




1. How many records are there in each of the following tables: appointment, billing, doctor, medical_procedures, and patient?


=> Select

```
(select count(*) from appointment) as appointment_count,  
(select count(*) from billing) as billing_count,  
(select count(*) from doctor) as doctor_count,  
(select count(*) from medical_procedures) as medical_procedures_count,  
(select count(*) from patient) as patient_count;
```

Result Grid

  Filter Rows:

Export: 

Wrap Cell Content: 

	appointment_count	billing_count	doctor_count	medical_procedures_count	patient_count
1	1000	1000	1000	1000	1000

2. How many distinct doctors exist, along with what are their names?

=> select count(distinct doctorname) as count_doctor from doctor;
select distinct doctorname from doctor;

Result Grid	
	count_doctor
	548

Result Grid		Filter Rows:	Export:	Wrap Cell Content:
	doctorname			
	Shell			
	Regina			
	Sissy			
	Celestyna			
	Thalia			
	Brynnna			
	Maye			
	Concettina			
	Minda			
	Charissa			
	Lanae			
	Ida			

3. What are the appointment details (including patient names) organized by appointment ID?

=> select a.appointmentid, p.firstname, p.lastname, a.date, a.time
from patient p
join appointment a on p.patientid = a.patientid
order by a.appointmentid;

Result Grid	Filter Rows:	Export:	Wrap Cell Content:	Fetch rows:
appointmentid	firstname	lastname	date	time
103	Blake	Beldas	2020-01-17	2023-12-23T14:33:46.415Z
103	Christy	O'Carroll	2020-01-17	2023-12-23T14:33:46.415Z
103	Valli	Blisse	2020-01-17	2023-12-23T14:33:46.415Z
103	Shauna	Ioab	2020-01-17	2023-12-23T14:33:46.415Z
103	Sissy	Bari	2020-01-17	2023-12-23T14:33:46.415Z
104	Coral	Armanda	2021-12-29	2023-12-23T14:33:46.410Z
104	Chloris	Ferrell	2021-12-29	2023-12-23T14:33:46.410Z
104	Grier	Ummersen	2021-12-29	2023-12-23T14:33:46.410Z
110	Elka	Orpah	2023-07-19	2023-12-23T14:33:46.412Z
110	Kelly	Celestine	2023-07-19	2023-12-23T14:33:46.412Z
114	Janey	Bearnard	2023-10-08	2023-12-23T14:33:46.412Z
114	Demetris	Ade	2022-07-27	2023-12-23T14:33:46.414Z

4. What are the procedure details, including patient names?

```
=> select p.firstname, p.lastname, mpr.procedurename
from patient p
join appointment a on p.patientid = a.patientid
join medical_procedures mpr on a.appointmentid = mpr.appointmentid;
```

Result Grid

Filter Rows:

Export:

Wrap Cell Content:

Fetch rows:

firstname	lastname	procedurename
Shel	Dearborn	Hormone replacement therapy
Shel	Dearborn	General health check-ups
Shel	Dearborn	Dermatologic surgery
Mara	Shuler	Cochlear implant surgery
Sharlene	Luhe	Dialysis
Sharlene	Luhe	X-rays, CT scans, MRI scans
Sharlene	Luhe	Orthopedic surgery
Sharlene	Luhe	Endoscopy
Sharlene	Luhe	Trauma resuscitation
Sharlene	Luhe	Sedation for minor procedures
Sharlene	Luhe	MRI for brain imaging
Merry	Henebry	Epidural analgesia during labor

5. What are the doctor's details and appointment information?

```
=> select d.doctorname, d.specialization, a.patientid, a.appointmentid, a.date, a.time
from doctor d
join appointment a on d.doctorid = a.doctorid;
```

Result Grid

Filter Rows:

Export:

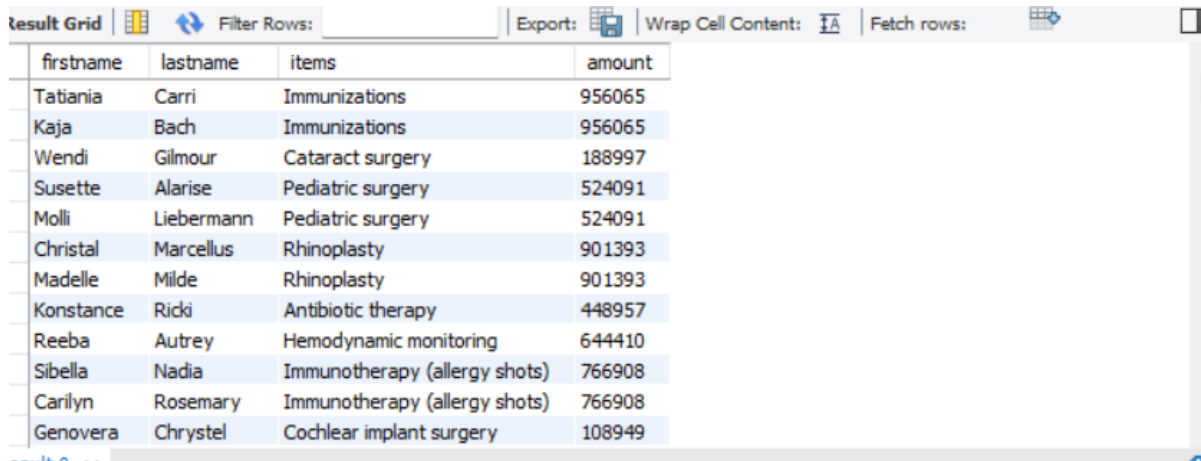
Wrap Cell Content:

Fetch rows:

doctorname	specialization	patientid	appointmentid	date	time
Cyndie	Cardiology	465	281	2022-12-09	2023-12-23T14:33:46.407Z
Minda	Obstetric Anesthesiologists	465	281	2022-12-09	2023-12-23T14:33:46.407Z
Leontine	Radiology	443	628	2020-01-08	2023-12-23T14:33:46.407Z
Merrie	Ophthalmology	443	628	2020-01-08	2023-12-23T14:33:46.407Z
Adele	Cardiology	852	889	2023-08-30	2023-12-23T14:33:46.407Z
Lanna	Radiology	852	889	2023-08-30	2023-12-23T14:33:46.407Z
Maye	Pulmonologists	852	889	2023-08-30	2023-12-23T14:33:46.407Z
Tomasina	Surgery	160	551	2022-07-04	2023-12-23T14:33:46.407Z
Nanete	Oncologist	160	551	2022-07-04	2023-12-23T14:33:46.407Z
Lynnea	Internists	886	769	2020-11-24	2023-12-23T14:33:46.407Z
Iseabal	Gastroenterology	480	385	2022-02-26	2023-12-23T14:33:46.407Z
Nadine	Pediatrics	634	813	2021-01-24	2023-12-23T14:33:46.407Z

6. What are the billing data for each patient?

```
=> select p.firstname, p.lastname, b.items, b.amount  
from patient p  
join billing b on p.patientid = b.patientid;
```

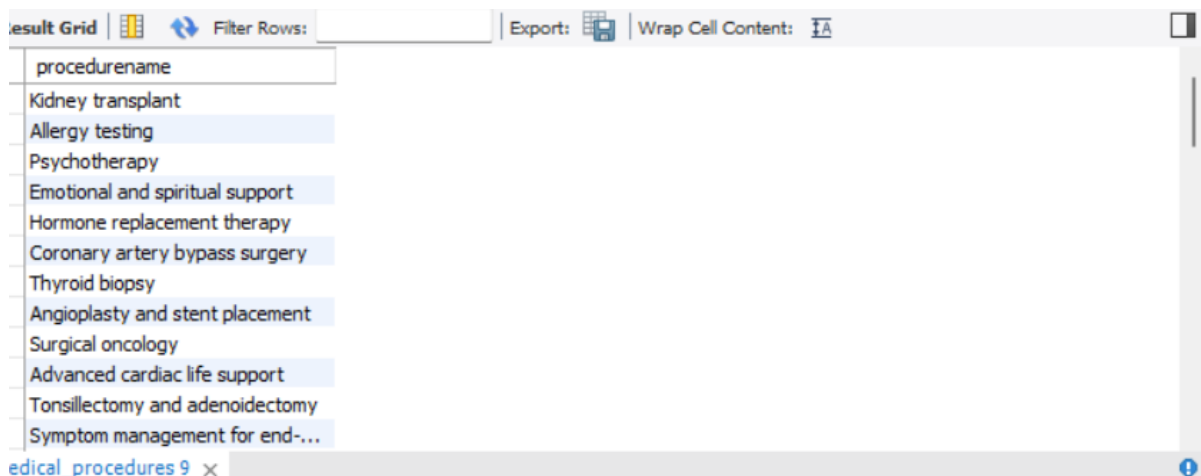


The screenshot shows a database result grid with columns: firstname, lastname, items, and amount. It contains 14 rows of data representing different patients and their billing items.

firstname	lastname	items	amount
Tatiana	Carri	Immunizations	956065
Kaja	Bach	Immunizations	956065
Wendi	Gilmour	Cataract surgery	188997
Susette	Alarise	Pediatric surgery	524091
Molli	Liebermann	Pediatric surgery	524091
Christal	Marcellus	Rhinoplasty	901393
Madelle	Milde	Rhinoplasty	901393
Konstance	Ricki	Antibiotic therapy	448957
Reeba	Autrey	Hemodynamic monitoring	644410
Sibella	Nadia	Immunotherapy (allergy shots)	766908
Carilyn	Rosemary	Immunotherapy (allergy shots)	766908
Genovera	Chrystel	Cochlear implant surgery	108949

-- 7. What are the distinctive procedure names?

```
=> select distinct procedurename from medical_procedures;
```

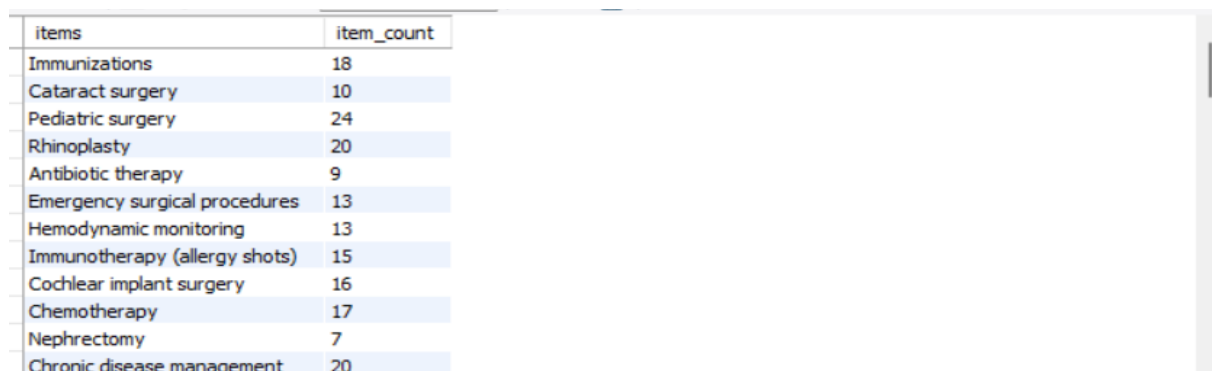


The screenshot shows a database result grid with a single column: procedurename. It lists 14 distinct medical procedures.

procedurename
Kidney transplant
Allergy testing
Psychotherapy
Emotional and spiritual support
Hormone replacement therapy
Coronary artery bypass surgery
Thyroid biopsy
Angioplasty and stent placement
Surgical oncology
Advanced cardiac life support
Tonsillectomy and adenoidectomy
Symptom management for end-...

-- 8. What are the unique things in the billing records, and how frequently does each appear?

```
=> select distinct items, count(items) as item_count  
from billing  
group by items;
```



The screenshot shows a database result grid with columns: items and item_count. It lists 13 unique items and their respective counts from the billing records.

items	item_count
Immunizations	18
Cataract surgery	10
Pediatric surgery	24
Rhinoplasty	20
Antibiotic therapy	9
Emergency surgical procedures	13
Hemodynamic monitoring	13
Immunotherapy (allergy shots)	15
Cochlear implant surgery	16
Chemotherapy	17
Nephrectomy	7
Chronic disease management	20

9. How many doctors are there for each specialization?

```
=> select d.specialization, count(d.doctorid) as doctor_count
      from doctor d
      group by d.specialization
      order by doctor_count desc;
```

specialization	doctor_count
Oncologist	54
Otolaryngologists	52
Ophthalmology	51
Internists	50
Infectious disease	48
Allergists	48
Emergency Medicine	46
Surgery	46
Pediatrics	46
Neurology	45
Anesthesiology	44
Endocrinologist	44

10. What are the appointment trends over time (monthly)?

```
=> select extract(month from date) as month, count(appointmentid) as total_appointments
      from appointment
      group by month
      order by month;
```

month	total_appointments
1	97
2	78
3	77
4	96
5	77
6	87
7	80
8	80
9	81
10	78
11	82
12	87

11. Which patients have multiple appointments (patient retention)?

```
=> select p.patientid, p.firstname, p.lastname, count(a.appointmentid) as total_appointments
      from patient p
      join appointment a on p.patientid = a.patientid
      group by p.patientid, p.firstname, p.lastname
      having count(a.appointmentid) > 1;
```

patientid	firstname	lastname	total_appointments
465	Bettine	Huggins	3
465	Mathilda	Torray	3
443	Trixi	Carmena	4
160	Leia	Diann	2
886	Lindie	Daniele	3
886	Bill	Mich	3
480	Sharlene	Kiersten	2
212	Bibby	Tannie	2
212	Annice	Gino	2
380	Blinni	Zamora	2
948	Jere	Sabella	2
104	Chere	Maisey	2

-- 12. What are the most frequent medical procedures?

```
=> select mpr.procedurename, count(mpr.procedureid) as procedure_count
from medical_procedures mpr
group by mpr.procedurename
order by procedure_count desc ;
```

procedurename	procedure_count
X-rays, CT scans, MRI scans	26
Coronary artery bypass surgery	25
Comprehensive geriatric assessment	24
Interventional radiology procedures	23
Dermatologic surgery	22
Sedation for minor procedures	22
Laser therapy for skin conditions	22
General surgery	22
Allergy testing	21
Advanced cardiac life support	21
Cataract surgery	21
Endoscopy	21

13. What is the total revenue made by doctors, grouped by specialization?

```
=> select d.specialization, sum(b.amount) as total_revenue
from doctor d
join appointment a on d.doctorid = a.doctorid
join billing b on a.patientid = b.patientid
group by d.specialization;
```

specialization	total_revenue
Pediatrics	25867715
Radiology	35156337
Ophthalmology	35841684
Oncologist	25235497
Cardiology	18067128
Neurology	21799995
Pulmonologists	26753803
Allergists	41867095
Endocrinologist	28045530
Family Medicine	23818076
Obstetric Anes...	23671970
Anesthesiology	30638467

14. What is the current total of billing amounts per patient?

```
=> select b.patientid, p.firstname, p.lastname, b.items, b.amount,
       sum(b.amount) over (partition by b.patientid order by b.invoiceid) as runningtotal
   from billing b
  join patient p on b.patientid = p.patientid;
```

patientid	firstname	lastname	items	amount	runningtotal
103	Lusa	Alisia	General anesthesia for surgeries	941657	1883314
103	Jennica	Ashely	General anesthesia for surgeries	941657	1883314
103	Jennica	Ashely	Nephrectomy	203301	2289916
103	Lusa	Alisia	Nephrectomy	203301	2289916
104	Chere	Maisey	Hemodynamic monitoring	676780	1353560
104	Joane	Yam	Hemodynamic monitoring	676780	1353560
104	Joane	Yam	Symptom management for end-of-life care	891700	3136960
104	Chere	Maisey	Symptom management for end-of-life care	891700	3136960
106	Kara-Lynn	Shanley	Electroconvulsive therapy (ECT)	319541	639082
106	Petronia	Tamsky	Electroconvulsive therapy (ECT)	319541	639082
108	Antonietta	Claudine	General surgery	943604	943604
111	Leontine	Zachary	Emergency surgical procedures	431618	431618

15. How are doctors ranked according to the quantity of procedures they perform?

```
=> select d.doctorname, count(mpr.procedureid) as procedurecount,
       rank() over (order by count(mpr.procedureid) desc) as doctorrank
   from doctor d
  join appointment a on d.doctorid = a.doctorid
  join medical_procedures mpr on a.appointmentid = mpr.appointmentid
 group by d.doctorname;
```

doctorname	procedurecount	doctorrank
Cyndie	13	1
Moyna	13	1
Lolita	13	1
Tera	12	4
Jinny	11	5
Lorenza	11	5
Karena	10	7
Lanna	10	7
Jeanna	9	9
Orelia	9	9
Quintina	9	9
Flory	8	12

16. Which patients have paid more than the average amount for billing?

```
=> a. Calculate the average billing amount
with average_spending as (
  select avg(total_amount) as avg_spent
  from (
    select sum(amount) as total_amount
    from billing
    group by patientid
  ) as temp
)
```

b. Find patients who paid more than the average

```
select p.patientid, p.firstname, p.lastname, sum(b.amount) as total_spent
   from patient p
  join billing b on p.patientid = b.patientid;
```

```

join billing b on p.patientid = b.patientid
group by p.patientid, p.firstname, p.lastname
having sum(b.amount) > (select avg_spent from average_spending);

```

patientid	firstname	lastname	total_spent
894	Tatiana	Carri	1718550
894	Kaja	Bach	1718550
448	Wendi	Gilmour	2020587
618	Susette	Alarise	1639964
618	Molli	Liebermann	1639964
117	Christal	Marcellus	1764184
117	Madelle	Milde	1764184
261	Genovera	Chrystel	1819533
261	Annecorinne	Papageno	1819533
384	Ninnetta	Old	1258590
619	Kristina	Ackerley	1341880
141	Marinna	Bartlett	1294043

17. Which procedures have a total billed cost that exceeds the average?

=> a. Calculate the average billed amount per procedure

with avg_billed as (

```
select avg(sum_amount) as avg_billed
```

```
from (
```

```
select sum(b.amount) as sum_amount
```

```
from billing b
```

```
join appointment a on b.patientid = a.patientid
```

```
group by a.appointmentid
```

```
) as temp
```

```
)
```

b. Find procedures that exceed the average billing

```
select mpr.procedurename
```

```
from medical_procedures mpr
```

```
join appointment a on mpr.appointmentid = a.appointmentid
```

```
join billing b on a.patientid = b.patientid
```

```
group by mpr.procedurename
```

```
having sum(b.amount) > (select avg_billed from avg_billed);
```

procedurename
Well-child check-ups
Plastic surgery
Hemodynamic monitoring
Dementia care
X-rays, CT scans, MRI scans
Advanced cardiac life support
Anesthetic care during childbirth
Thyroid biopsy
Polypharmacy management
Laser therapy for skin conditions
Surgical oncology
General surgery

18. How are patients ranked according to their spending?

=> a. Calculate total spending per patient

```
with patient_spending as (  
  select p.patientid, p.firstname, p.lastname, sum(b.amount) as total_spent  
  from patient p  
  join billing b on p.patientid = b.patientid  
  group by p.patientid, p.firstname, p.lastname  
)
```

b. Calculate average spending of all patients

```
select ps.patientid, ps.firstname, ps.lastname, ps.total_spent,  
  case when ps.total_spent > (select avg(total_spent) from patient_spending)  
    then 'Above Average'  
    else 'Below Average'  
  end as spending_category  
from patient_spending ps;
```

patientid	firstname	lastname	total_spent	spending_category
894	Tatiana	Carri	1718550	Above Average
894	Kaja	Bach	1718550	Above Average
448	Wendi	Gilmour	2020587	Above Average
618	Susette	Alarise	1639964	Above Average
618	Molli	Liebermann	1639964	Above Average
117	Christal	Marcellus	1764184	Above Average
117	Madelle	Milde	1764184	Above Average
374	Konstance	Ricki	448957	Below Average
140	Reeba	Autrey	754555	Below Average
734	Sibella	Nadia	766908	Below Average
734	Carilyn	Rosemary	766908	Below Average
261	Genovera	Chrystel	1819533	Above Average

19. What is the most common procedure performed by doctors?

=> a. Count how many times each procedure was done by doctors

```
with procedure_frequency as (  
  select d.doctorname, mpr.procedurename, count(*) as procedure_count  
  from doctor d  
  join appointment a on d.doctorid = a.doctorid  
  join medical_procedures mpr on a.appointmentid = mpr.appointmentid  
  group by d.doctorname, mpr.procedurename  
)
```

b. Show the most common procedures done by doctors

```
select doctorname, procedurename, procedure_count  
from procedure_frequency  
order by procedure_count desc;
```


doctorname	procedurename	procedure_count
Jinny	Surgical oncology	3
Hallie	Comprehensive geriatric assessment	3
Flory	Hormone replacement therapy	2
Valli	Surgical oncology	2
Constance	Surgical oncology	2
Orsola	Surgical oncology	2
Nita	Psychotherapy	2
Fredericka	Allergy testing	2
Eolanda	General surgery	2
Charmaine	Intensive care management	2
Lorenza	Interventional radiology procedures	2
Hyacinthe	General health check-ups	2

20. How many procedures were completed, and what was the average billing amount each procedure?

```
=> select mpr.procedurename, count(mpr.procedureid) as total_procedures, avg(b.amount) as avg_billing
from medical_procedures mpr
join appointment a on mpr.appointmentid = a.appointmentid
join billing b on a.patientid = b.patientid
group by mpr.procedurename;
```

procedurename	total_procedures	avg_billing
Well-child check-ups	23	481732.1304
Plastic surgery	26	567732.6923
Hemodynamic monitoring	31	546470.0968
Dementia care	24	574473.1250
X-rays, CT scans, MRI scans	22	389102.1818
Advanced cardiac life support	34	578097.9118
Anesthetic care during childbirth	12	573214.0833
Thyroid biopsy	18	335273.6667
Polypharmacy management	19	529978.2105
Laser therapy for skin conditions	20	594529.5500
Surgical oncology	28	487538.1786
General surgery	39	596673.4359

21. What is the maximum, minimum, and average amount billed per item?

```
=> select items, max(amount) as max_amount, min(amount) as min_amount, avg(amount) as avg_amount
from billing
group by items;
```

items	max_amount	min_amount	avg_amount
Immunizations	967709	45782	478724.8333
Cataract surgery	923796	39971	375959.8000
Pediatric surgery	996843	68135	546824.3333
Rhinoplasty	954389	52625	446479.3000
Antibiotic therapy	977957	144746	455308.4444
Emergency surgical procedures	985052	134921	630763.0769
Hemodynamic monitoring	955371	46028	487250.7692
Immunotherapy (allergy shots)	848216	16790	426554.1333
Cochlear implant surgery	904874	108949	498465.6875
Chemotherapy	989313	16567	498760.0588
Nephrectomy	943641	38172	616646.2857
Chronic disease management	990073	145410	610135.7500