



ATILIM UNIVERSITY SCHOOL OF BUSINESS

DEPARTMENT OF ECONOMICS

ECON485

INSTRUCTOR: Bora GÜNGÖREN

VETERINARY CENTER BUSINESS ANALYSIS

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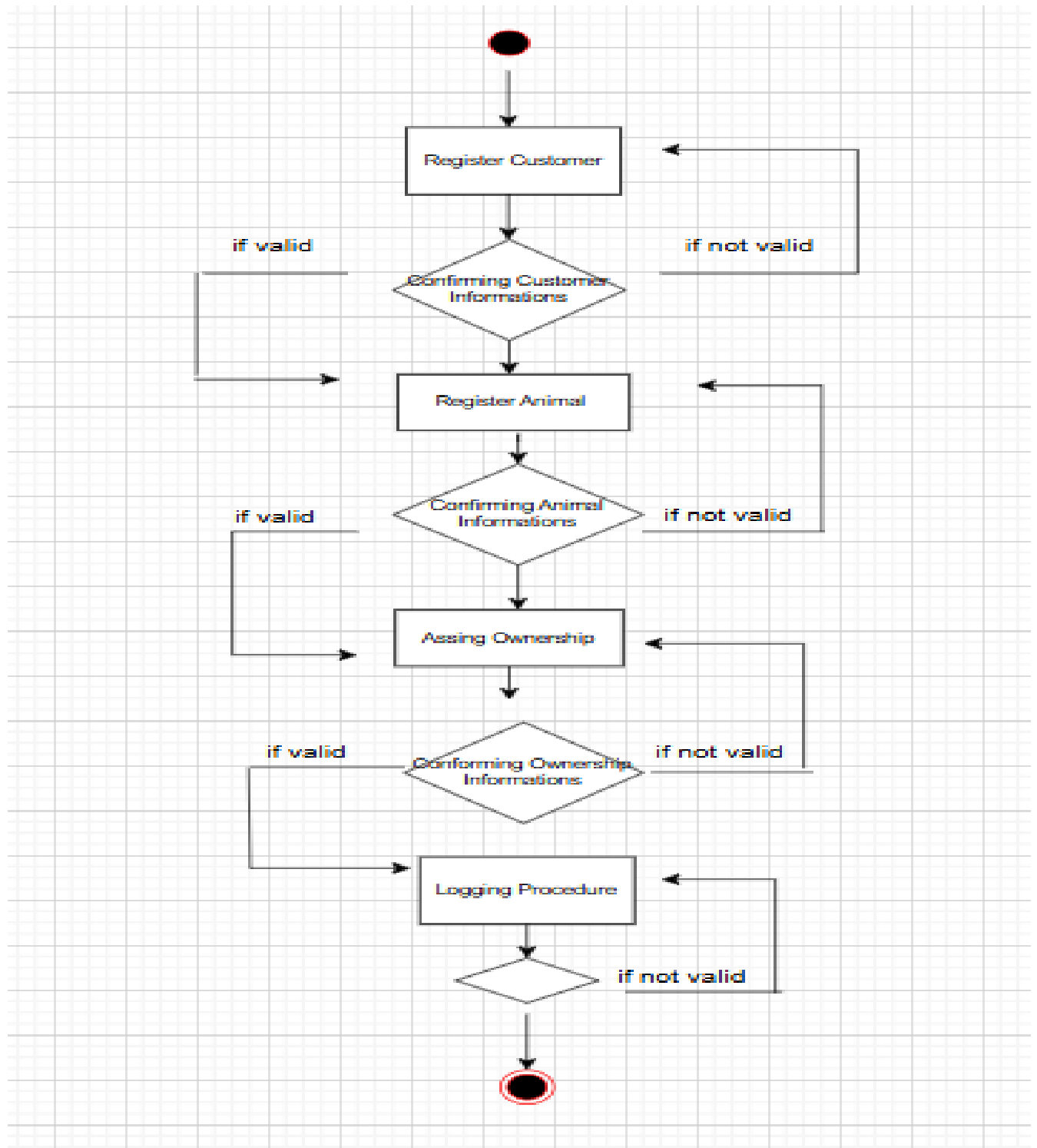
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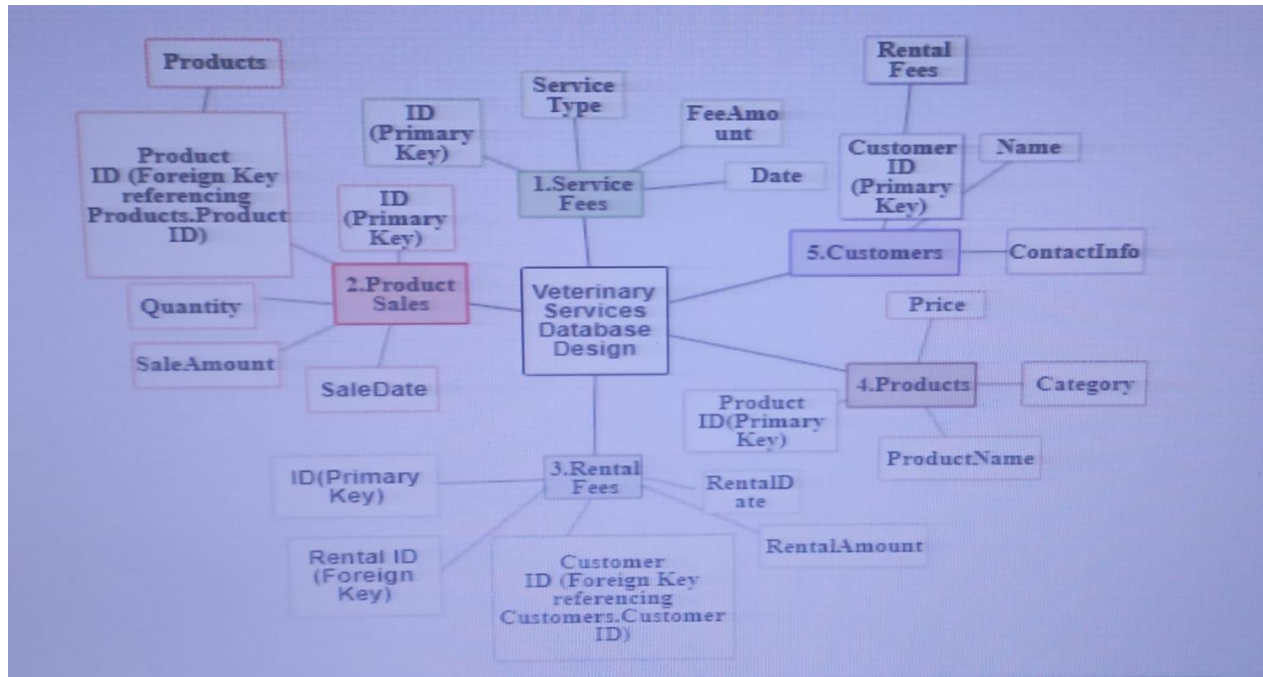
SCOPE TABLE

Contents	Scope Statement
Animal Management	In-scope
Customer Management	In-scope
Detailed customer database	Out-of-scope
Stock management	Out-of-scope
Ownership records	In-scope
Procedure/Transaction Records	In-scope

BUSINESS PROCESS FLOW



ER DIAGRAMS



NORMALIZATION

Customers				Animals					
Customer_ID	Customer Name	Telephone	Address	Pet_ID	Animal Type	Breed	Gender	Name	Birth Date
001	Pelin Işık	+90 531 585 18 48	Ankara, Türkiye	TR04877513	Cat	Tabby	Male	Çarli	31/03/2022
002	Seda Gültekin	+90 531 275 37 95	Antalya, Türkiye	TR01496698	Cat	Tabby	Female	Nohut	18/06/2022
003	Kübra Kılıç	+90 541 600 74 65	İstanbul, Türkiye	TR01583518	Dog	Husky	Female	Karamel	09/03/2002
004	Mercan Yokuş	+90 543 645 71 62	İzmir, Türkiye	TR01486365	Cat	Tortoiseshell	Male	Lotus	15/06/2020
005	Cansu Çelik	+90 505 020 92 54	Kayseri, Türkiye	TR01432974	Cat	Tabby	Male	Acun	01/08/2019

Ownerships						
Ownership_ID	Customer_ID	Pet_ID	Ownership Status	Start Date	End Date	Notes
TUR7620	001	TR04877513	Active	22/02/2023	NULL	Enrolling with the veterinarian in 2023.
TUR7934	002	TR01496698	Active	10/10/2022	NULL	Enrolling with the veterinarian and adopted from the shelter in 2022.
TUR6010	003	TR03256531	Ended	11/03/2002	29/07/2024	Dog passed away due to natural causes.
TUR 6602	004	TR01486365	Ended	09/03/2002	10/03/2002	Ownership transferred to another owner.
TUR7219	005	TR06892451	Active	20/08/2019	NULL	Adopted from the vet clinic in 2019

Ownership_ID	Customer_ID	Pet_ID	Animal Type	Procedure Type	Procedure Start Date	Procedure End Date
TUR7620	001	TR04877513	Cat	internal and external parasite vaccinations	22/02/2023	22/02/2023
TUR7934	002	TR01496698	Cat	internal and external parasite vaccinations	22/12/2022	22/12/2022
TUR6602	004	TR01486365	Cat	sterilization surgery(On the 10th day the stitches will be removed)	01/04/2023	10/04/2023
TUR7219	005	TR06892451	Cat	Checkup(complete blood count, biochemical analysis of blood, urine and feces examination, ultrasonography, X-ray, ECG.)	03/05/2023	03/05/2023

2NF TABLES

1.Customer Table

Customer_ID	Ownership_ID	Customer Name
001	TUR7620	Pelin Işık
002	TUR7934	Sedanur Gültekin
004	TUR6602	Mercan Yokuş
005	TUR7219	Cansu Çelik

Customer_ID: The unique identifying number of the customer. This column identifies the client and acts as the main key for the table.

Ownership_ID: This field specifies the relationship between the client and the pet. A specific pet may be owned by each consumer. This entry contains the ID of the customer's pet.

Customer Name: Provides the name of the customer. This column is closely related to customer information.

Database Relationship: This table contains customer information. Since every customer may own a different pet, Ownership_ID displays the relationship between the client and the pet. This table conforms with 2NF since each column is totally dependent on Customer_ID and there are no transitive relationships.

2.Pet Table

Pet_ID	Animal Type	Average Lifespan
TR04877513	Cat	15
TR01496698	Cat	15
TR01486365	Cat	15
TR06892451	Cat	15

Description:

Pet_ID: The main key in the Pet Table, this is a special identification number for every pet.

Animal Type: Denotes the kind of animal companion. All entries are now "Cat," but additional types may be added later.

Average longevity: Indicates the pet's normal longevity, which varies depending on the species (cats, for example, usually live for 15 years).

Relationship with the Database:

Pets are listed in this table, and each one is individually recognized by its Pet_ID.

Each species has its own Animal Type and Average Lifespan. The kind (currently "Cat") determines the Average Lifespan.

Since there are no transitive dependencies and every column is entirely dependent on Pet_ID, the table complies with the Second Normal Form (2NF).

3.Procedure Table

Ownership_ID	Procedure Type	Procedure Start Date	Procedure End Date
TUR7620	Vaccination	22/02/2023	22/02/2023
TUR7934	Vaccination	22/12/2022	22/12/2022
TUR6602	Surgery	01/04/2023	10/04/2023
TUR7219	Checkup	03/05/2023	03/05/2023

Ownership_ID: The identification number that identifies a pet and is used to relate the pet to specific processes.

Procedure Type: Indicates the kind of operation carried out, such as a checkup, surgery, or vaccination.

Date of process Start: The day the process starts.

Date of Procedure End: The day the procedure comes to an end.

Relationship with the Database:

Ownership_ID is used to identify the particular pet in this table, which records procedures for pets owned by clients.

Ownership_ID, which is present in both tables, connects it to the Customer Table.

Since there are no transitive dependencies and every column is entirely dependent on Ownership_ID, the table complies with the Second Normal Form (2NF).

Overall Evaluation:

Conformance to 2NF: Every table satisfies the 2NF requirements since there are no partial dependencies and every column is entirely dependent on the primary key. Additionally, transitive dependencies are removed.

Connections: The three tables are directly related to one another:

Pet Table and Customer Table: One of the customers has a pet.

Procedure Table and Pet Table: Pets are used for procedures.

Procedure Table and Customer Table: A client may have their pet undergo operations.

CREATING DATABASE ON SQL

Schema SQL ●

```
1 CREATE TABLE Customers (  
2     Customer_ID INT PRIMARY KEY,  
3     Customer_Name VARCHAR(100),  
4     Telephone VARCHAR(15),  
5     Address VARCHAR (300)  
6 ) CHARACTER SET utf8mb4 COLLATE utf8mb4_turkish_ci;  
7  
8 INSERT INTO Customers (Customer_ID, Customer_Name, Telephone, Address)  
9 VALUES  
10    ('001', 'Pelin Işık', '05315851848', 'Ankara, Türkiye'),  
11    ('002', 'Seda Gültekin', '05312753795', 'Antalya, Türkiye'),  
12    ('003', 'Kübra Kılıç', '05416007465', 'İstanbul, Türkiye'),  
13    ('004', 'Mercan Yokuş', '05436457162', 'İzmir, Türkiye'),  
14    ('005', 'Cansu Çelik', '05050209254', 'Kayseri, Türkiye');|  
15
```

```
CREATE TABLE Customers (  
  
    Customer_ID INT PRIMARY KEY,  
  
    Customer_Name VARCHAR(100),  
  
    Telephone VARCHAR(15),  
  
    Address VARCHAR (300)  
  
    ) CHARACTER SET utf8mb4 COLLATE utf8mb4_turkish_ci;
```

```
INSERT INTO Customers (Customer_ID, Customer_Name, Telephone, Address)  
VALUES  
  
    ('001', 'Pelin Işık', '05315851848', 'Ankara, Türkiye'),  
  
    ('002', 'Seda Gültekin', '05312753795', 'Antalya, Türkiye'),  
  
    ('003', 'Kübra Kılıç', '05416007465', 'İstanbul, Türkiye'),  
  
    ('004', 'Mercan Yokuş', '05436457162', 'İzmir, Türkiye'),  
  
    ('005', 'Cansu Çelik', '05050209254', 'Kayseri, Türkiye');
```

Schema SQL ●

```
1 CREATE TABLE Animals (  
2     Pet_ID VARCHAR(20) PRIMARY KEY,  
3     Animal_Type VARCHAR(20),  
4     Breed VARCHAR(50),  
5     Gender CHAR(1),  
6     Name VARCHAR(50),  
7     Birth_Date DATE  
8 ) COLLATE=utf8mb4_turkish_ci;  
9  
10 INSERT INTO Animals (Pet_ID, Animal_Type, Breed, Gender, Name, Birth_Date)  
11 VALUES  
12 ('TR04877513', 'Cat', 'Tabby', 'M', 'Çarli', '2022-03-31'),  
13 ('TR01496698', 'Cat', 'Tabby', 'F', 'Nohut', '2022-06-18'),  
14 ('TR01583518', 'Dog', 'Husky', 'F', 'Karamel', '2002-03-09'),  
15 ('TR01486365', 'Cat', 'Tortoiseshell', 'M', 'Lotus', '2020-06-15'),  
16 ('TR01432974', 'Cat', 'Tabby', 'M', 'Acun', '2019-08-01');
```

```
CREATE TABLE Animals (  
  
    Pet_ID VARCHAR(20) PRIMARY KEY,  
  
    Animal_Type VARCHAR(20),  
  
    Breed VARCHAR(50),  
  
    Gender CHAR(1),  
  
    Name VARCHAR(50),  
  
    Birth_Date DATE  
  
) COLLATE=utf8mb4_turkish_ci;
```

```
INSERT INTO Animals (Pet_ID, Animal_Type, Breed, Gender, Name, Birth_Date)  
VALUES  
  
('TR04877513', 'Cat', 'Tabby', 'M', 'Çarli', '2022-03-31'),  
  
('TR01496698', 'Cat', 'Tabby', 'F', 'Nohut', '2022-06-18'),  
  
('TR01583518', 'Dog', 'Husky', 'F', 'Karamel', '2002-03-09'),  
  
('TR01486365', 'Cat', 'Tortoiseshell', 'M', 'Lotus', '2020-06-15'),  
  
('TR01432974', 'Cat', 'Tabby', 'M', 'Acun', '2019-08-01');
```

Schema SQL ●

```
1 CREATE TABLE Ownerships (  
2     Ownership_ID VARCHAR(20) PRIMARY KEY,  
3     Customer_ID VARCHAR(20),  
4     Pet_ID VARCHAR(20),  
5     Animal_Type VARCHAR(50),  
6     Procedure_Type TEXT,  
7     Procedure_Start_Date DATE,  
8     Procedure_End_Date DATE  
9 );  
10 INSERT INTO Ownerships (Ownership_ID, Customer_ID, Pet_ID, Animal_Type, Procedure_Type,  
    Procedure_Start_Date, Procedure_End_Date)  
11 VALUES  
12 ('TUR7620', '001', 'TR04877513', 'Cat', 'internal and external parasite vaccinations', '2023-02-22',  
    '2023-02-22'),  
13 ('TUR7934', '002', 'TR01496698', 'Cat', 'internal and external parasite vaccinations', '2022-12-22',  
    '2022-12-22'),  
14 ('TUR6602', '004', 'TR01486365', 'Cat', 'sterilization surgery (On the 10th day the stitches will be  
    removed)', '2023-04-01', '2023-04-10'),  
15 ('TUR7219', '005', 'TR06892451', 'Cat', 'Checkup (complete blood count, biochemical analysis of  
    blood, urine and feces examination, ultrasonography, X-ray, ECG.)', '2023-05-03', '2023-05-03');
```

```
CREATE TABLE Ownerships (  
  
    Ownership_ID VARCHAR(20) PRIMARY KEY,  
  
    Customer_ID VARCHAR(20),  
  
    Pet_ID VARCHAR(20),  
  
    Animal_Type VARCHAR(50),  
  
    Procedure_Type TEXT,  
  
    Procedure_Start_Date DATE,  
  
    Procedure_End_Date DATE  
  
);  
  
INSERT INTO Ownerships (Ownership_ID, Customer_ID, Pet_ID, Animal_Type,  
Procedure_Type, Procedure_Start_Date, Procedure_End_Date)  
  
VALUES  
  
('TUR7620', '001', 'TR04877513', 'Cat', 'internal and external parasite  
vaccinations', '2023-02-22', '2023-02-22'),  
  
('TUR7934', '002', 'TR01496698', 'Cat', 'internal and external parasite  
vaccinations', '2022-12-22', '2022-12-22'),  
  
('TUR6602', '004', 'TR01486365', 'Cat', 'sterilization surgery (On the 10th  
day the stitches will be removed)', '2023-04-01', '2023-04-10'),
```

```
('TUR7219', '005', 'TR06892451', 'Cat', 'Checkup (complete blood count, biochemical analysis of blood, urine and feces examination, ultrasonography, X-ray, ECG.)', '2023-05-03', '2023-05-03');
```

Schema SQL ●

```
1 CREATE TABLE Procedures (  
2     Procedure_ID INT AUTO_INCREMENT PRIMARY KEY,  
3     Ownership_ID VARCHAR(20),  
4     Procedure_Type TEXT,  
5     Procedure_Start_Date DATE,  
6     Procedure_End_Date DATE,  
7     FOREIGN KEY (Ownership_ID) REFERENCES Ownerships(Ownership_ID)  
8 );  
9  
10 INSERT INTO Procedures (Ownership_ID, Procedure_Type, Procedure_Start_Date, Procedure_End_Date)  
11 VALUES  
12 ('TUR7620', 'internal and external parasite vaccinations', '2023-02-22', '2023-02-22'),  
13 ('TUR7934', 'internal and external parasite vaccinations', '2022-12-22', '2022-12-22'),  
14 ('TUR6602', 'sterilization surgery (On the 10th day the stitches will be removed)', '2023-04-01',  
15     '2023-04-10'),  
16 ('TUR7219', 'Checkup (complete blood count, biochemical analysis of blood, urine and feces  
    examination, ultrasonography, X-ray, ECG.)', '2023-05-03', '2023-05-03');
```

```
CREATE TABLE Procedures (  
  
    Procedure_ID INT AUTO_INCREMENT PRIMARY KEY,  
  
    Ownership_ID VARCHAR(20),  
  
    Procedure_Type TEXT,  
  
    Procedure_Start_Date DATE,  
  
    Procedure_End_Date DATE,  
  
    FOREIGN KEY (Ownership_ID) REFERENCES Ownerships(Ownership_ID)  
  
);
```

```
INSERT INTO Procedures (Ownership_ID, Procedure_Type, Procedure_Start_Date,  
Procedure_End_Date)  
  
VALUES  
  
('TUR7620', 'internal and external parasite vaccinations', '2023-02-22',  
'2023-02-22'),  
  
('TUR7934', 'internal and external parasite vaccinations', '2022-12-22',  
'2022-12-22'),  
  
('TUR6602', 'sterilization surgery (On the 10th day the stitches will be  
removed)', '2023-04-01', '2023-04-10'),
```

```
('TUR7219', 'Checkup (complete blood count, biochemical analysis of blood,
urine and feces examination, ultrasonography, X-ray, ECG.)', '2023-05-03',
'2023-05-03');
```

USER SCENARIO

We will register a new client and pet. In this instance, a new customer wants to register his pet at the veterinarian clinic. The database contains information about customers and animals. In the "Customers" table, the administrator enters the client's name, contact information, and address. The "Animals" table contains the pet's species, breed, gender, name, and birthdate. The "Ownerships" table now includes the customer's and the animal's ownership relationship. The "Procedures" table is updated with the action that should be performed on the pet, if required.

1. Add new consumer information:

```
INSERT INTO Customers (Customer_ID, Customer_Name, Telephone, Address)
VALUES ('004', 'Mercan Yokuş', '05436457162', 'İstanbul, Türkiye');
```

2. Add new pet information:

```
INSERT INTO Animals (Pet_ID, Animal_Type, Breed, Gender, Name, Birth_Date)
VALUES ('TR01486365', 'Cat', 'Tortoiseshell', 'M', 'Lotus', '2020-06-15');
```

3. Add new ownership record:

```
INSERT INTO Ownerships (Ownership_ID, Customer_ID, Pet_ID, Animal_Type,
Procedure_Type, Procedure_Start_Date, Procedure_End_Date)
VALUES ('TUR8347', '006', 'TR05671234', 'Dog', 'General Checkup', '2023-12-01', '2023-
12-01');
```

4. Adding a procedure record:

```
INSERT INTO Procedures (Ownership_ID, Procedure_Type, Procedure_Start_Date,
Procedure_End_Date)
VALUES ('TUR6602', 'Strilization Surgery', '2023-01-04', '2023-10-04');
```

For an existing customer, a new transaction must be added. In this case: An existing client wants to give his pet a wellness surgery. The database contains a record of this transaction. From the "Ownerships" table, the administrator confirms the pertinent client and pet data.

1. Adding new procedure information


```

INSERT INTO Procedures (Ownership_ID, Procedure_Type, Procedure_Start_Date,
Procedure_End_Date)
VALUES ('TUR6602', 'Dental Cleaning', '2023-12-15', '2023-12-15');

```

The "Procedures" table now includes the procedure type, start date, and end date. The pet should have its transaction history checked. The manager is interested in learning about the prior experiences of a pet. Using the pet's ID from the "Ownerships" table, the manager retrieves ownership data. The "Procedures" table lists the pertinent procedures based on this ownership information.

1. Query procedure history:

```

SELECT a.Name AS Pet_Name, c.Customer_Name, p.Procedure_Type,
p.Procedure_Start_Date, p.Procedure_End_Date
FROM Procedures p
JOIN Ownerships o ON p.Ownership_ID = o.Ownership_ID
JOIN Animals a ON o.Pet_ID = a.Pet_ID
JOIN Customers c ON o.Customer_ID = c.Customer_ID
WHERE a.Pet_ID = 'TR01486365';

```

Information about customers and pets needs to be updated. A pet's name was entered erroneously and needs to be changed, or a customer want to update their contact details. In the "Customers" table, the administrator modifies the client's address or phone number. The "Animals" table is updated with the pet's name or other details.

1. Update customer phone number:

```

UPDATE Customers
SET Telephone = '05439876543'
WHERE Customer_ID = '004';

```

2. Update pet's name:

```

UPDATE Animals

```

```
SET Name = 'Pamuk'  
WHERE Pet_ID = 'TR01486365';
```

It is necessary to review expired processes. The management wishes to determine which operations have gone beyond their scheduled completion dates. The administrator searches the "Procedures" table for procedures that are past their current date. The customer is advised to repeat the process if needed.

1. Querying past procedures:

```
SELECT p.Procedure_ID, c.Customer_Name, a.Name AS Pet_Name, p.Procedure_Type,  
p.Procedure_End_Date  
FROM Procedures p  
JOIN Ownerships o ON p.Ownership_ID = o.Ownership_ID  
JOIN Customers c ON o.Customer_ID = c.Customer_ID  
JOIN Animals a ON o.Pet_ID = a.Pet_ID  
WHERE p.Procedure_End_Date < CURDATE();
```