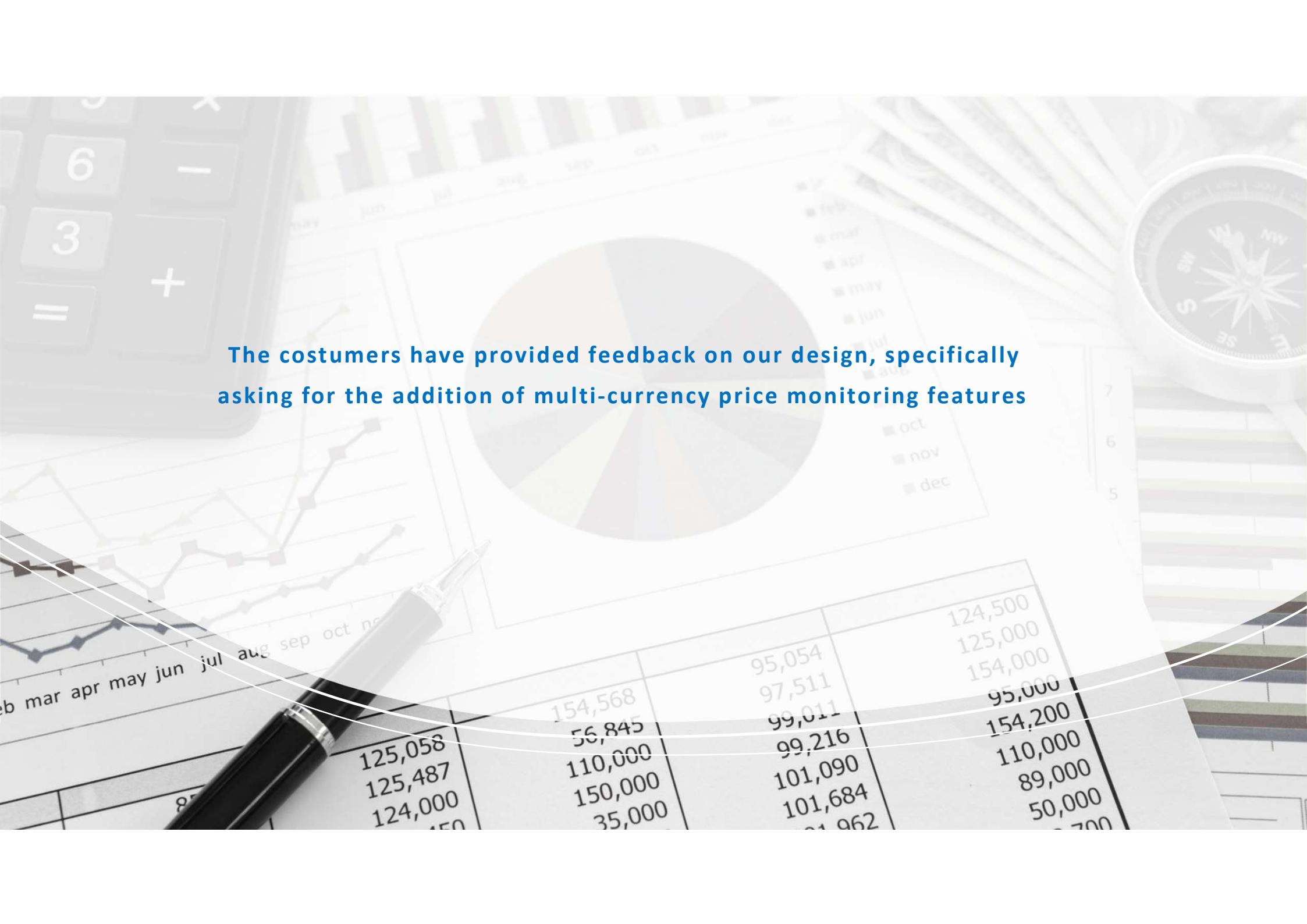
-- SİPARİŞ
INSERT INTO orderdetails (order_id, user_id, order_date, status_id)
SELECT DISTINCT
    SUBSTRING_INDEX(SUBSTRING_INDEX(orderInfo, '|', 1), '|', -1),
    SUBSTRING_INDEX(SUBSTRING_INDEX(customerInfo, '|', 1), '|', -1),
    SUBSTRING_INDEX(SUBSTRING_INDEX(orderInfo, '|', 2), '|', -1),
    SUBSTRING_INDEX(orderInfo, '|', -1)
FROM unf;

-- SİPARİŞ KALEMLERİ
INSERT INTO orderitems (order_id, product_id, quantity)
SELECT DISTINCT
    SUBSTRING_INDEX(SUBSTRING_INDEX(orderInfo, '|', 1), '|', -1),
    SUBSTRING_INDEX(SUBSTRING_INDEX(productDetails, '|', 3), '|', -1),
    1
FROM unf;

-- YORUMLAR
INSERT INTO comments (comment_id, user_id, model_id, comment_text, rating, comment_date)
SELECT DISTINCT
    SUBSTRING_INDEX(SUBSTRING_INDEX(commentInfo, '|', 1), '|', -1),
    SUBSTRING_INDEX(SUBSTRING_INDEX(customerInfo, '|', 1), '|', -1),
    SUBSTRING_INDEX(SUBSTRING_INDEX(carInfo, '|', 4), '|', -1),
    SUBSTRING_INDEX(SUBSTRING_INDEX(commentInfo, '|', 2), '|', -1),
    SUBSTRING_INDEX(SUBSTRING_INDEX(commentInfo, '|', 3), '|', -1),
    SUBSTRING_INDEX(commentInfo, '|', -1)
FROM unf;
```

## 4. A view to recreate the original dataset from our 3NF tables

```
CREATE VIEW unf_view AS
SELECT DISTINCT
    cm.model_id,
    cm.model_name,
    cm.transmission_id AS transmission,
    cm.energy_source_id AS energysource,
    cm.engine_size AS carenginesize,
    cm.horsepower AS enginepower,
    cm.body_style_id AS carbodystyle,
    cm.door_count,
    cm.weight,
    cm.max_speed,
    cm.baggage_size,
    b.brand_id AS brandid,
    b.brand_name,
    b.slogan,
    p.product_id,
    p.color,
    p.package_type AS package,
    p.price,
    p.stock,
    cu.user_id AS userid,
    cu.name,
    cu.surname,
    cu.email,
    cu.birthdate AS bday,
    ci.password AS pw,
    ci.phone,
    ci.address,
    od.order_id,
    od.order_date AS transactiondate,
    od.status_id AS status,
    oi.quantity,
    com.comment_id AS commentid,
    com.comment_text AS commentbody,
    com.rating,
    com.comment_date
FROM customers cu
INNER JOIN contactinfo ci ON ci.user_id = cu.user_id
INNER JOIN orderdetails od ON od.user_id = cu.user_id
INNER JOIN orderitems oi ON oi.order_id = od.order_id
INNER JOIN products p ON p.product_id = oi.product_id
INNER JOIN carmodels cm ON p.model_id = cm.model_id
INNER JOIN brand b ON b.brand_id = cm.brand_id
LEFT JOIN comments com ON com.user_id = cu.user_id AND com.model_id = cm.model_id;
```



The customers have provided feedback on our design, specifically asking for the addition of multi-currency price monitoring features



*Additionally, they want to ensure that the final system can store customer payment information (such as card details)*

# To do that we wrote this queries



```
ALTER TABLE price_history ADD  
currency_code VARCHAR(3);
```



```
CREATE TABLE PaymentInfo (  
paymentInfoId userId bankName  
accountNumber cardNumber  
cardHolderName expiryDate isDefault  
createdAt updatedAt FOREIGN KEY  
(userId) INDEX idx_payment_user  
(userId)
```

## OTHER TASKS GIVEN TO US

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1. List all customers who have ordered a particular product



2. Show total stock count for each model aggregated across colors and variants



3. Order a product and change the stock value



4. Place new product orders



5. Remove products from the system.