GROUP-16

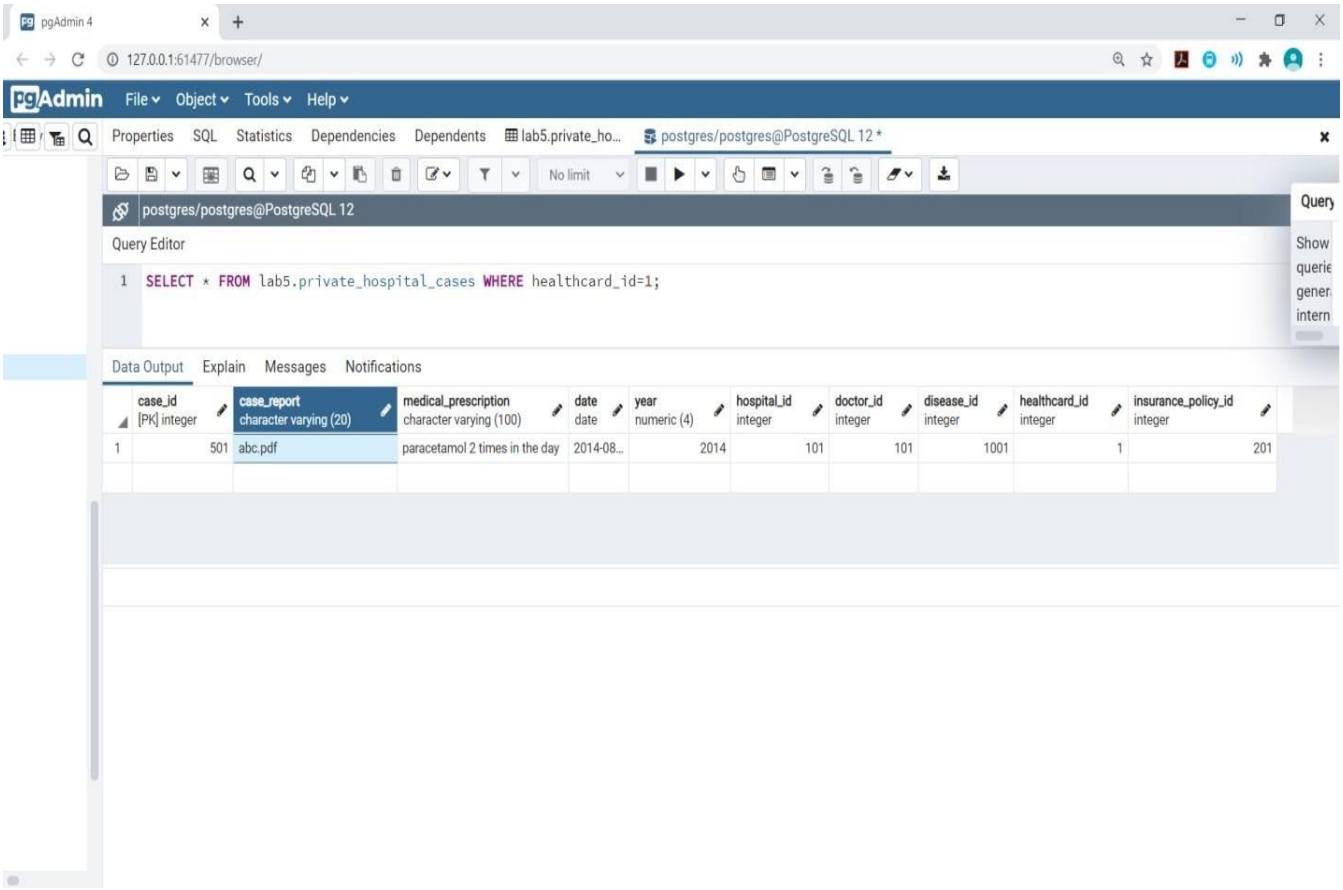
1. Retrieve the medical details of the patient having the healthcard_id=1.

Relational Algebra

Π*(σhealthcard_id=1 (private_hospital_cases))

SQL QUERY

SELECT * FROM lab5.private_hospital_cases WHERE healthcard_id=1;



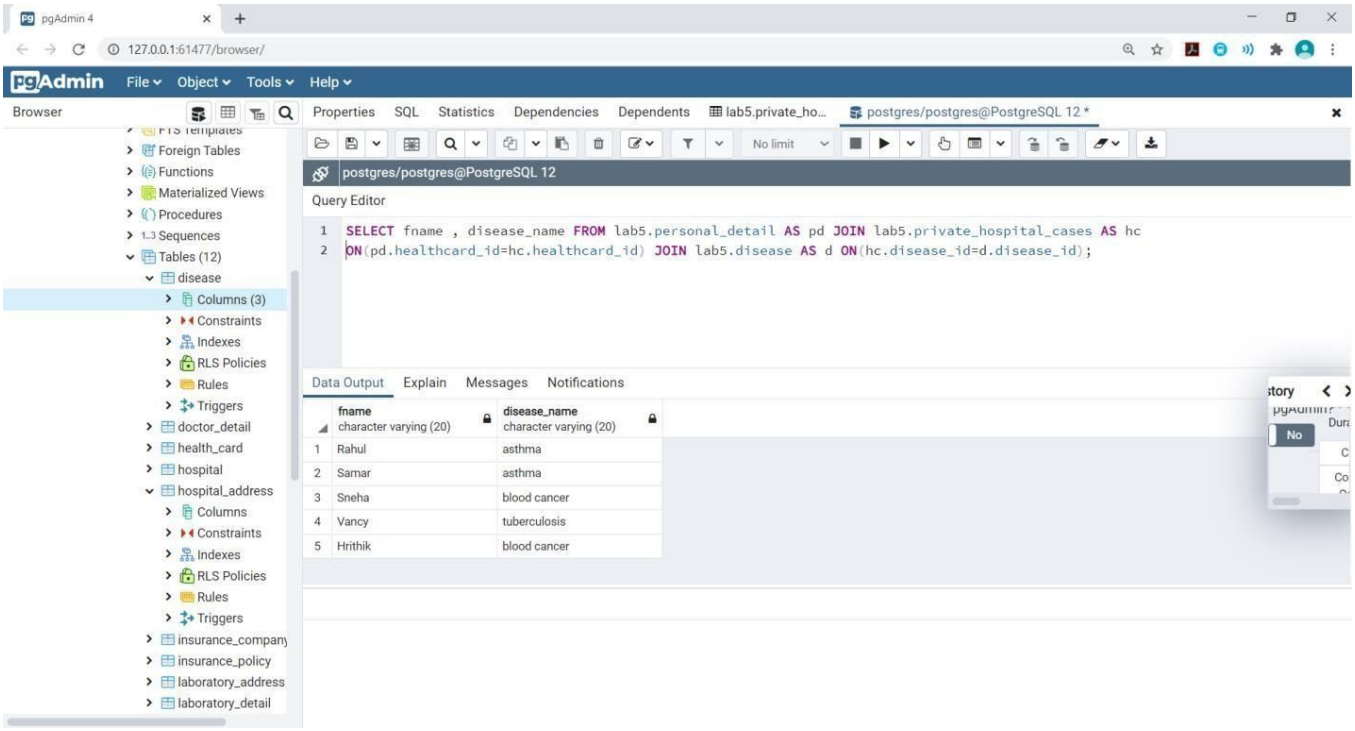
2. Retrieve the names of the patients and the diseases that patient has suffered.

Relational Algebra

Πfname, disease_name (Þ (pd, personal_details) ⋈<pd.healthcard_id=hc.healthcard_id> Þ (hc, personal_hospital_cases) ⋈<hc.disease_id=d.disease_id> Þ (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);



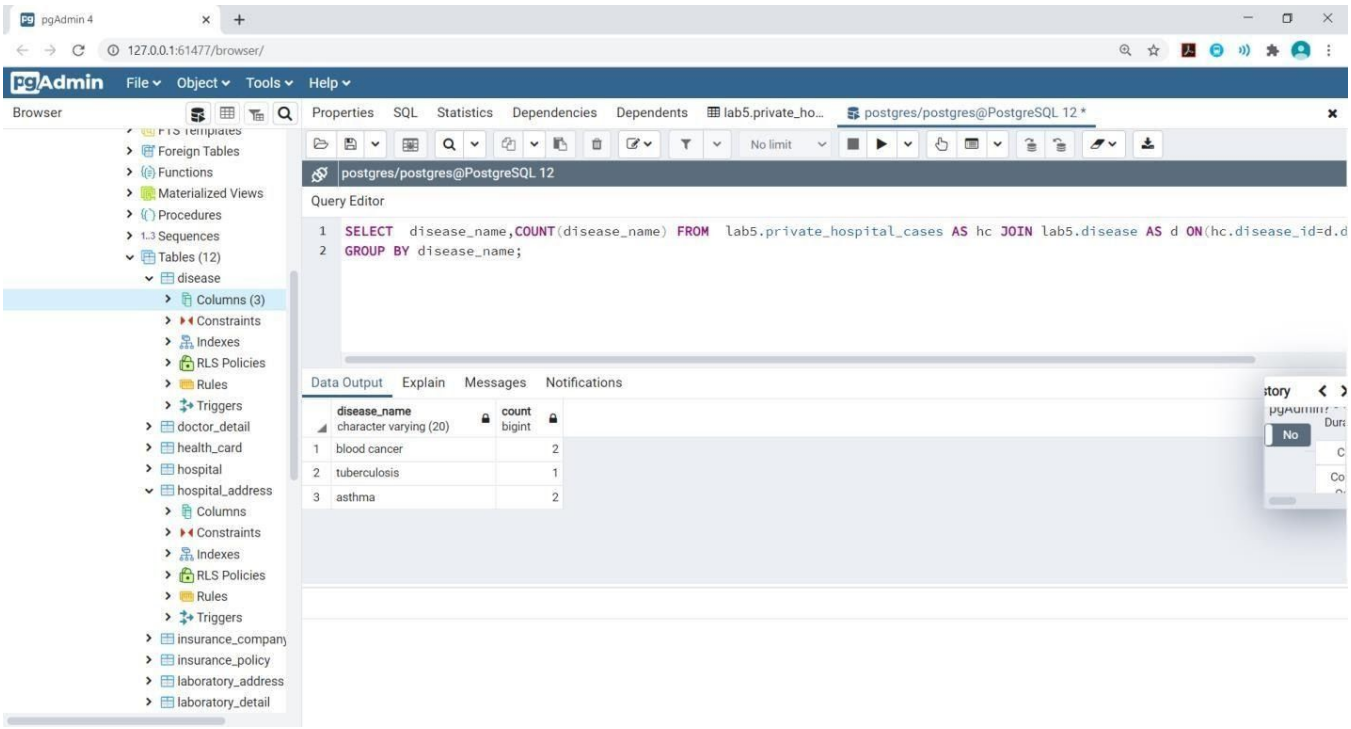
3. Count the number of people suffering from a particular disease.

Relational Algebra

$dis_{ease_name}\mathcal{F}_{COUNT(disease_name)}(Þ$ (hc, personal_hospital_cases) ⋈<hc.disease_id =d.disease_id>(Þ (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;



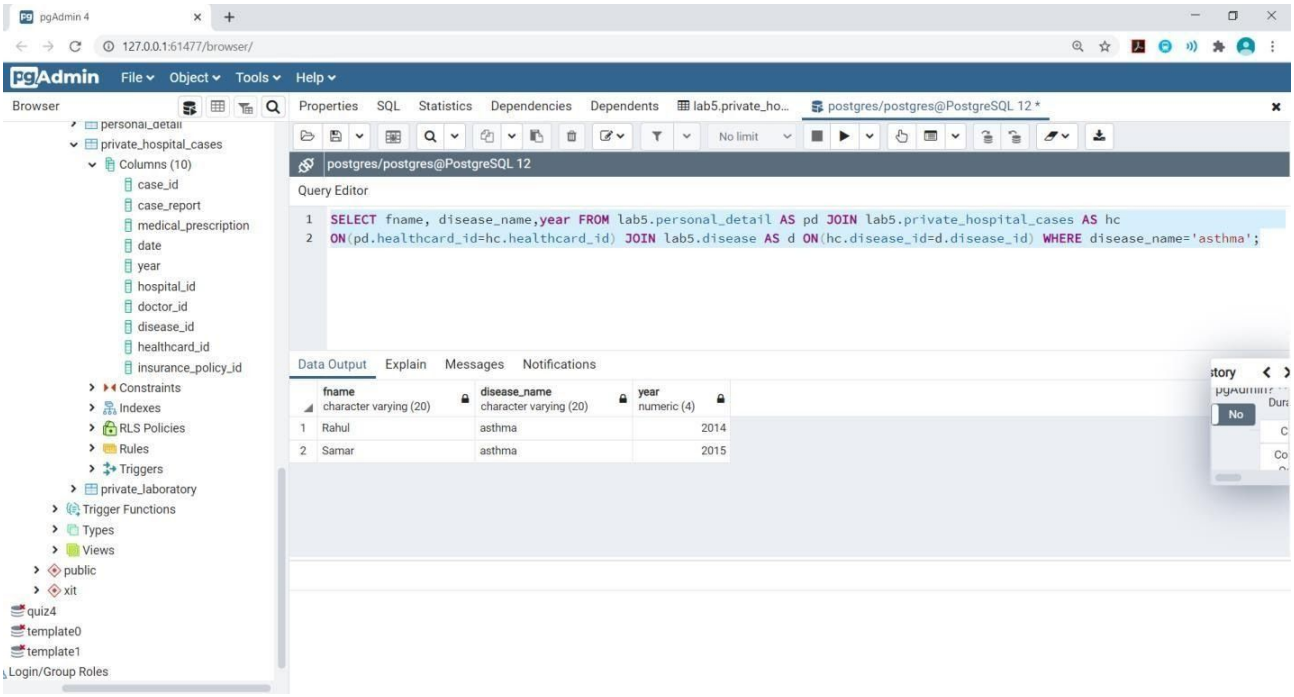
4. Retrieve the names of the patients and the year when they have suffered from the disease ‘asthma’.

Relational Algebra

Πfname_name, disease_name , year (Þ (pd, personal_details) ⋈<pd.healthcard_id= hc.healthcard_id> Þ (hc, private_hospital_cases) ⋈<hc.disease_id= d.disease_id> Þ (d, $\sigma_{disease_name='asthma'}$ (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';



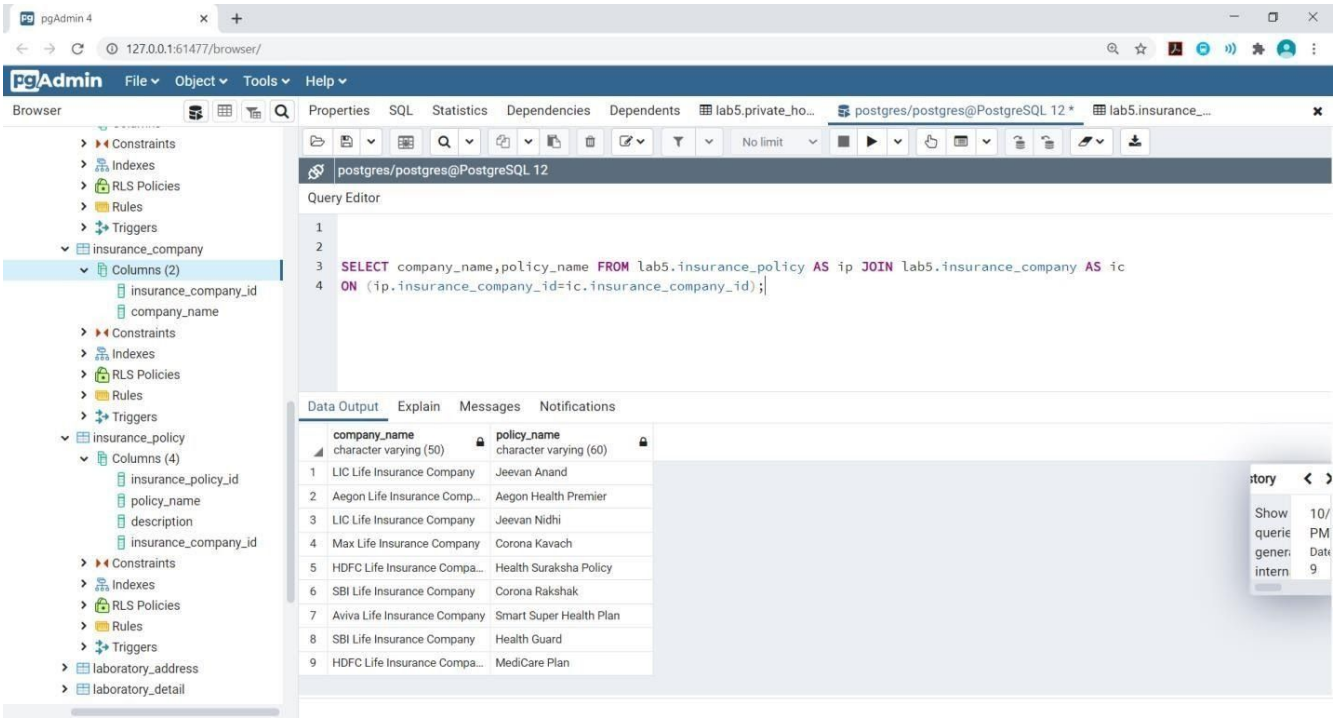
5. Retrieve the names of the insurance companies and the policies provided by them.

Relational Algebra

Πcompany_name, policy_name (Þ (ip, insurance_policy) ⋈<ip.insurance_company_id= ic.insurance_company_id > Þ (ic, 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);



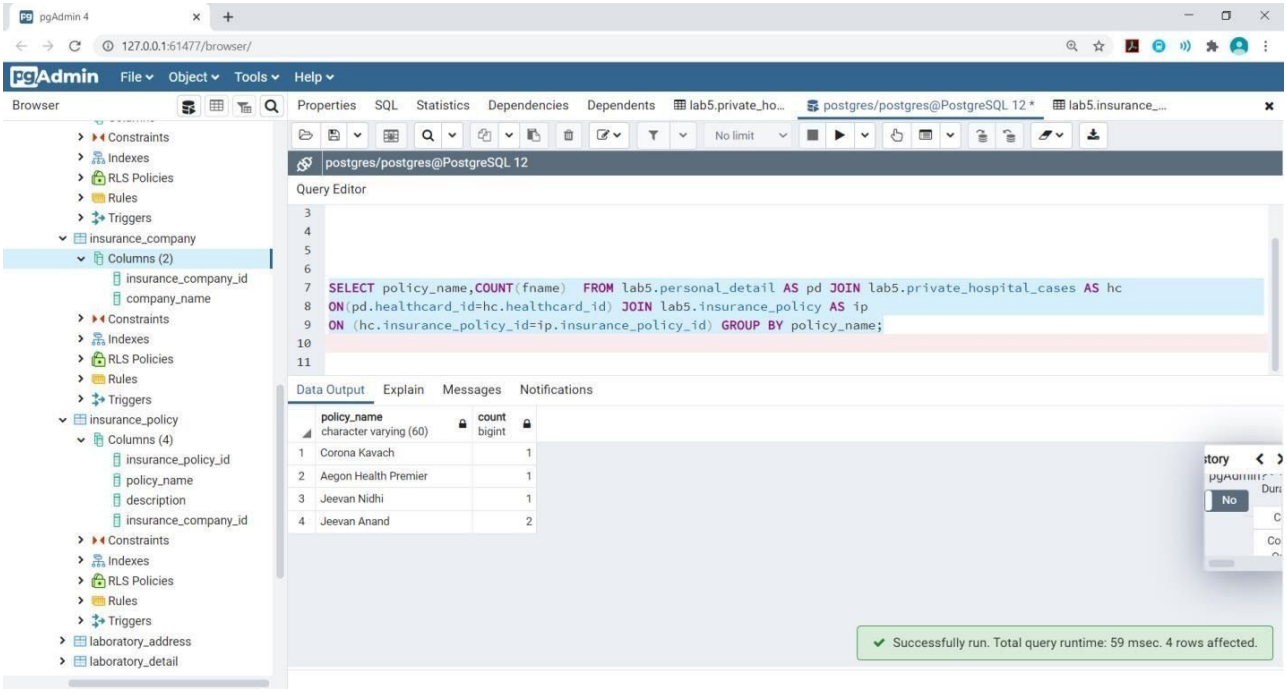
6. Count the number of patients who have taken a particular Insurance Policy.

Relational Algebra

disease_nameF count (fname) (Þ (pd, personal_detail) ⋈<pd.healthcard_id=hc.healthcard_id> Þ (hc, personal_hospital_cases) ⋈<hc.disease_id=d.disease_id> Þ (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;



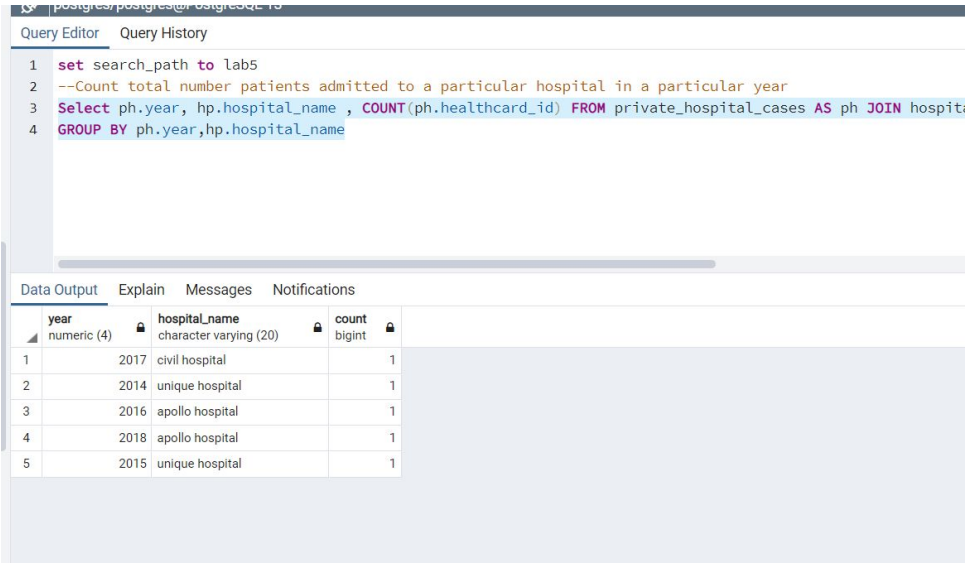
7. Count total number patients admitted to a particular hospital in a particular year

Relational Algebra

ph.year, hp hospital_name𝓕 COUNT (ph.healthcard_id) (Þ (ph, private_hospital_cases) ⋈<ph.hospital_id=hp.hospital_id> Þ (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



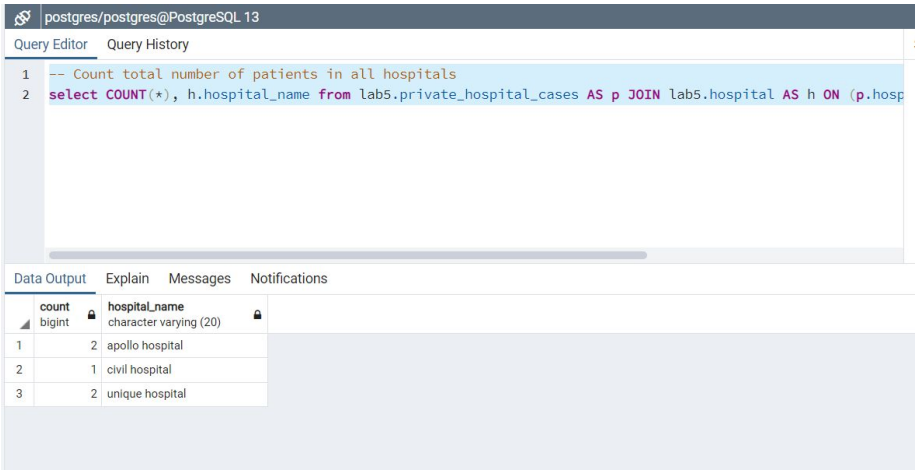
8. Count total number of patients in all hospitals

Relational Algebra

hp.hospital_name𝓕 COUNT (*) (Þ (p, private_hospital_cases) ⋈<p.hospital_id=hp.hospital_id> Þ (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



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

Relational Algebra

Πhospital_name, contact (σhospital_address.state='mp' (hospital ⋈<hospital.hospital_id=hospital_address.hospital_id>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(Þ(dd,lab5.doctor_detail)
⋈<dd.doctor_id=lab5.private_hospital_cases.doctor_id>(σlab5.private_hospital_cases.hospital_id=r1))

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(Þ(h,lab5.hospital)⋈<h.hospital_id=ha.hospital_id>(Þ(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

Πfname,lname,hospital_name,year(Þ(pd,lab5.personal_detail)
⋈<pd.healthcard_id=hc.healthcard_id>Þ (hc, lab5.private_hospital_cases)
⋈<hc.hospital_id=h.hospital_id> Þ (h, σ (year=2014 AND 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

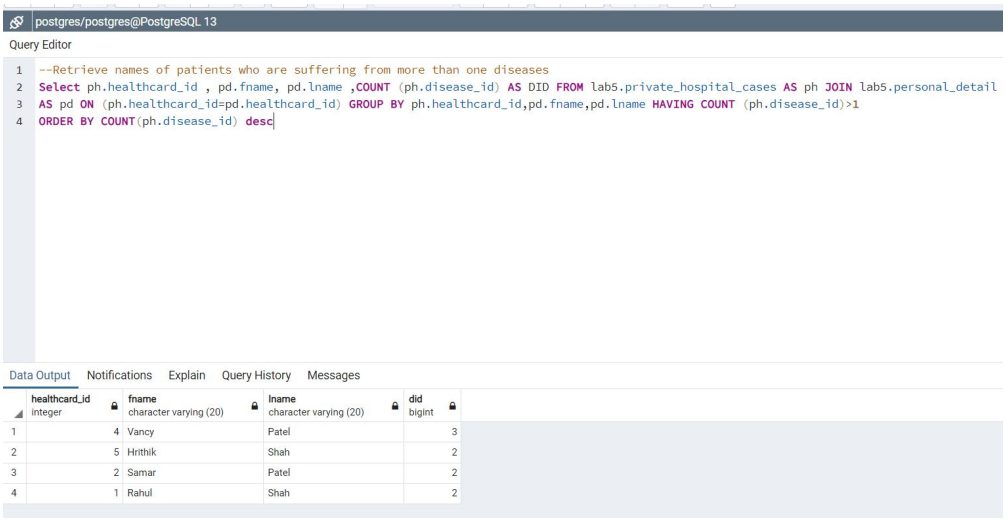
13. Retrieve names of patients who are suffering from more than one diseases

Relational Algebra

R1= ph.healthcard_id, pd.fname, pd.lname𝓕 (Þ (ph, private_hospital_cases))
R2= ϭcount (ph.disease_id)>1(R1)
R3= pd.fname, pd.lname𝓕 (Þ (pd, personal_detail))
Result= Πcount(ph.disease_id)(R2⋈<ph.healthcard_id=pd.healthcard_id>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



14. Retrieve the data of patient of Asthma disease

Relational Algebra

r1<-Πdisease_id (σdisease_name=’asthma’(lab5.disease))
Result<- Result<- Π (*)(lab5.personal_detail)
⋈<lab5.personal_detail.healthcard_id=lab5.private_hospital_cases.healthcard_id>(σlab5.private_hospital_cases.disesase_id=r1))

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	lname	father_name character vary	mother_name character varyi	gender	dob date	address_line1 character varying (100)	address_line2 character varyi	state	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

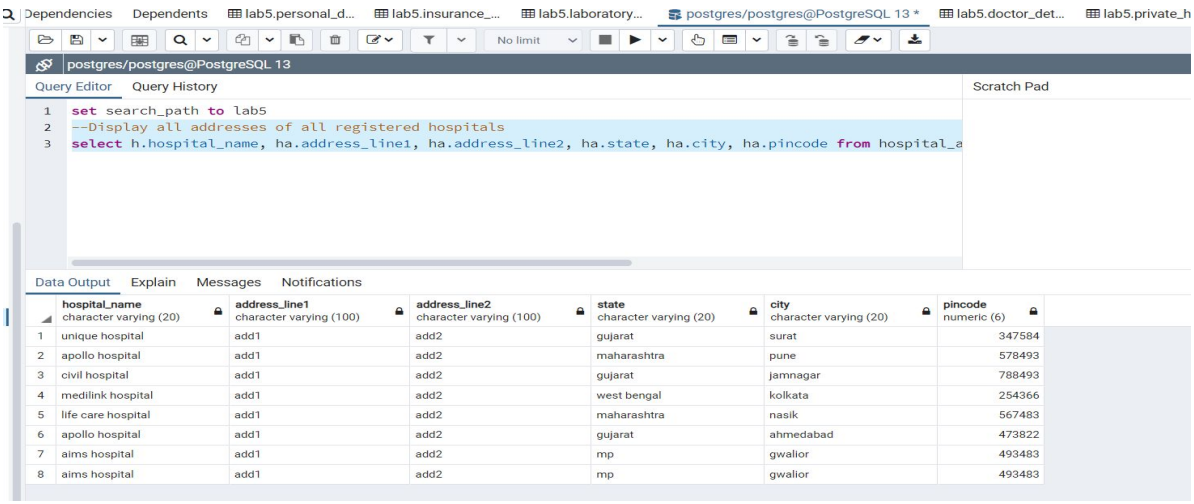
15. Display all addresses of all registered hospitals

Relational Algebra

Πh.hospital_name, ha.address_line1, ha.address_line2, ha.state, ha.city, ha.pincode (Þ (ph, hospital_address) ⋈<ha.hospital_id=h.hospital_id> Þ (h, hospital))

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



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

Relational Algebra

$\Pi_{\text{pd.birth_certificate_id, pd.fname, pd.lname, pd.gender, pd.dob, dd.doctor_name}} (Þ\ (\text{pd, personal_detail})) \bowtie_{\text{<pd.healthcard_id=ph.healthcard_id>}} (Þ\ (\text{ph, private_hospital}))$
$\bowtie_{\text{<ph.doctor_id=dd.doctor_id>}} (6_{\text{ dd.doctor_name='vijay kumar'}}\ (Þ\ (\text{dd, doctor_detail})))$

U

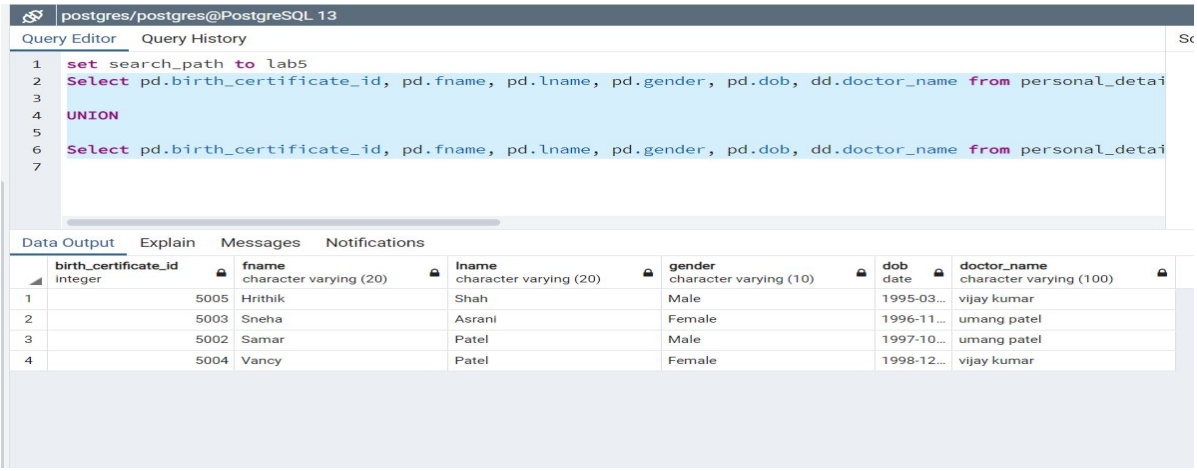
$\Pi_{\text{pd.birth_certificate_id, pd.fname, pd.lname, pd.gender, pd.dob, dd.doctor_name}} (Þ\ (\text{pd, personal_detail})) \bowtie_{\text{<pd.healthcard_id=ph.healthcard_id>}} (Þ\ (\text{ph, private_hospital}))$
$\bowtie_{\text{<ph.doctor_id=dd.doctor_id>}} (6_{\text{ dd.doctor_name='umang patel'}}\ (Þ\ (\text{dd, doctor_detail})))$

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'



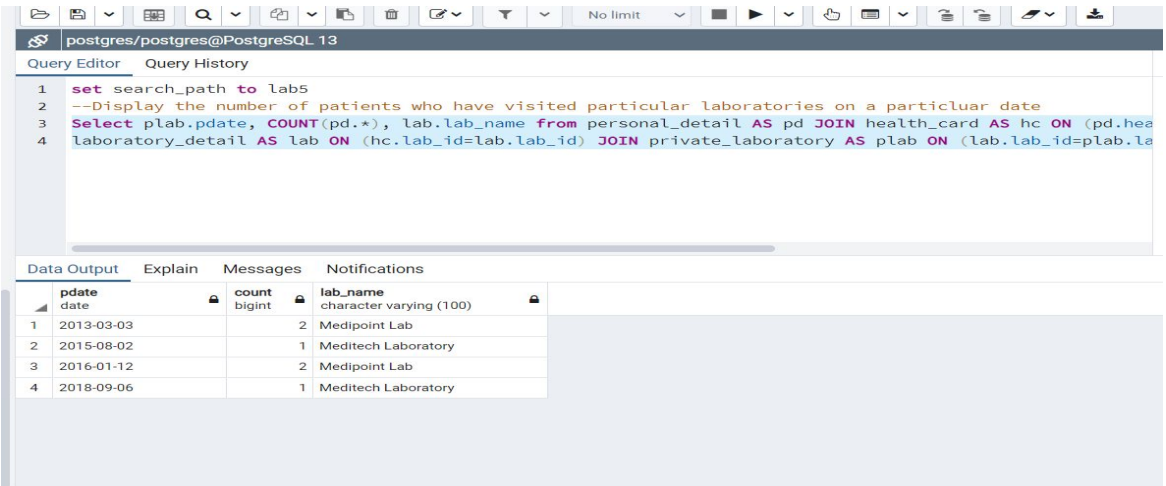
17. Display the number of patients who have visited particular laboratories on a particular date

Relational Algebra

plab.pdate, lab.lab_name $\mathcal{F}_{\text{COUNT (hc.healthcard_id)}}$ (Þ (hc, health_card) $\bowtie_{\text{<hc.lab_id=lab.lab_id>}}$ Þ (lab, laboratory_detail)) $\bowtie_{\text{<lab.lab_id=plab.lab_id>}}$ (Þ (plab, private_laboratory))

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

$_{ph.year,\ d.disease_name}\mathcal{F}_{COUNT\ (ph.disease_id)}$ (Þ (ph, private_hospital_cases) $\bowtie_{<ph.disease_id=d.disease_id>}$ Þ (d, disease))

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

$\Pi_{\ phc.case_id,\ phc.case_report,\ phc.medical_prescription,\ phc.date,\ phc.year,\ h.hospital_name,\ dd.doctor_name,\ d.disease_name}$ ($\sigma_{phc.healthcard_id=3}$((Þ (phc, private_hospital_cases)) $\bowtie_{<phc.hospital_id=h.hospital_id>}$ (Þ (h, hospital)) $\bowtie_{<phc.doctor_id=dd.doctor_id>}$ ((Þ (dd, doctor_detail)) $\bowtie_{<phc.disease_id=d.disease_id>}$ ((Þ (d,disease))))

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

$\Pi_{h.hospital_name,\ phc.case_id, phc.case_report, phc.medical_prescription, phc.date, phc.year, dd.doctor_name, d.disease_name, pd.healthcard_id, pd.fname, pd.lname,}$ $(\sigma_{phc.hospital_id=101}((Þ\ (phc, private_hospital_cases)) \bowtie_{<phc.hospital_id=h.hospital_id>} (Þ\ (h, hospital)) \bowtie_{<phc.doctor_id=dd.doctor_id>} ((Þ\ (dd, doctor_detail)) \bowtie_{<phc.disease_id=d.disease_id>} ((Þ\ (d,disease)) \bowtie_{<phc.healthcard_id=pd.healthcard_id>} ((Þ\ (pd, personal_detail))))$

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

date date	year numeric (4)	doctor_name character varying (20)	disease_name character varying (20)	healthcard_id integer	fname character varying (20)	lname character varying (20)
2014-08-20	2014	rahul sharma	asthma	1	Rahul	Shah
2015-09-04	2015	umang patel	asthma	2	Samar	Patel

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

Relational Algebra

$\Pi_{case_id}(\sigma_{insurance_poicy_id=201}(lab5.private_hospital_cases))$

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

$\sigma_{(*)}(lab5.personal_detail$

$\bowtie_{<lab5.pesonal_detail.healthcard_id= lab5.private_hospital_cases.healthcard_id >}(\sigma_{(lab5.private_hospital_cases.disease_id = 1001)}lab5.private_hospital_cases))$

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 integer	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
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

$\Pi_{lab_name}(laboratory_address \bowtie_{<laboratory_address.lab_id=laboratory_detail.lab_id>} (\sigma_{area='Paldi'}(laboratory_detail)))$

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

$\Pi_{fname,lname}(\rho(pd,personal_detail) \text{⟕}_{<pd.healthcard_id=hc.healthcard_id>}(\sigma_{hc.healthcard_id\ IS\ NULL}$ $\rho(hc,private_hospital_cases)))$

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<- $\Pi_{h.hospital_name}(\rho(h,lab5.hospital) \bowtie_{<h.hospital_id=ha.hospital_id>}(\sigma_{city='Ahmedabad'}(\rho(ha,hospital_address))$
$\Pi_{h.hospital_name}$ $(\rho(centers,{}_{h.hospital_name}\mathcal{F}_{COUNT(h.hospital_name)}(r1))$

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

$r1 \leftarrow -\Pi_{h.hospital_name}(\rho(h,lab5.hospital) \bowtie_{<h.hospital_id=ha.hospital_id>} (\sigma_{h.hospital_name='medilink\ hospital'}(\rho(ha,hospital_address))$

$\Pi_{h.hospital_name}\ (\rho(centers, {}_{h.hospital_name}\mathcal{F}_{COUNT(h.hospital_name)}(r1))$

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 <- $\Pi_{ph.hospital_id,\ p.insurance_policy_id}$ ((Þ (ph, private_hospital_cases)) X (Þ (p, insurance_policy)))

r2 <- r1 – (Þ (ph, private_hospital_cases))

r2x <- hospital_id (r2)

r3 <- $\Pi_{ph.hospital_id,\ h.hospital_name}$

((Þ (ph, private_hospital_cases)) $\bowtie_{<ph.hospital_id=h.hospital_id>}$ (Þ (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
)
```

```sql
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
        except
        select hospital_id, insurance_policy_id from lab5.private_hospital_cases
    ) as r2
)
```

Data Output | Notifications | Explain | Query History | Messages

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