

Diagnoses by Gender Using CTE(Common table expressions)

Question: Count the number of diagnoses by gender using a CTE(common table expressions).

```
with GenderDiagnosis as (
    select p.gender, mr.diagnosis
    from Patients as p
    join MedicalRecords as mr on p.patient_id = mr.patient_id
)
select gender, diagnosis, count(*) as diagnosis_count
from GenderDiagnosis
group by gender, diagnosis
```

Total Diagnoses and Rank by Patient Using Window Functions

Question: List patients with the total number of diagnoses and rank them.

```
select p.patient_id, p.first_name, p.last_name,  
       count(mr.diagnosis) as total_diagnoses,  
       rank() over (order by count(mr.diagnosis) desc) as diagnosis_rank  
  from Patients as p  
join MedicalRecords as mr ON p.patient_id = mr.patient_id  
 group by p.patient_id;
```

Most Common Diagnosis by Age Group Using CTE

Question: Find the most common diagnosis for each age group using a CTE.

```
with diagnosis_age as (
    select
        case
            when extract(year from age(p.date_of_birth)) between 0 and 18 then '0-18'
            when extract(year from age(p.date_of_birth)) between 19 and 35 then '19-35'
            when extract(year from age(p.date_of_birth)) between 36 and 50 then '36-50'
            else '51+'
        end as age_group,
        mr.diagnosis,
        count(mr.diagnosis) as diagnosis_count
    from patients as p
    join medicalrecords as mr on p.patient_id = mr.patient_id
    group by age_group, mr.diagnosis
)
select age_group, diagnosis, diagnosis_count
from (
    select age_group, diagnosis, diagnosis_count,
           rank() over (partition by age_group order by diagnosis_count desc) as rank
    from diagnosis_age
) as ranked_diagnoses
where rank = 1;
```

Ranking Doctors by Patient Count Using Window Functions

Question: Rank doctors based on the number of patients they are treating.

```
select d.doctor_id, d.first_name||' '|| d.last_name as Full_name,  
       count(a.patient_id) as patient_count,  
       dense_rank() over (order by count(a.patient_id) desc) as rank  
  from Doctors as d  
left join Appointments  as a ON d.doctor_id = a.doctor_id  
 group by d.doctor_id;
```

Patients with More Than One Diagnosis

Question: Find patients who have more than one diagnosis using a subquery.

```
select
    patient_id,first_name|| ' ' ||last_name as full_name from patients
where
    patient_id in
    (select patient_id from
        medicalrecords
        group by patient_id
        having count(diagnosis)>1)
```

- Average Diagnosis by Age Group Using CTE

Question: Calculate the average number of diagnoses for each age group using a CTE.

```
with agediagnosis as(
    select case
        when extract(year from age(p.date_of_birth)) between 0 and 18 then '0-18'
        when extract(year from age(p.date_of_birth)) between 19 and 35 then '19-35'
        when extract(year from age(p.date_of_birth)) between 36 and 50 then '36-50'
        else '51+'
    end as Age_group,
    count(mr.diagnosis) as diagnosis_count
    from patients as p
    inner join medicalrecords as mr on
        p.patient_id=mr.patient_id
    group by Age_group
)
select age_group,round(avg(diagnosis_count),2) from agediagnosis
group by age_group
```

List doctors along with the number of patients they are currently treating.

```
select
    a.doctor_id,first_name||' '||last_name as full_name, count(distinct(patient_id)) as patient_count
from appointments as a
left join
doctors as d
on a.doctor_id=d.doctor_id
group by
    a.doctor_id,full_name
order by
    patient_count desc
```

Follow-up Appointment Delay

Find patients who had their follow-up appointments delayed by more than 30 days.

```
select
    p.patient_id,p.first_name,p.last_name,a1.appointment_date as initial_visit,a2.appointment_date as follow_up,
    extract(day from (a2.appointment_date-a1.appointment_date)) as delay
from
    patients as p
join
    appointments as a1 on p.patient_id=a1.patient_id
join
    Appointments as a2 on p.patient_id=a2.patient_id and a2.appointment_date>a1.appointment_date
where a1.status='initial' and a2.status ='follow-up' and
|extract(day from (a2.appointment_date-a1.appointment_date))>30;
```

Diagnosis by Age Group

Create age groups (e.g., 0-18, 19-35, 36-50, 51+) and count diagnoses in each group.

```
select case
when extract(year from age(date_of_birth)) between 0 and 18 then '0-18'
when extract(year from age(date_of_birth)) between 19 and 35 then '19-35'
when extract(year from age(date_of_birth)) between 36 and 50 then '36-50'
else '51+'
end as age_group ,mr.diagnosis,count(mr.diagnosis)as diagnosis_count
from patients as p
join MedicalRecords mr on p.patient_id=mr.patient_id
group by age_group,mr.diagnosis
```

Common Patients Across Hospitals

Find patients who have appointments at more than one hospital.

```
select |
    p.first_name,p.last_name ,count(hospital_id)
from
    patients as p left join
    appointments as a on p.patient_id=a.patient_id
    left join doctors as d
        on d.doctor_id=a.doctor_id
group by  p.first_name,p.last_name
having count(hospital_id)>1
```

Doctors by Appointment Rate

Rank doctors by the average number of appointments they have scheduled per week.

```
select
    d.doctor_id,d.first_name,d.last_name,
    count(a.appointment_id)/count(distinct DATE_TRUNC('week',a.appointment_date)) as avg_appoinntments_per_week
from
    Doctors as d
join
    Appointments as a on a.doctor_id=d. doctor_id
group by
    d.doctor_id
order by
    avg_appoinntments_per_week
```

- Comparison of Treatment Effectiveness

Analyze and compare the number of follow-up visits for patients treated with different treatments for the same condition.

```
select
    mr.diagnosis, mr.treatment, count(a.appointment_id) as follow_up_count
from
    Medicalrecords as mr
join
    Appointments as a on mr.patient_id=mr.patient_id
where
    a.status='follow-up'
group by
    mr.diagnosis, mr.treatment
```

Appointment Status Analysis

For each status (scheduled, completed, cancelled), show the percentage of total appointments.

```
select
    status, count(appointment_id) as count ,
    count(appointment_id)*100.00/(select count(*) from Appointments) as percentage
from
    appointments
group by
    status
```

Top 5 Patients by Appointment Count

Identify the top five patients with the most appointments, showing their details.

```
select
    p.patient_id, count(a.patient_id) as appointment_count, first_name, last_name, gender
from
    appointments as a
left join
    patients as p
on a.patient_id=p.patient_id
group by p.patient_id, first_name, last_name, gender
order by count(a.patient_id)
limit 5
```

Diagnosis Frequency for Each Hospital

Count the frequency of diagnoses made at each hospital and sort them by the count.

```
select
    hospital_name ,diagnosis ,count(diagnosis) from
    medicalrecords as m join doctors as d on m.doctor_id=d.doctor_id
join
    hospitals as h on h.hospital_id=d.hospital_id
group by diagnosis,hospital_name
order by count desc
```

Follow-up Appointments

Retrieve a list of patients who have a follow-up appointment scheduled after their initial visit

```
SELECT
    p.patient_id, p.first_name, p.last_name, a1.appointment_date AS initial_visit, a2.appointment_date AS follow_up
FROM
    Patients p
JOIN Appointments a1 ON p.patient_id = a1.patient_id
JOIN Appointments a2 ON p.patient_id = a2.patient_id AND a2.appointment_date > a1.appointment_date
WHERE
    a1.status = 'initial' AND a2.status = 'follow-up';
```

Doctors Treating Same Patient

List doctors who have treated the same patient, showing their names and the patient's details.

```
select distinct d1.first_name as doctor1_first_name, d1.last_name as doctor1_last_name,
           d2.first_name as doctor2_first_name, d2.last_name as doctor2_last_name,
           p.first_name as patient_first_name, p.last_name as patient_last_name
  from Doctors as d1
  join Appointments a1 on d1.doctor_id = a1.doctor_id
  join MedicalRecords mr on a1.patient_id = mr.patient_id
  join Doctors d2 on mr.doctor_id = d2.doctor_id
  join Patients p on a1.patient_id = p.patient_id
 where d1.doctor_id <> d2.doctor_id;
```

-Hospital Patient Age Distribution

For each hospital, calculate the average age of patients and display the results.

```
SELECT
    round(avg(EXTRACT(YEAR FROM AGE(CURRENT_DATE,date_of_birth))),0) as average_age ,hospital_id
From
    patients as p
inner join
    medicalrecords as m on p.patient_id=m.patient_id
inner join
    doctors as d on m.doctor_id=d.doctor_id
group by
    hospital_id
```

Doctor Performance

For each doctor, count the number of patients seen and average the number of follow-up appointments per patient.

```
select d.doctor_id, d.first_name, d.last_name, count(distinct a.patient_id) as patient_count,
       avg(follow_up_count) as avg_follow_ups
  from Doctors d
 join Appointments a on d.doctor_id = a.doctor_id
 join (
    select patient_id, count(appointment_id) as follow_up_count
      from Appointments
     where status = 'follow-up'
   group by patient_id
  ) AS f ON a.patient_id = f.patient_id
 group by d.doctor_id;
```

Appointment Trends Over Time

Generate a report showing the number of appointments scheduled per month for the past year.

```
SELECT upper(to_char(DATE_TRUNC('month', appointment_date), 'month')) AS appointment_month,  
COUNT(appointment_id) AS appointment_count  
from appointments  
where appointment_date>=current_date-interval '1 year'  
group by appointment_month  
order by appointment_month desc
```

Top Specializations

Identify which specialization has the highest number of doctors and the average number of patients each doctor sees.

```
select d.specialization, count(d.doctor_id) as doctor_count , round(avg(COALESCE(a.patient_count,0)),1) as avg_patient_count
from Doctors as d
left join ( select doctor_id, count(patient_id) as patient_count
            from Appointments
            group by doctor_id) as a
            on d.doctor_id=a.doctor_id
group by d.specialization
order by doctor_count DESC;
```

Hospitals with Highest Patient Count

List the hospitals sorted by the number of patients they have, including the count.

```
select hospital_name, count(patient_id)
from
  doctors as d
inner join
  medicalrecords as m
on d.doctor_id=m.doctor_id
inner join
  hospitals as h
on
  d.hospital_id=h.hospital_id
group by h.hospital_id
order by count(patient_id) desc
```

```
-- 4. Common Diagnoses by Gender
-- Question: Determine the most common diagnosis for male and female patients.
select p.gender,m.diagnosis,count(m.diagnosis)
from
medicalrecords as m
inner join
patients as p on
m.patient_id=p.patient_id
group by p.gender,m.diagnosis
```

```
-- . Recent Patient Visits
-- Question: Retrieve a list of patients who have had their last visit in the past 60 days along with their latest diagnosis.
select
m.patient_id,first_name|| ' ' ||last_name as fullname,diagnosis
from
medicalrecords as m
inner join
patients as p
on
m.patient_id=p.patient_id
where |
m.date_of_visit >=CURRENT_DATE-interval '60 days'
```

```
-- |. Doctors with No Appointments
-- Question: Find doctors who have not seen any patients (no appointments scheduled).

select
d.doctor_id, d.first_name, d.last_name
from
doctors as d left join appointments a
on
d.doctor_id=a.doctor_id
where
a.appointment_id is null
```

```
-- Patients with Multiple Appointments
-- Question: Identify patients who have had more than three appointments and list their details.

select
first_name|| ' '||last_name as full_name,count(a.patient_id)
from
appointments as a inner join patients as p
on
a.patient_id=p.patient_id
group by
first_name|| ' '||last_name
having
count(a.patient_id)>1
```