



Paw & Care

01219231 Database Systems for Software and Knowledge Engineers

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GROUP 5





Outlines

Business Domain

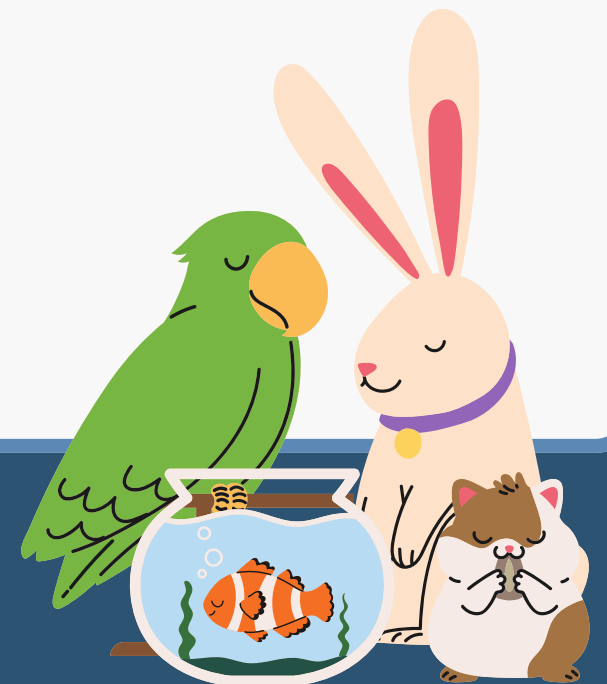
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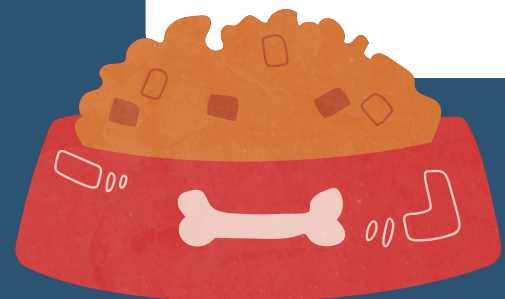


Business Domain

Veterinary hospitals are essential to the health and well-being of pets, offering a wide range of services from routine check-ups to emergency care and specialized surgeries. These facilities play a crucial role in ensuring that pets receive the necessary medical attention for both preventive care and complex medical conditions. As pet ownership continues to rise globally, veterinary hospitals are under increasing pressure to meet growing demand. This requires robust systems to manage appointments, medical records, billing, and client relations effectively.

The veterinary sector is a significant part of the larger pet care industry, which has seen rapid growth. In the U.S. alone, the pet industry is valued at over \$30 billion annually, with veterinary services representing a substantial portion of that total ([DaySmart](#)). This growth reflects the increasing value placed on pets as family members, leading to a higher demand for high-quality veterinary care.

In response to this, pet owners are increasingly seeking specialized services in areas like cardiology, dermatology, oncology, and alternative care options. There is also a rising focus on preventive care, wellness programs, and ongoing health management for pets, as owners become more invested in their pets' long-term health ([GlobalLogic](#)). The shift toward holistic and comprehensive care is driving further specialization within the industry, creating new opportunities for veterinary hospitals to expand their offerings.



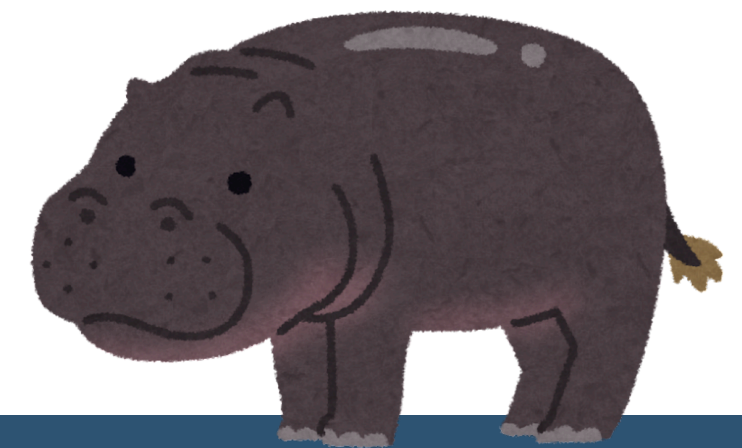
Business Domain

Paw n Care is an web application designed to manage a pet care business. It focusing on providing veterinary services and efficient clinic management. It serves as a digital solution for pet clinics to streamline operations, ensuring effective management of client relationships, medical records, and financial transactions.



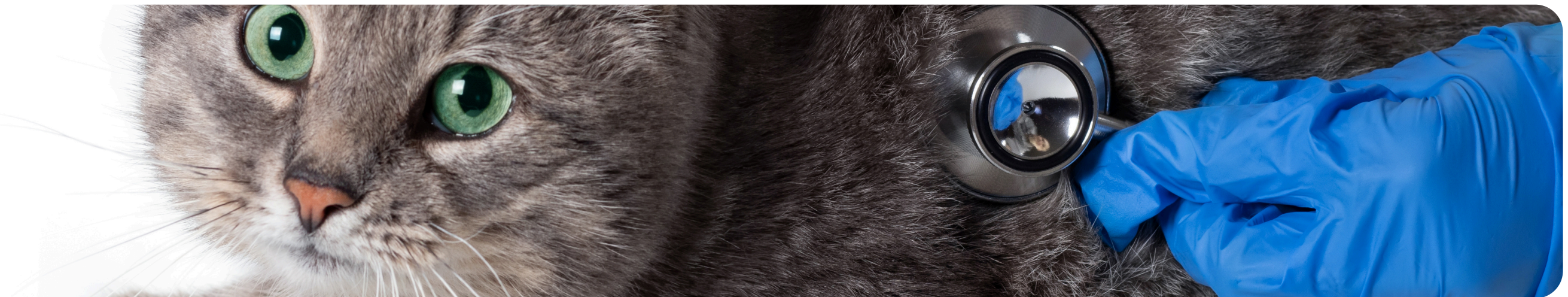
Activities/Processes

- Appointment Scheduling
 - Book appointments.
 - Track appointment details, including date, time, reason, and status (scheduled, completed, or canceled).
 - Edit or delete appointments.
- Medical Record Management
 - Create detailed medical records after consultations, including diagnoses, treatments, and prescribed medications.
 - Update ongoing treatments or medication details.
- Billing System
 - Record payments for appointments with the total amount, payment status (paid, pending, overdue), and method.
- Owner Management
 - Register new pet owners via a web form.
 - Update and manage owner details.
 - Remove inactive or duplicate owner profiles.



Activities/Processes

- Pet Management
 - Add pet information (species, breed, date of birth, gender, weight).
 - Update or edit pet details as needed (e.g., weight).
 - Delete pet records if an owner account is deactivated.
- Veterinarian Management
 - Add veterinarians' details, including specialization and license number.
 - Update contact information or credentials for veterinarians.
 - Remove records of veterinarians who leave the clinic.



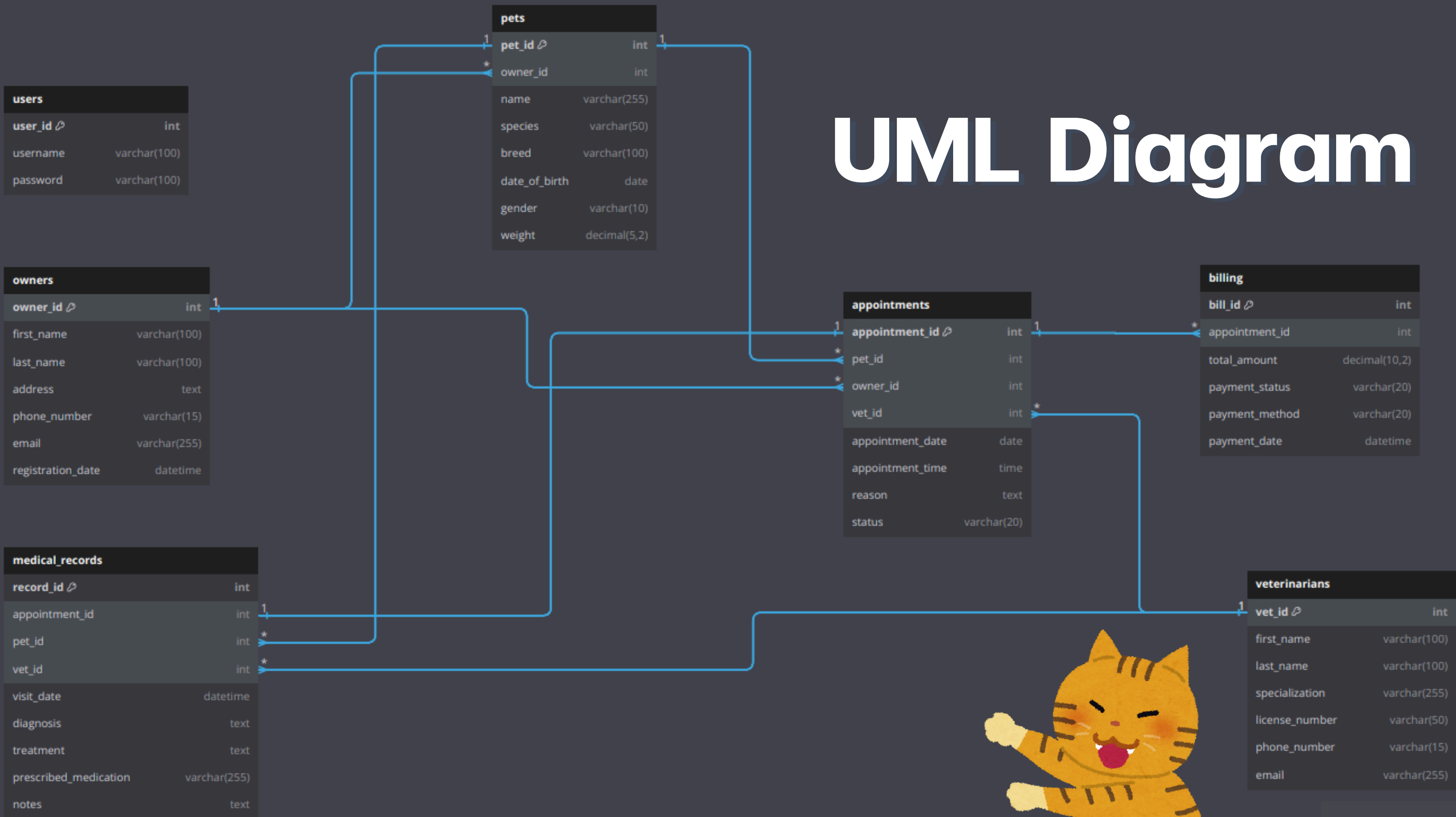
Why Do Veterinary hospitals Need Databases?

A database is crucial for managing the diverse and growing amount of data in veterinary hospitals. It helps track vital information such as pet records, medical histories, appointments, and billing. Each pet can have a unique ID that links to its medical history, ensuring veterinarians have access to accurate, up-to-date data during visits.

The database also helps streamline appointment scheduling, preventing overlaps and providing a clear overview of upcoming and past appointments. It can monitor overdue payments, manage the financial side of the practice, and ensure transparency in transactions. Moreover, with a database, records are securely stored, preventing data loss or errors, and allowing efficient retrieval for ongoing treatments or health plans.



UML Diagram



Queries

What is the average number of appointments scheduled per veterinarian per month?



```
SELECT vet, AVG(appointment_count) AS avg_appointments_per_month
FROM (
    SELECT vet, YEAR(appointment_date) AS year, MONTH(appointment_date) AS month,
    COUNT(*) AS appointment_count
    FROM appointments
    GROUP BY vet, YEAR(appointment_date), MONTH(appointment_date)
) AS subquery
GROUP BY vet;
```



Queries

What are the most common reasons for appointments for each species?

```
SELECT pets.species, appointments.reason, COUNT(*) AS reason_count
FROM appointments
JOIN pets ON appointments.pet = pets.id
GROUP BY pets.species, appointments.reason
ORDER BY reason_count DESC;
```



Queries

Which veterinarians have the highest number of completed appointments?

```
SELECT TOP 1 vet, COUNT(*) AS completed_apm
FROM appointments
WHERE status = 'completed'
GROUP BY vet
ORDER BY completed_apm DESC;
```

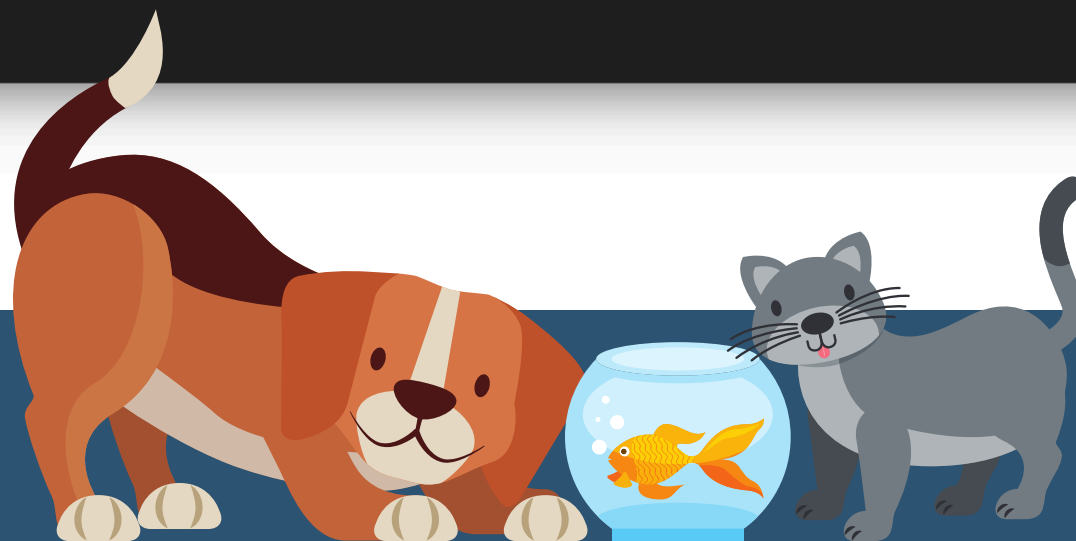


Queries

What percentage of appointments result in prescribed medications?



```
SELECT (COUNT(DISTINCT medical_records.appointment) * 100.0 / COUNT(DISTINCT
appointments.id)) AS prescribed_percentage
FROM appointments
LEFT JOIN medical_records ON appointments.id = medical_records.appointment
WHERE medical_records.prescribed_medication IS NOT NULL;
```



Queries

What is the average weight of pets by species?

```
SELECT
    pets.species,
    CAST(AVG(pets.weight) AS DECIMAL(4,2)) AS avg_weight
FROM pets
GROUP BY
    pets.species;
```



Queries

Which species of pet visits the clinic most frequently?



```
SELECT TOP 1 species, COUNT(*) AS visit_count  
FROM appointments  
JOIN pets ON appointments.id = pets.id  
GROUP BY species  
ORDER by visit_count DESC;
```



Queries

What are the top 3 diagnoses and treatments provided at the clinic?

```
WITH RankedDiagnoses AS (  
    SELECT 'Diagnosis' AS type, diagnosis AS category, COUNT(*) AS count,  
           ROW_NUMBER() OVER (ORDER BY COUNT(*) DESC) AS row_num  
    FROM medical_records  
    GROUP BY diagnosis  
)  
,  
RankedTreatments AS (  
    SELECT 'Treatment' AS type, treatment AS category, COUNT(*) AS count,  
           ROW_NUMBER() OVER (ORDER BY COUNT(*) DESC) AS row_num  
    FROM medical_records  
    GROUP BY treatment  
)  
SELECT type, category, count  
FROM RankedDiagnoses  
WHERE row_num <= 3  
UNION  
SELECT type, category, count  
FROM RankedTreatments  
WHERE row_num <= 3  
ORDER BY count DESC;
```



Queries

How many unique owners have returned for services more than once in the last six months?



```
SELECT appointments.owner, COUNT(appointments.id) AS total_appointments
FROM appointments
WHERE appointments.appointment_date >= DATEADD(MONTH, -6, GETDATE())
GROUP BY appointments.owner
HAVING COUNT(appointments.id) > 1;
```



Queries

What is the sum of billings this month?

```
SELECT SUM(total_amount) AS total_billing_this_month
FROM billings
WHERE MONTH(payment_date) = MONTH(GETDATE())
      AND YEAR(payment_date) = YEAR(GETDATE());
```



Queries

What is the average billing amount per appointment?



```
SELECT CAST(ROUND(AVG(billings.total_amount), 2) AS DECIMAL(10, 2)) AS avg_billing  
FROM billings  
JOIN appointments ON billings.appointment = appointments.id;
```



Queries

What proportion of invoices are paid on time versus pending or overdue?

```
SELECT
  CAST(SUM(CASE WHEN billings.payment_date <= appointments.appointment_date
    THEN 1 ELSE 0 END) * 100.0 / COUNT(*) AS DECIMAL(5,2)) AS
    paid_on_time_percentage,
  CAST(SUM(CASE WHEN billings.payment_date > appointments.appointment_date
    OR billings.payment_status
    IN ('Pending', 'Overdue')
    THEN 1
    ELSE 0
    END) * 100.0 / COUNT(*) AS DECIMAL(5,2)) AS pending_or_overdue_percentage
FROM billings
JOIN appointments ON billings.appointment = appointments.id;
```



Queries

Which payment methods are most commonly used and its payment status?

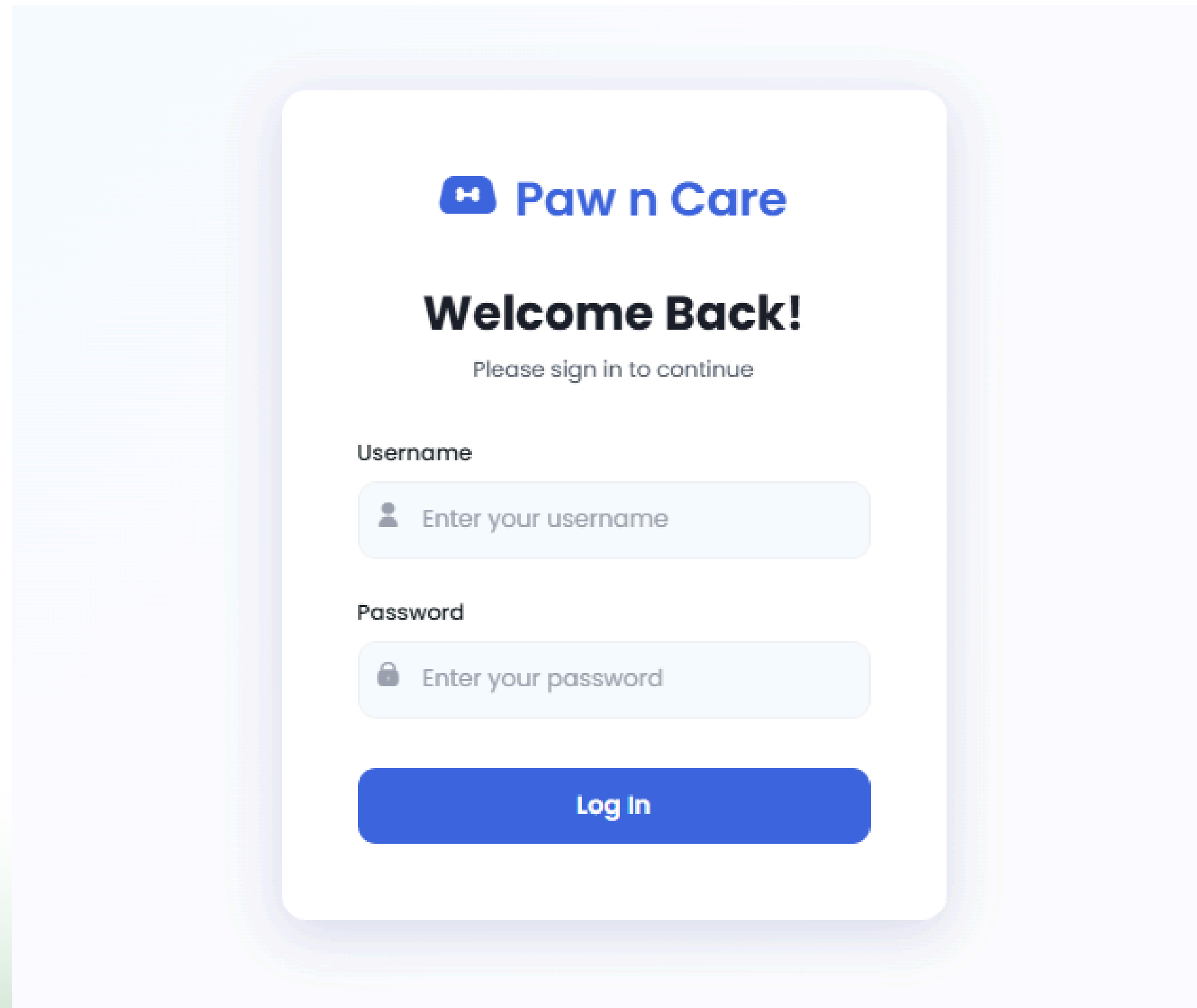



```
SELECT TOP 1 payment_method, payment_status, COUNT(*) AS method_count  
FROM billings  
GROUP BY payment_method, payment_status  
ORDER BY method_count DESC;
```



Demostration

Appendix: Application UI


The image shows a login interface for an application called "Paw n Care". The interface is centered on a light blue background. At the top, there is a blue paw print icon followed by the text "Paw n Care". Below this, the text "Welcome Back!" is displayed in a large, bold, black font. Underneath, a smaller line of text says "Please sign in to continue". The login form consists of two input fields: "Username" and "Password". Each field has a light blue border and a corresponding icon (a person for username, a padlock for password) on the left. Below the input fields is a blue "Log In" button with white text. The entire login form is enclosed in a white rounded rectangle with a subtle drop shadow.

 Paw n Care


Welcome Back!

Please sign in to continue

Username

 Enter your username

Password

 Enter your password

Log In

Appendix: Application UI

Paw n Care

Home

AppointmentsPetOwnerMedical RecordBilling

All Title

▼

Search Appointments Data

APPOINTMENT ID	VETERINARY	REASON	STATUS	APPOINTMENT DATE	APPOINTMENT TIME	PET ID	PET NAME	OWNER ID	OWNER NAME	ACTION
#1	Dr.Thorung	The pet came with hurt in its leg.	Completed	Jan. 15, 2023	10 a.m.	#1	Maximus	#1	Somchai	Edit
#2	Dr.Atikarn	The pet showed signs of skin irritation.	Completed	Jan. 22, 2023	2:30 p.m.	#2	Fluffy	#2	Sukanya	Edit
#3	Dr.Nicha	The pet came with difficulty in walking.	Completed	Feb. 6, 2023	9:45 a.m.	#3	Rex	#3	Pakorn	Edit
#4	Dr.Phumrapee	The pet experienced loss of appetite.	Canceled	Feb. 19, 2023	11:15 a.m.	#4	Whiskers	#4	Onthaya	Edit
#5	Dr.Thorung	The pet came with symptoms of fever.	Completed	Feb. 27, 2023	4 p.m.	#5	Buddy	#5	Benjamart	Edit
#6	Dr.Atikarn	The pet was sneezing frequently.	Canceled	Feb. 28, 2023	1:30 p.m.	#6	Bella	#6	Chonthicha	Edit
#7	Dr.Nicha	The pet showed unusual scratching behavior.	Completed	March 3, 2023	3:45 p.m.	#7	Luna	#7	Nitipong	Edit
#8	Dr.Phumrapee	The pet came with a wound on its paw.	Canceled	March 10, 2023	noon	#8	Charlie	#8	Manee	Edit
#9	Dr.Thorung	The pet showed signs of ear infection.	Canceled	March 16, 2023	9 a.m.	#9	Coco	#9	Prapatsorn	Edit

Appendix: Application UI

Appointments

Add appointment

Appointment

Veterinarian

Select Veterinarian

▼

Reason

Enter Reason

Status

Select status

▼

Appointment Date

mm/dd/yyyy

📅

Appointment Time

--:-- --

🕒

Pet

Add a new pet

Choose an existing pet

Pet name

Enter pet name

Weight (kg)

Enter weight

Date of birth

mm/dd/yyyy

📅

Gender

Select pet's gender

▼

Species

Select species

▼

Appendix: Application UI

Paw n Care

Medical Records

Add Medical Record

Appointment ID

Select Appointment ID

Date

dd/mm/yyyy --:--

Diagnosis

Select diagnosis

Treatment

Select treatment

Prescribed Medication

Select Medication

Notes

Enter notes

Add Record

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Appendix: Application UI

Billing

Add New Billing

Appointment ID

Select Appointment ID

Total Amount

Enter total amount

Payment Status

Select Status

Payment Method

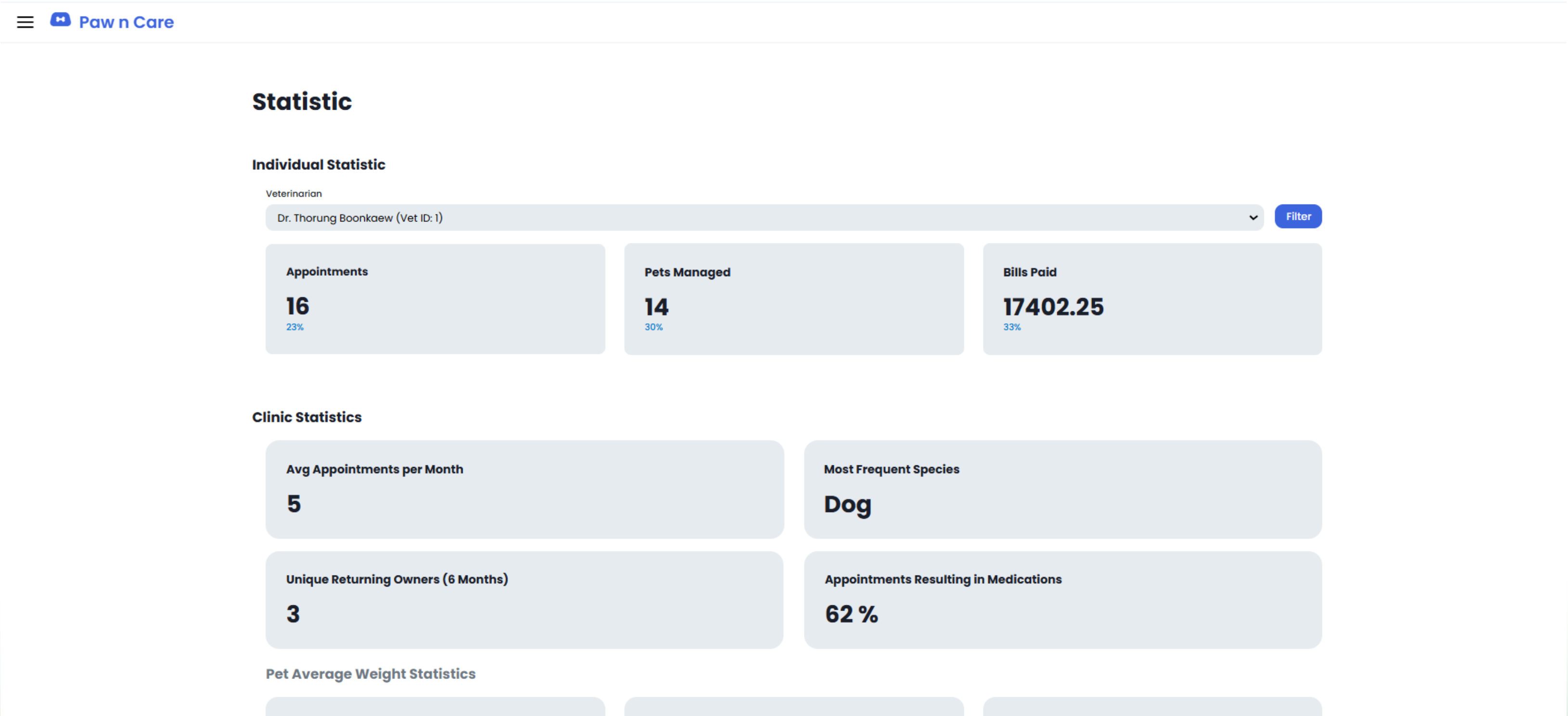
Select Payment Method

Payment Date

mm/dd/yyyy --:-- --

Add Payment

Appendix: Application UI



THANK YOU

