

# GROUP-16

1. Retrieve the medical details of the patient having the healthcard\_id=1.

## Relational Algebra

$\Pi^*(\sigma_{\text{healthcard\_id}=1}(\text{private\_hospital\_cases}))$

## SQL QUERY

```
SELECT * FROM lab5.private_hospital_cases WHERE healthcard_id=1;
```

The screenshot shows the pgAdmin 4 interface. The Query Editor displays the SQL query: `SELECT * FROM lab5.private_hospital_cases WHERE healthcard_id=1;`. The Data Output tab shows the results of the query, which is a single row of data from the `private_hospital_cases` table.

case_id	case_report	medical_prescription	date	year	hospital_id	doctor_id	disease_id	healthcard_id	insurance_policy_id
1	501 abc.pdf	paracetamol 2 times in the day	2014-08...	2014	101	101	1001	1	201

## 2. Retrieve the names of the patients and the diseases that patient has suffered.

### Relational Algebra

$\Pi_{\text{fname, disease\_name}} (\Join (\pi_{\text{pd, personal\_details}} \bowtie_{\text{pd.healthcard\_id=hc.healthcard\_id}} \pi_{\text{hc, personal\_hospital\_cases}}) \bowtie_{\text{hc.disease\_id=d.disease\_id}} \pi_{\text{d, disease}}))$

### SQL QUERY

```
SELECT fname, disease_name FROM lab5.personal_detail AS pd JOIN
lab5.private_hospital_cases AS hc ON (pd.healthcard_id=hc.healthcard_id) JOIN lab5.disease AS d
ON (hc.disease_id=d.disease_id);
```

The screenshot shows the pgAdmin 4 web interface. On the left, the 'Browser' pane displays a tree view of the database schema, with 'Tables (12)' expanded and 'disease' selected. The 'Query Editor' pane on the right contains the following SQL query:

```
1 SELECT fname , disease_name FROM lab5.personal_detail AS pd JOIN lab5.private_hospital_cases AS hc
2 ON (pd.healthcard_id=hc.healthcard_id) JOIN lab5.disease AS d ON (hc.disease_id=d.disease_id);
```

Below the query editor, the 'Data Output' tab is active, displaying the results of the query in a table with two columns: 'fname' and 'disease\_name'. The results are as follows:

fname	disease_name
1 Rahul	asthma
2 Samar	asthma
3 Sneha	blood cancer
4 Vancy	tuberculosis
5 Hrithik	blood cancer

### 3. Count the number of people suffering from a particular disease.

#### Relational Algebra

$\pi_{\text{disease\_name}}(\sigma_{\text{COUNT}(\text{disease\_name})}(\rho_{\text{hc, personal\_hospital\_cases}} \bowtie \langle \text{hc.disease\_id} = \text{d.disease\_id} \rangle (\rho_{\text{d, disease}})))$

#### SQL Query

```
SELECT disease_name, COUNT (disease_name) FROM lab5.private_hospital_cases AS hc JOIN lab5.disease AS d ON (hc.disease_id=d.disease_id) GROUP BY disease_name;
```

The screenshot shows the pgAdmin 4 interface. On the left, the 'Tables (12)' folder is expanded, showing the 'disease' table. The 'Query Editor' window displays the following SQL query:

```
1 SELECT disease_name, COUNT(disease_name) FROM lab5.private_hospital_cases AS hc JOIN lab5.disease AS d ON (hc.disease_id=d.disease_id) GROUP BY disease_name;
```

Below the query editor, the 'Data Output' tab shows the results of the query:

disease_name	count
blood cancer	2
tuberculosis	1
asthma	2

#### 4. Retrieve the names of the patients and the year when they have suffered from the disease 'asthma'.

### Relational Algebra

$\Pi_{\text{fname\_name, disease\_name, year}} (\rho_{\text{pd, personal\_details}} \bowtie_{\text{pd.healthcard\_id=hc.healthcard\_id}} \rho_{\text{hc, private\_hospital\_cases}} \bowtie_{\text{hc.disease\_id=d.disease\_id}} \rho_{\text{d, disease\_name='asthma'}} (\text{disease}))$

### SQL QUERY

```
SELECT fname, disease_name, year FROM lab5.personal_detail AS pd JOIN
lab5.private_hospital_cases AS hc ON (pd.healthcard_id=hc.healthcard_id) JOIN lab5.disease AS d
ON (hc.disease_id=d.disease_id) WHERE disease_name='asthma';
```

The screenshot shows the pgAdmin 4 web interface. On the left, the 'Browser' pane displays the database structure, including 'personal\_detail', 'private\_hospital\_cases', and 'disease'. The 'Query Editor' pane on the right contains the following SQL query:

```
1 SELECT fname, disease_name, year FROM lab5.personal_detail AS pd JOIN lab5.private_hospital_cases AS hc
2 ON (pd.healthcard_id=hc.healthcard_id) JOIN lab5.disease AS d ON (hc.disease_id=d.disease_id) WHERE disease_name='asthma';
```

Below the query editor, the 'Data Output' tab shows the results of the query in a table format:

fname	disease_name	year
1 Rahul	asthma	2014
2 Samar	asthma	2015

5. Retrieve the names of the insurance companies and the policies provided by them.

## Relational Algebra

$\Pi_{\text{company\_name}, \text{policy\_name}} (\Join (\pi_{\text{ip}, \text{insurance\_policy}}) \bowtie_{\text{ip.insurance\_company\_id} = \text{ic.insurance\_company\_id}} \pi_{\text{ic}, \text{insurance\_company}})$

## SQL QUERY

```
SELECT company_name, policy_name FROM lab5.insurance_policy AS ip JOIN
lab5.insurance_company AS ic ON (ip.insurance_company_id=ic.insurance_company_id);
```

The screenshot shows the pgAdmin 4 interface. The left sidebar displays the database structure, with the 'insurance\_policy' table selected under the 'insurance\_company' schema. The main window shows the 'Query Editor' with the following SQL query:

```
1
2
3 SELECT company_name, policy_name FROM lab5.insurance_policy AS ip JOIN lab5.insurance_company AS ic
4 ON (ip.insurance_company_id=ic.insurance_company_id);
```

Below the query editor, the 'Data Output' tab is active, displaying the results of the query in a table format:

company_name	policy_name
LIC Life Insurance Company	Jeevan Anand
Aegon Life Insurance Comp...	Aegon Health Premier
LIC Life Insurance Company	Jeevan Nidhi
Max Life Insurance Company	Corona Kavach
HDFC Life Insurance Compa...	Health Suraksha Policy
SBI Life Insurance Company	Corona Rakshak
Aviva Life Insurance Company	Smart Super Health Plan
SBI Life Insurance Company	Health Guard
HDFC Life Insurance Compa...	MediCare Plan

## 6. Count the number of patients who have taken a particular Insurance Policy.

### Relational Algebra

disease\_name F count (fname) (P (pd, personal\_detail) ⋈<pd.healthcard\_id=hc.healthcard\_id> P (hc, personal\_hospital\_cases) ⋈<hc.disease\_id=d.disease\_id> P (d, disease)))

### SQL QUERY

```
SELECT policy_name, COUNT (fname) FROM lab5.personal_detail AS pd JOIN
lab5.private_hospital_cases AS hc ON (pd.healthcard_id=hc.healthcard_id) JOIN
lab5.insurance_policy AS ip ON (hc.insurance_policy_id=ip.insurance_policy_id) GROUP BY
policy_name;
```

The screenshot shows the pgAdmin 4 web interface. On the left, the 'Browser' pane displays the database structure, with 'insurance\_policy' selected under 'Columns (4)'. The 'Query Editor' pane shows the following SQL query:

```
3
4
5
6
7 SELECT policy_name,COUNT(fname) FROM lab5.personal_detail AS pd JOIN lab5.private_hospital_cases AS hc
8 ON (pd.healthcard_id=hc.healthcard_id) JOIN lab5.insurance_policy AS ip
9 ON (hc.insurance_policy_id=ip.insurance_policy_id) GROUP BY policy_name;
10
11
```

The 'Data Output' pane displays the results of the query in a table:

policy_name	count
Corona Kavach	1
Aegon Health Premier	1
Jeevan Nidhi	1
Jeevan Anand	2

A green status bar at the bottom indicates: 'Successfully run. Total query runtime: 59 msec. 4 rows affected.'

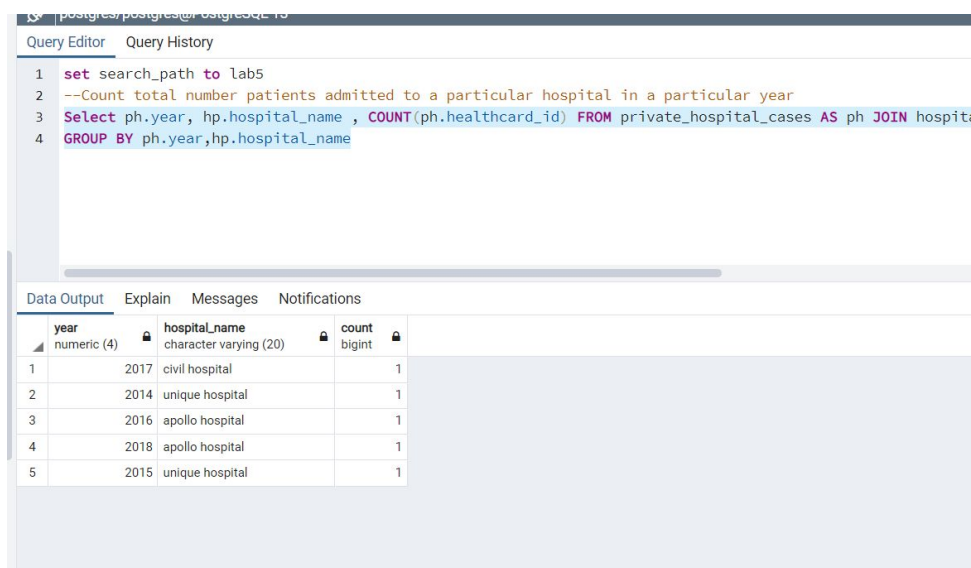
## 7. Count total number patients admitted to a particular hospital in a particular year

### Relational Algebra

$\pi_{ph.year, hp.hospital\_name} \sigma_{COUNT(ph.healthcard\_id) \leq 1} (\rho(ph, private\_hospital\_cases) \bowtie \rho_{<ph.hospital\_id=hp.hospital\_id>} \rho(hp, hospital))$

### SQL

Select ph.year, hp.hospital\_name , COUNT(ph.healthcard\_id) FROM private\_hospital\_cases AS ph JOIN hospital AS hp on (ph.hospital\_id=hp.hospital\_id) GROUP BY ph.year, hp.hospital\_name



The screenshot shows a PostgreSQL query editor with a query that counts patients by year and hospital. The query is as follows:

```
1 set search_path to lab5
2 --Count total number patients admitted to a particular hospital in a particular year
3 Select ph.year, hp.hospital_name , COUNT(ph.healthcard_id) FROM private_hospital_cases AS ph JOIN hospital AS hp on (ph.hospital_id=hp.hospital_id) GROUP BY ph.year, hp.hospital_name
```

The results are displayed in a table with the following columns: year, hospital\_name, and count. The results are as follows:

year	hospital_name	count
2017	civil hospital	1
2014	unique hospital	1
2016	apollo hospital	1
2018	apollo hospital	1
2015	unique hospital	1

## 8. Count total number of patients in all hospitals

### Relational Algebra

$\pi_{hp.hospital\_name} \sigma_{COUNT(*) \leq 1} (\rho(p, private\_hospital\_cases) \bowtie \rho_{<p.hospital\_id=hp.hospital\_id>} \rho(hp, hospital))$

### SQL

Select COUNT (\*), h.hospital\_name from lab5.private\_hospital\_cases AS p JOIN lab5.hospital AS h ON (p.hospital\_id=h.hospital\_id) Group BY h.hospital\_name

postgres/postgres@PostgreSQL 13	
Query Editor	Query History
<pre> 1  -- Count total number of patients in all hospitals 2  select COUNT(*), h.hospital_name from lab5.private_hospital_cases AS p JOIN lab5.hospital AS h ON (p.hosp </pre>	
Data Output	Explain Messages Notifications
count bigint	hospital_name character varying (20)
1	2 apollo hospital
2	1 civil hospital
3	2 unique hospital

## 9. Retrieve the contact number of the hospital located in MP.

### Relational Algebra

$\Pi_{\text{hospital\_name}, \text{contact}} (\sigma_{\text{hospital\_address.state}='mp'} (\text{hospital} \bowtie_{\text{hospital.hospital\_id}=\text{hospital\_address.hospital\_id}} \text{hospital\_address}))$

### SQL

```

SELECT hospital_name, contact FROM lab5.hospital
JOIN lab5.hospital_address ON lab5.hospital.hospital_id = lab5.hospital_address.hospital_id
WHERE lab5.hospital_address.state = mp;

```

Data Output	Explain	Messages	Notifications
	hospital_name character varying (20)	contact numeric (10)	
1	aims hospital	7890839209	
2	aims hospital	6737767373	



## 10. Retrieve the contact number of the doctor who treated in the private hospital Unique Hospital.

### Relational Algebra

```
r1<-Πhospital_id (σhospital_name='unique hospital' (lab5.hospital))
Result<-Πdoctor_name,contact(ρ(dd,lab5.doctor_detail)
⋈<dd.doctor_id=lab5.private_hospital_cases.doctor_id>(σlab5.private_hospital_cases.hospital_id=r
1))
```

### SQL

```
SELECT doctor_name,contact FROM lab5.doctor_detail as dd
JOIN lab5.private_hospital_cases ON dd.doctor_id = lab5.private_hospital_cases.doctor_id
WHERE lab5.private_hospital_cases.hospital_id = (SELECT hospital_id FROM lab5.hospital
WHERE hospital_name='unique hospital') ;
```

	Data Output	Explain	Messages	Notifications
	doctor_name character varying (20)		contact numeric (10)	
1	rahul sharma		7689958765	
2	umang patel		7835393434	

## 11. Find the name of the hospitals who have their centers in navrangpura.

### Relational Algebra

```
Πh.hospital_name,ha.address_line1,ha.address_line2,ha.area(ρ(h,lab5.hospital)⋈<h.hospital_id=ha.
hospital_id>( ρ(ha,σarea='Navrangpura' lab5.hospital_address)))
```

### SQL

```
SELECT h.hospital_name,ha. address_line1, ha.address_line2,ha.area FROM lab5.hospital as h
JOIN lab5.hospital_address AS ha ON (h.hospital_id=ha.hospital_id) where area='Navrangpura';
```

	Data Output	Explain	Messages	Notifications
	hospital_name character varying (20)	address_line1 character varying (100)	address_line2 character varying (100)	area character varying (20)
1	aims hospital	Arya complex	Opp doctor house	Navrangpura
2	medilink hospital	Rohini Complex	Opp Sankalp	Navrangpura

**12. Find the name of the hospital in which the patient having the healthcard ID as 1 got treatment in the year 2014.**

## Relational Algebra

$\Pi_{fname, lname, hospital\_name, year}(\rho(pd, lab5.personal\_detail)$   
 $\bowtie_{<pd.healthcard\_id=hc.healthcard\_id>} \rho(hc, lab5.private\_hospital\_cases)$   
 $\bowtie_{<hc.hospital\_id=h.hospital\_id>} \rho(h, \sigma(year=2014 \wedge hc.healthcard\_id=1)(lab5.hospital)))$

## SQL

SELECT fname, lname, hospital\_name, year FROM lab5.personal\_detail pd  
 JOIN lab5.private\_hospital\_cases AS hc ON(pd.healthcard\_id=hc.healthcard\_id)  
 JOIN lab5.hospital AS h ON(hc.hospital\_id=h.hospital\_id)  
 Where year=2014 AND hc.healthcard\_id=1;

	Data Output	Explain	Messages	Notifications
	fname character varying (20)	lname character varying (20)	hospital_name character varying (20)	year numeric (4)
1	Rahul	Shah	unique hospital	2014

## 13. Retrieve names of patients who are suffering from more than one diseases

### Relational Algebra

$R1 = \pi_{ph.healthcard\_id, pd.fname, pd.lname} (\sigma_{ph.healthcard\_id = pd.healthcard\_id} (P(ph, private\_hospital\_cases)))$

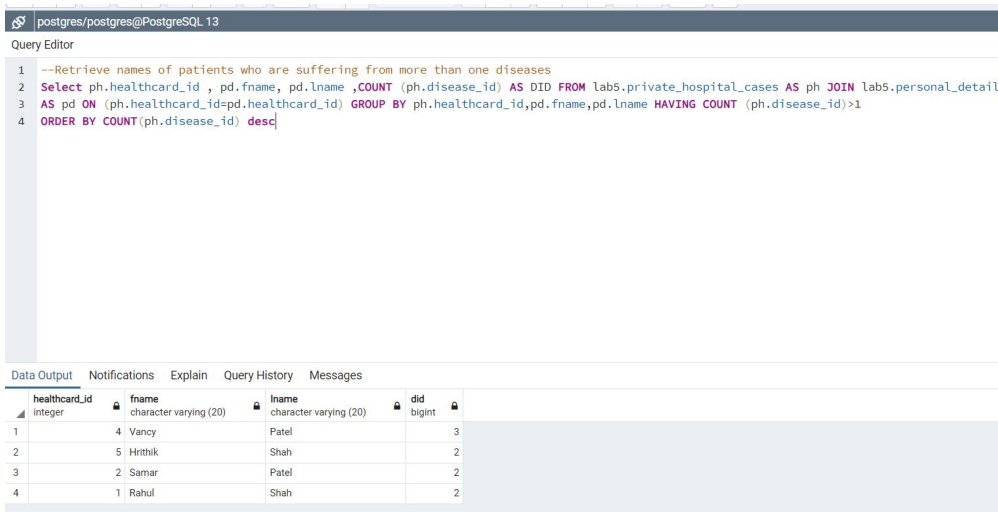
$R2 = \sigma_{count(ph.disease\_id) > 1}(R1)$

$R3 = \pi_{pd.fname, pd.lname} (\sigma_{pd.healthcard\_id = ph.healthcard\_id} (P(pd, personal\_detail)))$

$Result = \pi_{count(ph.disease\_id)}(R2 \bowtie R3)$

### SQL

```
Select ph.healthcard_id , pd.fname, pd.lname ,COUNT (ph.disease_id) AS DID FROM
lab5.private_hospital_cases AS ph JOIN lab5.personal_detail AS pd ON
(ph.healthcard_id=pd.healthcard_id) GROUP BY ph.healthcard_id,pd.fname,pd.lname HAVING
COUNT (ph.disease_id)>1 ORDER BY COUNT(ph.disease_id) desc
```



The screenshot shows a PostgreSQL 13 Query Editor window. The query is as follows:

```
1 --Retrieve names of patients who are suffering from more than one diseases
2 Select ph.healthcard_id , pd.fname, pd.lname ,COUNT (ph.disease_id) AS DID FROM lab5.private_hospital_cases AS ph JOIN lab5.personal_detail
3 AS pd ON (ph.healthcard_id=pd.healthcard_id) GROUP BY ph.healthcard_id,pd.fname,pd.lname HAVING COUNT (ph.disease_id)>1
4 ORDER BY COUNT(ph.disease_id) desc
```

The results are displayed in a table with the following columns: healthcard\_id, fname, lname, and did. The data is as follows:

healthcard_id	fname	lname	did
4	Vancy	Patel	3
5	Hrithik	Shah	2
2	Sammar	Patel	2
1	Rahul	Shah	2

## 14. Retrieve the data of patient of Asthma disease

### Relational Algebra

```
r1 ← ⋈disease_id (σdisease_name='asthma'(lab5.disease))
Result ← ⋈healthcard_id (r1 ⋈disease_id (σdisease_name='asthma'(lab5.disease)))
```

### SQL

```
SELECT * FROM lab5.personal_detail
JOIN lab5.private_hospital_cases ON lab5.personal_detail.healthcard_id =
lab5.private_hospital_cases.healthcard_id
WHERE lab5.private_hospital_cases.disease_id = (
SELECT disease_id FROM lab5.disease WHERE disease_name='asthma');
```

Data Output Explain Messages Notifications

	healthcard_id integer	birth_certificate_id integer	fname character	lname character	father_name character vary	mother_name character varyi	gender charac	dob date	address_line1 character varying (100)	address_line2 character varyi	state charac	city character var	pincode numeric (6)	case_id integer
1	1	5001	Rahul	Shah	Rohil	Rama	Male	1999-09-27	C-5,Anand Flats	Paldi	Guja...	Ahmedabad	380007	501
2	2	5002	Samar	Patel	Ronak	Pooja	Male	1997-10-20	C-10,Divya Flats	Vastrapur	Guja...	Ahmedabad	380052	502

Data Output Explain Messages Notifications

	case_report character varying (20)	medical_prescription character varying (100)	date date	year numeric (4)	hospital_id integer	doctor_id integer	disease_id integer	healthcard_id integer	insurance_policy_id integer
501	abc.pdf	paracetamol 2 times in the day	2014-08...	2014	101	101	1001	1	201
502	abc.pdf	paracetamol 2 times in the day	2015-09...	2015	101	103	1001	2	204

## 15. Display all addresses of all registered hospitals

### Relational Algebra

```
⋈hospital_name (h.hospital_name, ha.address_line1, ha.address_line2, ha.state, ha.city, ha.pincode) ⋈hospital_id (h.hospital_id, ha.address_line1, ha.address_line2, ha.state, ha.city, ha.pincode)
```

### SQL

```
Select h.hospital_name, ha.address_line1, ha.address_line2, ha.state, ha.city, ha.pincode from
hospital_address AS ha JOIN hospital AS h ON (ha.hospital_id=h.hospital_id
```

Dependencies   Dependents   lab5.personal\_d...   lab5.insurance\_...   lab5.laboratory...   postgres/postgres@PostgreSQL 13 \*   lab5.doctor\_det...   lab5.private\_h

postgres/postgres@PostgreSQL 13

Query Editor   Query History   Scratch Pad

```

1 set search_path to lab5
2 --Display all addresses of all registered hospitals
3 select h.hospital_name, ha.address_line1, ha.address_line2, ha.state, ha.city, ha.pincodes from hospital_a

```

Data Output   Explain   Messages   Notifications

	hospital_name character varying (20)	address_line1 character varying (100)	address_line2 character varying (100)	state character varying (20)	city character varying (20)	pincodes numeric (6)
1	unique hospital	add1	add2	gujarat	surat	347584
2	apollo hospital	add1	add2	maharashtra	pune	578493
3	civil hospital	add1	add2	gujarat	jamnagar	788493
4	medilink hospital	add1	add2	west bengal	kolkata	254366
5	life care hospital	add1	add2	maharashtra	nasik	567483
6	apollo hospital	add1	add2	gujarat	ahmedabad	473822
7	aims hospital	add1	add2	mp	gwalior	493483
8	aims hospital	add1	add2	mp	gwalior	493483

## 16. Display details of patients who have consulted Dr. Umang Patel or Dr. Vijay Kumar

### Relational Algebra

$$\pi_{pd.birth\_certificate\_id, pd.fname, pd.lname, pd.gender, pd.dob, dd.doctor\_name} (\sigma_{pd.healthcard\_id=ph.healthcard\_id} (\rho_{(pd, personal\_detail)})) \bowtie \sigma_{ph.doctor\_id=dd.doctor\_id} (\sigma_{dd.doctor\_name='vijay\ kumar'} (\rho_{(dd, doctor\_detail)}))$$

U


$$\pi_{pd.birth\_certificate\_id, pd.fname, pd.lname, pd.gender, pd.dob, dd.doctor\_name} (\sigma_{pd.healthcard\_id=ph.healthcard\_id} (\rho_{(pd, personal\_detail)})) \bowtie \sigma_{ph.doctor\_id=dd.doctor\_id} (\sigma_{dd.doctor\_name='umang\ patel'} (\rho_{(dd, doctor\_detail)}))$$

### SQL

Select pd.birth\_certificate\_id, pd.fname, pd.lname, pd.gender, pd.dob, dd.doctor\_name from personal\_detail AS pd JOIN private\_hospital\_cases AS ph ON (pd.healthcard\_id=ph.healthcard\_id) JOIN doctor\_detail AS dd ON (ph.doctor\_id=dd.doctor\_id) AND dd.doctor\_name='vijay kumar'

UNION

Select pd.birth\_certificate\_id, pd.fname, pd.lname, pd.gender, pd.dob, dd.doctor\_name from personal\_detail AS pd JOIN private\_hospital\_cases AS ph ON (pd.healthcard\_id=ph.healthcard\_id) JOIN doctor\_detail AS dd ON (ph.doctor\_id=dd.doctor\_id) AND dd.doctor\_name='umang patel'

 postgres/postgres@PostgreSQL 13

Query Editor

Query History

```
1 set search_path to lab5
2 Select pd.birth_certificate_id, pd.fname, pd.lname, pd.gender, pd.dob, dd.doctor_name from personal_detail
3
4 UNION
5
6 Select pd.birth_certificate_id, pd.fname, pd.lname, pd.gender, pd.dob, dd.doctor_name from personal_detail
7
```

Data Output

Explain

Messages

Notifications

	<div>birth_certificate_id</div> <div>integer</div>	<div>fname</div> <div>character varying (20)</div>	<div>lname</div> <div>character varying (20)</div>	<div>gender</div> <div>character varying (10)</div>	<div>dob</div> <div>date</div>	<div>doctor_name</div> <div>character varying (100)</div>
1	5005	Hrithik	Shah	Male	1995-03...	vijay kumar
2	5003	Sneha	Asrani	Female	1996-11...	umang patel
3	5002	Samar	Patel	Male	1997-10...	umang patel
4	5004	Vancy	Patel	Female	1998-12...	vijay kumar

## 17. Display the number of patients who have visited particular laboratories on a particular date

### Relational Algebra

$\pi_{\text{plab.pdate, lab.lab\_name}} \left( \sigma_{\text{COUNT(hc.healthcard\_id)}} \left( \rho_{\text{(hc, health\_card)}} \bowtie_{\text{<hc.lab\_id=lab.lab\_id>}} \rho_{\text{(lab, laboratory\_detail)}} \right) \bowtie_{\text{<lab.lab\_id=plab.lab\_id>}} \rho_{\text{(plab, private\_laboratory)}} \right)$

### SQL

Select plab.pdate, COUNT (hc.healthcard\_id), lab.lab\_name from health\_card AS hc JOIN laboratory\_detail AS lab ON (hc.lab\_id=lab.lab\_id) JOIN private\_laboratory AS plab ON (lab.lab\_id=plab.lab\_id) GROUP BY plab.pdate, lab.lab\_name order by plab.pdate

## 18. Count the number of particular diseases in a particular year.

### Relational Algebra

$\pi_{ph.year, d.disease\_name} \left( \sigma_{COUNT(ph.disease\_id)} \left( \rho_{(ph, private\_hospital\_cases)} \bowtie_{<ph.disease\_id=d.disease\_id>} \rho_{(d, disease)} \right) \right)$

### SQL

```
select ph.year,d.disease_name ,count(ph.disease_id)from private_hospital_cases as ph JOIN
disease as d ON (ph.disease_id=d.disease_id) group by ph.year,d.disease_name;
```

	year numeric (4)	disease_name character varying (20)	count bigint
1	2014	asthma	1
2	2014	blood cancer	2
3	2014	tuberculosis	1
4	2015	asthma	1

## 19. Medical history of a particular patient

### Relational Algebra

$\pi_{phc.case\_id, phc.case\_report, phc.medical\_prescription, phc.date, phc.year, h.hospital\_name, dd.doctor\_name, d.disease\_name} \left( \sigma_{phc.healthcard\_id=3} \left( \left( \rho_{(phc, private\_hospital\_cases)} \right) \bowtie_{<phc.hospital\_id=h.hospital\_id>} \left( \rho_{(h, hospital)} \right) \right) \bowtie_{<phc.doctor\_id=dd.doctor\_id>} \left( \left( \rho_{(dd, doctor\_detail)} \right) \bowtie_{<phc.disease\_id=d.disease\_id>} \left( \rho_{(d, disease)} \right) \right) \right)$

### SQL

```
select phc.case_id, phc.case_report, phc.medical_prescription, phc.date, phc.year,
h.hospital_name, dd.doctor_name, d.disease_name from private_hospital_cases phc join hospital
as h on (h.hospital_id=phc.hospital_id) join doctor_detail as dd on(dd.doctor_id=phc.doctor_id) join
disease as d on(d.disease_id=phc.disease_id) where phc.healthcard_id=3
```



case_id integer	case_report character varying (20)	medical_prescription character varying (30)	date date	year numeric (4)	hospital_name character varying (20)	doctor_name character varying (20)	disease_name character varying (20)
503	abc.pdf	paracetamol 2 times in the d...	2016-10...	2014	apollo hospital	umang patel	blood cancer
504	abc.pdf	paracetamol 2 times in the d...	2017-06...	2014	civil hospital	vijay kumar	tuberculosis

## 20. List number of cases of a particular hospital.

### Relational Algebra






$\Pi_{h.hospital\_name, phc.case\_id, phc.case\_report, phc.medical\_prescription, phc.date, phc.year, dd.doctor\_name, d.disease\_name, pd.healthcard\_id, pd.fname, pd.lname} (\sigma_{phc.hospital\_id=101} ((P(phc, private\_hospital\_cases)) \bowtie_{<phc.hospital\_id=h.hospital\_id>} (P(h, hospital)) \bowtie_{<phc.doctor\_id=dd.doctor\_id>} ((P(dd, doctor\_detail)) \bowtie_{<phc.disease\_id=d.disease\_id>} ((P(d, disease)) \bowtie_{<phc.healthcard\_id=pd.healthcard\_id>} ((P(pd, personal\_detail)))))$

### SQL

```

select h.hospital_name, phc.case_id, phc.case_report, phc.medical_prescription, phc.date,
phc.year, dd.doctor_name, d.disease_name, pd.healthcard_id, pd.fname, pd.lname from
private_hospital_cases phc join hospital as h on (h.hospital_id=phc.hospital_id) join doctor_detail as
dd on (dd.doctor_id=phc.doctor_id) join disease as d on (d.disease_id=phc.disease_id) join
personal_deatil as pd on (pd.healthcard_id=phc.healthcard_id) where phc.hospital_id=101

```

Data Output		Explain	Messages	Notifications										
	hospital_name character varying (20)		case_id integer		case_report character varying (20)		medical_prescription character varying (100)		date date		year numeric (4)		doctor_name character varying (20)	
1	unique hospital		501		abc.pdf		paracetamol 2 times in the day		2014-08...		2014		rahul sharma	
2	unique hospital		502		abc.pdf		paracetamol 2 times in the day		2015-09...		2015		umang patel	

Data Output	Explain	Messages	Notifications
<div><div>date</div><div>date</div></div>	<div><div>year</div><div>numeric (4)</div></div>	<div><div>doctor_name</div><div>character varying (20)</div></div>	<div><div>disease_name</div><div>character varying (20)</div></div> <div><div>healthcard_id</div><div>integer</div></div> <div><div>fname</div><div>character varying (20)</div></div> <div><div>lname</div><div>character varying (20)</div></div>
2014-08-20	2014	rahul sharma	asthma
2015-09-04	2015	umang patel	asthma



**21. Retrieve only those case id(s) which used insurance policy -Jivan Anand[201].**

### Relational Algebra

$\Pi_{\text{case\_id}} (\sigma_{\text{insurance\_policy\_id}=201}(\text{lab5.private\_hospital\_cases}))$

### SQL

SELECT case\_id FROM lab5.private\_hospital\_cases WHERE insurance\_policy\_id = 201 ;

Data Output		Explai
	case_id [PK] integer	
1	501	
2	505	

**22. Retrive the data of patients having disease id as 1001.**

### Relational Algebra

$\sigma_{(*)}(\text{lab5.personal\_detail}$

$\bowtie_{\text{lab5.personal\_detail.healthcard\_id} = \text{lab5.private\_hospital\_cases.healthcard\_id}} (\sigma_{\text{lab5.private\_hospital\_cases.disease\_id} = 1001}(\text{lab5.private\_hospital\_cases}))$

### SQL

```
SELECT * FROM lab5.personal_detail JOIN lab5.private_hospital_cases ON
lab5.personal_detail.healthcard_id = lab5.private_hospital_cases.healthcard_id WHERE
lab5.private_hospital_cases.disease_id = 1001;
```

Data Output		Explain	Messages	Notifications								
	healthcard_id integer	birth_certificate_id integer	fname character	lname character	father_name character varying	mother_name character varying	gender character	dob date	address_line1 character varying (100)	address_line2 character varying	state character	city character varying
1	1	5001	Rahul	Shah	Rohil	Rama	Male	1999-09-27	C-5,Anand Flats	Paldi	Gujarat	Ahmedabad
2	2	5002	Samar	Patel	Ronak	Pooja	Male	1997-10-20	C-10,Divya Flats	Vastrapur	Gujarat	Ahmedabad

Data Output		Explain	Messages	Notifications				
case_id	case_report	medical_prescription	date	year	hospital_id	doctor_id	disease_id	healthcard_id
integer	character varying (20)	character varying (100)	date	numeric (4)	integer	integer	integer	integer
501	abc.pdf	paracetamol 2 times in the day	2014-08-20	2014	101	101	1001	1
502	abc.pdf	paracetamol 2 times in the day	2015-09-04	2015	101	103	1001	2

**23. Find the names of the laboratories who have their centers in 'Paldi'.**

## Relational Algebra

$$\Pi_{\text{lab\_name}}(\text{laboratory\_address} \bowtie_{\text{laboratory\_address.lab\_id=laboratory\_detail.lab\_id}} (\sigma_{\text{area}='Paldi'}(\text{laboratory\_detail})))$$

## SQL

```
SELECT lab_name FROM laboratory_address JOIN laboratory_detail
ON(laboratory_address.lab_id=laboratory_detail.lab_id) WHERE area='Paldi';
```

	lab_name character varying (50)
1	The Med`s Inn
2	Golwilkar Metropolis

**24. Find the first name and last name of the person who has no medical history.**

### Relational Algebra

$\Pi_{\text{fname}, \text{lname}}(\rho(\text{pd}, \text{personal\_detail}) \bowtie_{\text{pd.healthcard\_id}=\text{hc.healthcard\_id}} (\sigma_{\text{hc.healthcard\_id IS NULL}} \rho(\text{hc}, \text{private\_hospital\_cases})))$

### SQL

SELECT fname, lname FROM personal\_detail AS pd LEFT OUTER JOIN private\_hospital\_cases AS hc ON (pd.healthcard\_id=hc.healthcard\_id) WHERE hc.healthcard\_id IS NULL;

	fname character varying (20)	lname character varying (20)
1	Govind	Somani

**25. Find the names of the hospitals and the number of their centers in ahmedabad.**

### Relational Algebra

$r1 \leftarrow \Pi_{\text{h.hospital\_name}}(\rho(\text{h}, \text{lab5.hospital}) \bowtie_{\text{h.hospital\_id}=\text{ha.hospital\_id}} (\sigma_{\text{city}=\text{'Ahmedabad'}}(\rho(\text{ha}, \text{hospital\_address}))))$   
 $\Pi_{\text{h.hospital\_name}}(\rho(\text{centers}, \text{h.hospital\_name}) \Join \text{COUNT}(\text{h.hospital\_name})(r1))$

### SQL

```
SELECT h.hospital_name,COUNT(hospital_name) AS centers FROM lab5.hospital as h JOIN
lab5.hospital_address AS ha ON(h.hospital_id=ha.hospital_id) where city='ahmedabad' GROUP BY
h.hospital_name;
```

	hospital_name character varying (20)	centers bigint
1	aims hospital	2
2	medilink hospital	1

**26. Find the total number of centers of ‘medilink hospital’.**

### Relational Algebra

$$r1 \leftarrow \pi_{h.hospital\_name}(\rho(h, lab5.hospital) \bowtie_{<h.hospital\_id=ha.hospital\_id>} (\sigma_{h.hospital\_name='medilink'}(\rho(ha, hospital\_address))))$$

$$\pi_{h.hospital\_name}(\rho(centers, h.hospital\_name) \bowtie_{COUNT(h.hospital\_name)}(r1))$$

### SQL

```
SELECT h.hospital_name,COUNT(h.hospital_name) AS centers FROM lab5.hospital as h JOIN
lab5.hospital_address AS ha ON(h.hospital_id=ha.hospital_id) where h.hospital_name='medilink
hospital' GROUP BY h.hospital_name;
```

	hospital_name character varying (20)	centers bigint
1	medilink hospital	2

## 27. Retrieve the name(s) of hospital(s) that accepts all insurance policy

### Relational Algebra

$r1 \leftarrow \Pi_{ph.hospital\_id, p.insurance\_policy\_id} ((\sigma_{ph.hospital\_id = h.hospital\_id} (\sigma_{ph.private\_hospital\_cases} (P(ph, private\_hospital\_cases))) \times (\sigma_{p.insurance\_policy} (P(p, insurance\_policy))))$

$r2 \leftarrow r1 - (\sigma_{ph.private\_hospital\_cases} (P(ph, private\_hospital\_cases)))$

$r2x \leftarrow \Pi_{hospital\_id} (r2)$

$r3 \leftarrow \Pi_{ph.hospital\_id, h.hospital\_name}$

$((\sigma_{ph.private\_hospital\_cases} (P(ph, private\_hospital\_cases))) \bowtie_{<ph.hospital\_id=h.hospital\_id>} (\sigma_{h.hospital} (P(h, hospital)))) - r2x$

### SQL Query

select distinct ph.hospital\_id, h.hospital\_name from lab5.private\_hospital\_cases as ph



JOIN lab5.hospital as h ON (ph.hospital\_id=h.hospital\_id)

where ph.hospital\_id not in

(  
    select hospital\_id from  
    (  
        select ph.hospital\_id, p.insurance\_policy\_id from lab5.private\_hospital\_cases as ph  
CROSS JOIN lab5.insurance\_policy as p  
        except  
        select hospital\_id, insurance\_policy\_id from lab5.private\_hospital\_cases  
    ) as r2  
)

```
1 select distinct ph.hospital_id, h.hospital_name from lab5.private_hospital_cases as ph
2 JOIN lab5.hospital as h ON (ph.hospital_id=h.hospital_id)
3 where ph.hospital_id not in
4 (
5     select hospital_id from
6     (
7         select ph.hospital_id, p.insurance_policy_id from lab5.private_hospital_cases as ph CROSS JOIN lab5.insurance_policy as p
8         except
9         select hospital_id, insurance_policy_id from lab5.private_hospital_cases
10    ) as r2
11 )
12
```

Data Output   Notifications   Explain   Query History   Messages

	 hospital_id integer	 hospital_name character varying (20)
1	108	aims hospital