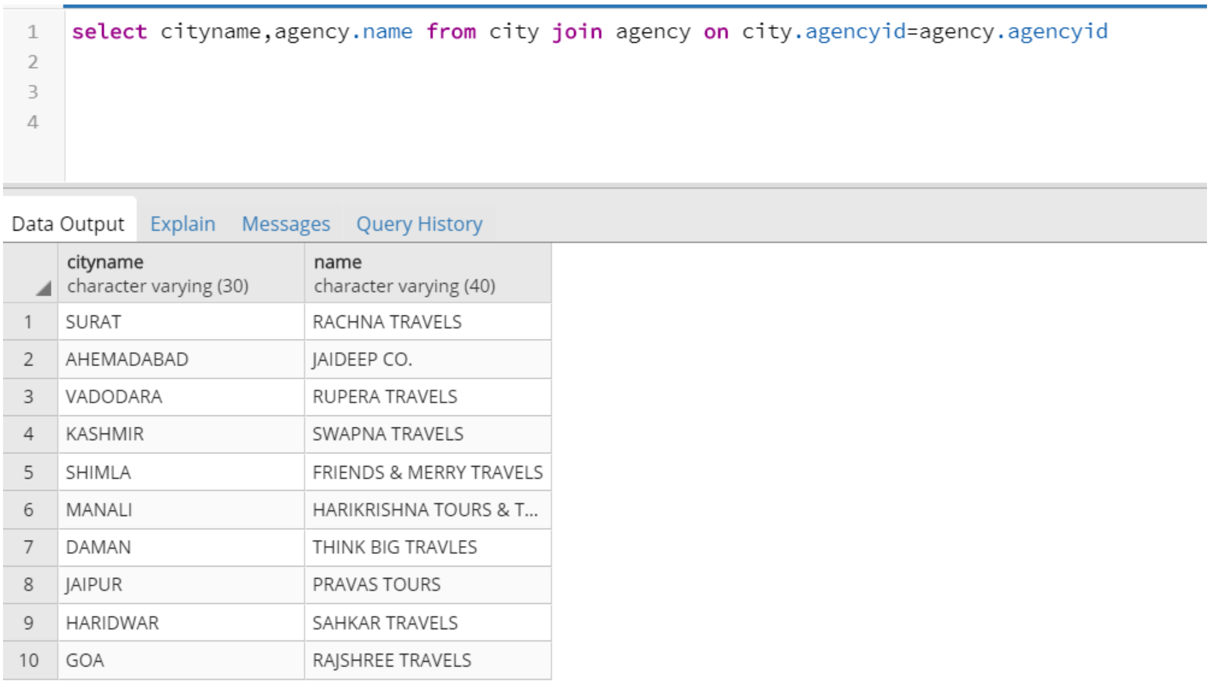
1.Find all agencies with their respective cities.

SQL:

select cityname,agency.name from city join agency on city.agencyid=agency.agencyid

RA:

π<city.cityname,agency.name>(city ⋈<city.agencyid=agency.agencyid> agency)



```
select cityname,agency.name from city join agency on city.agencyid=agency.agencyid
```

	cityname character varying (30)	name character varying (40)
1	SURAT	RACHNA TRAVELS
2	AHEMADABAD	JAIDEEP CO.
3	VADODARA	RUPERA TRAVELS
4	KASHMIR	SWAPNA TRAVELS
5	SHIMLA	FRIENDS & MERRY TRAVELS
6	MANALI	HARIKRISHNA TOURS & T...
7	DAMAN	THINK BIG TRAVLES
8	JAIPUR	PRAVAS TOURS
9	HARIDWAR	SAHKAR TRAVELS
10	GOA	RAJSHREE TRAVELS

2.Find firstname,lastname and ids of passengers who have used ‘LE PLAZA’ package.

SQL:

select passengerid,fname,lname from passenger where groupid in (select groupid from group_package_hotel where hotelid in (select hotelid from hotel where hotel_name='LE PLAZA'));

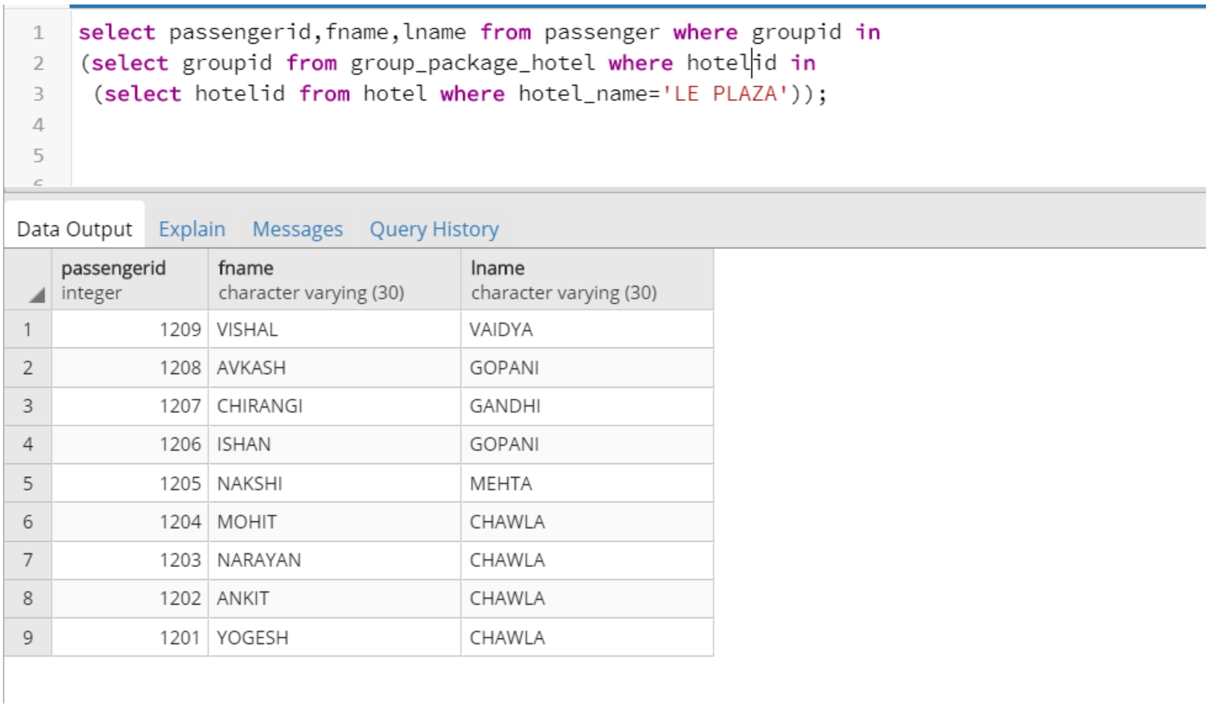
RA:

ρ(p,passenger)

ρ(gph,group_package_hotel)

ρ(h,hotel)

π<passengerid,fname,lname> passenger SEMI-INTERSECTION<p.groupid=gph.groupid>(gph SEMIINTERSECTION <gph.hotelid=h.hotelid> (σ<hotelname='LE PLAZA'>h))



```sql
select passengerid,fname,lname from passenger where groupid in
(select groupid from group_package_hotel where hotelid in
 (select hotelid from hotel where hotel_name='LE PLAZA'));
```

	passengerid integer	fname character varying (30)	lname character varying (30)
1	1209	VISHAL	VAIDYA
2	1208	AVKASH	GOPANI
3	1207	CHIRANGI	GANDHI
4	1206	ISHAN	GOPANI
5	1205	NAKSHI	MEHTA
6	1204	MOHIT	CHAWLA
7	1203	NARAYAN	CHAWLA
8	1202	ANKIT	CHAWLA
9	1201	YOGESH	CHAWLA

3. .List of the hotel and package used by all groups

SQL:

select distinct passenger.groupid,hotel.hotel_name,package.pname from passenger join group_package_hotel on passenger.groupid=group_package_hotel.groupid join hotel on group_package_hotel.hotelid=hotel.hotelid join package on group_package_hotel.packageid=package.packageid

RA:

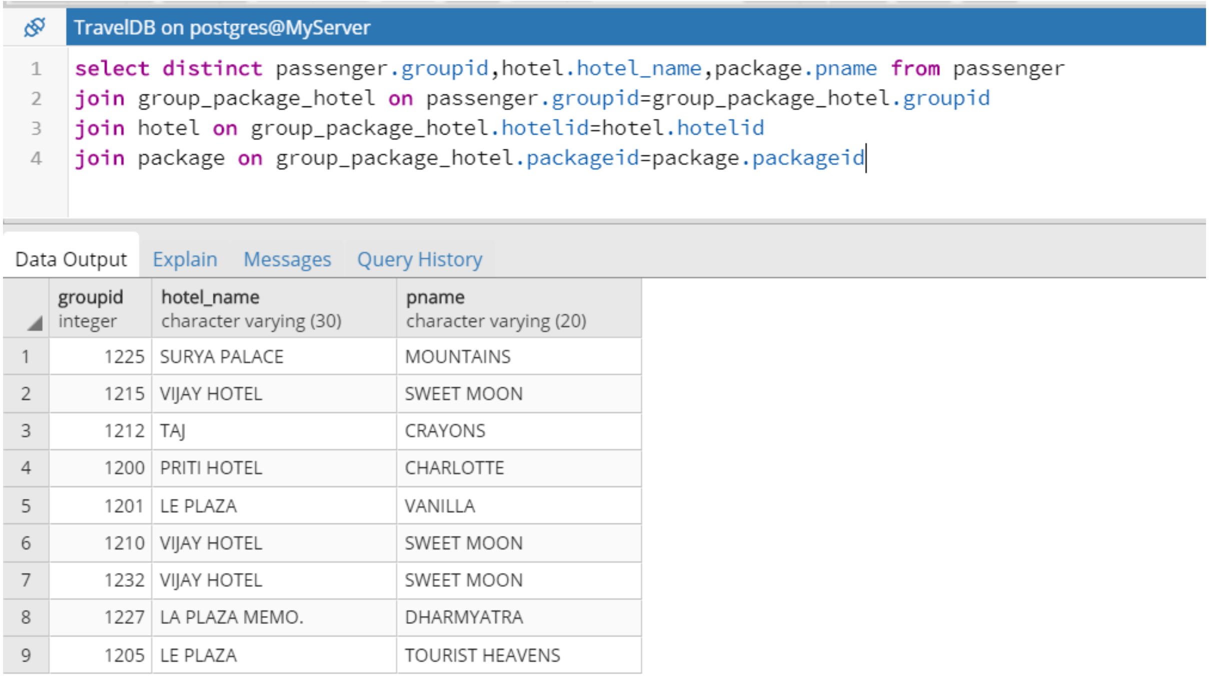
ρ(pass,passenger)

ρ(gph,group_package_hotel)

ρ(h,hotel)

ρ(pack,package)

π<pass.groupid,h.hotel_name,pack.pname>(pass ⋈<pass.groupid=gph.groupid> gph ⋈<gph.hotelid=h.hotelid> hotel ⋈<gph.packageid=pack.packageid> package)



```
select distinct passenger.groupid,hotel.hotel_name,package.pname from passenger
join group_package_hotel on passenger.groupid=group_package_hotel.groupid
join hotel on group_package_hotel.hotelid=hotel.hotelid
join package on group_package_hotel.packageid=package.packageid
```

	groupid integer	hotel_name character varying (30)	pname character varying (20)
1	1225	SURYA PALACE	MOUNTAINS
2	1215	VIJAY HOTEL	SWEET MOON
3	1212	TAJ	CRAYONS
4	1200	PRITI HOTEL	CHARLOTTE
5	1201	LE PLAZA	VANILLA
6	1210	VIJAY HOTEL	SWEET MOON
7	1232	VIJAY HOTEL	SWEET MOON
8	1227	LA PLAZA MEMO.	DHARMYATRA
9	1205	LE PLAZA	TOURIST HEAVENS

4.Find out the passengers who have paid with cash and gone to ‘SWEET MOON’ package.

SQL:

select fname,lname from passenger join booking on passenger.groupid=booking.groupid join ticket on booking.bookingid=ticket.bookingid join payment on (ticket.ticketno=payment.ticketno and payment.payment_mode='CASH') join package on (booking.packageid=package.packageid and package.pname='SWEET MOON')

RA:

ρ(pass,passenger)

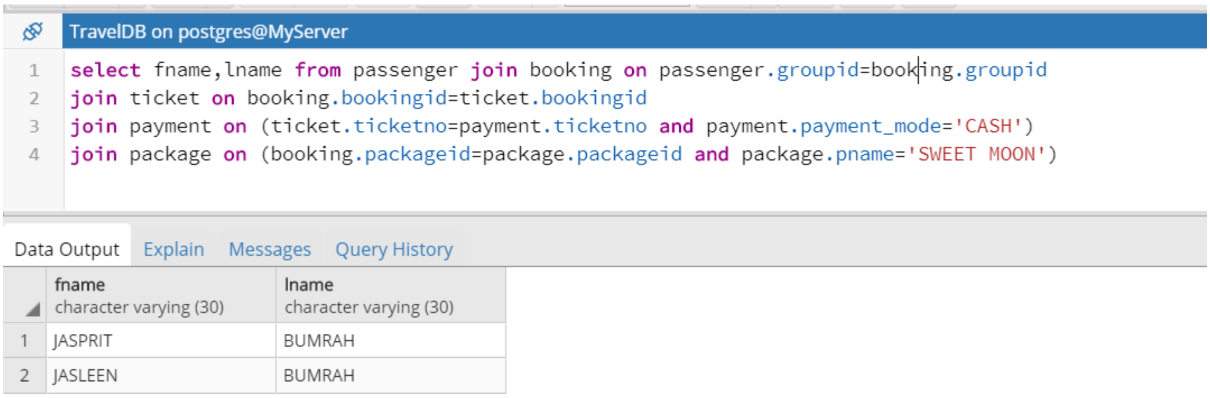
ρ(b,booking)

ρ(pay,payment)

ρ(pack,package)

ρ(t,ticket)

π<pass.fname,pass.lname > (pass ⋈<pass.groupid=b.groupid> b ⋈<b.bookingid=t.bookingid> t ⋈<t.ticketno=pay.ticketno and pay.payment_mode=’CASH’> pay ⋈<b.packageid=pack.packageid and pack.pname=’SWEET MOON’> pack)



```
select fname,lname from passenger join booking on passenger.groupid=booking.groupid
join ticket on booking.bookingid=ticket.bookingid
join payment on (ticket.ticketno=payment.ticketno and payment.payment_mode='CASH')
join package on (booking.packageid=package.packageid and package.pname='SWEET MOON')
```

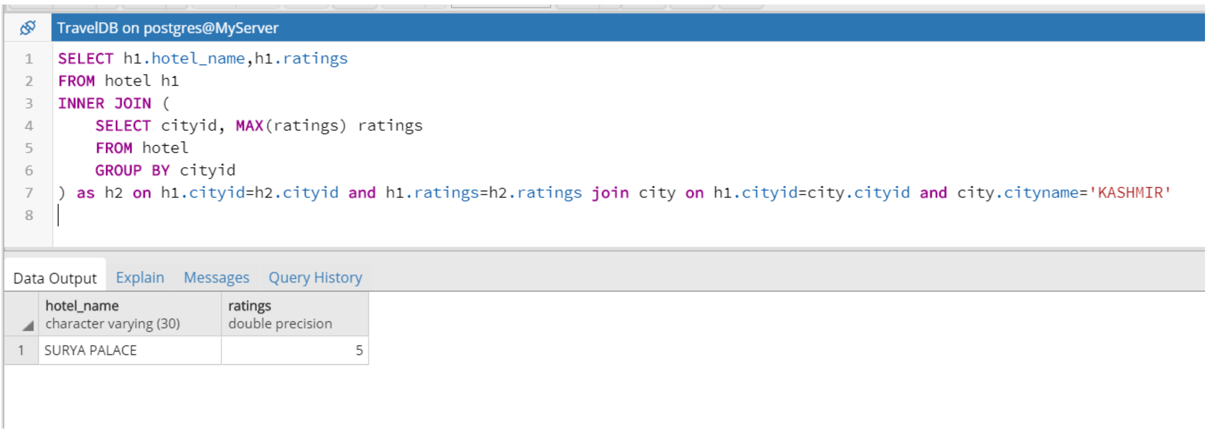
	fname character varying (30)	lname character varying (30)
1	JASPRIT	BUMRAH
2	JASLEEN	BUMRAH

5.Find out the hotel which has maximum ratings in city of Kashmir.

SQL:

RA:

π<h1.hotel_name,h1.ratings > h1 ⋈<h1.cityid=h2.cityid and h1.ratings=h2.ratings> ρ(h2,(cityid ℱmax(ratings)->ratings (hotel))) ⋈<h1.cityid=city.cityid and city.cityname=’KASHMIR’> city



```
SELECT h1.hotel_name,h1.ratings
FROM hotel h1
INNER JOIN (
    SELECT cityid, MAX(ratings) ratings
    FROM hotel
    GROUP BY cityid
) as h2 on h1.cityid=h2.cityid and h1.ratings=h2.ratings join city on h1.cityid=city.cityid and city.cityname='KASHMIR'
```

	hotel_name character varying (30)	ratings double precision
1	SURYA PALACE	5

6. Show the package information along with the no_of_times they have been availed (in descending order)

SQL:

select p.*,(select count(packageid) as no_of_uses from group_package_hotel as gph where gph.packageid=p.packageid) from package as p order by no_of_uses desc;

RA:

ρ(p,package)

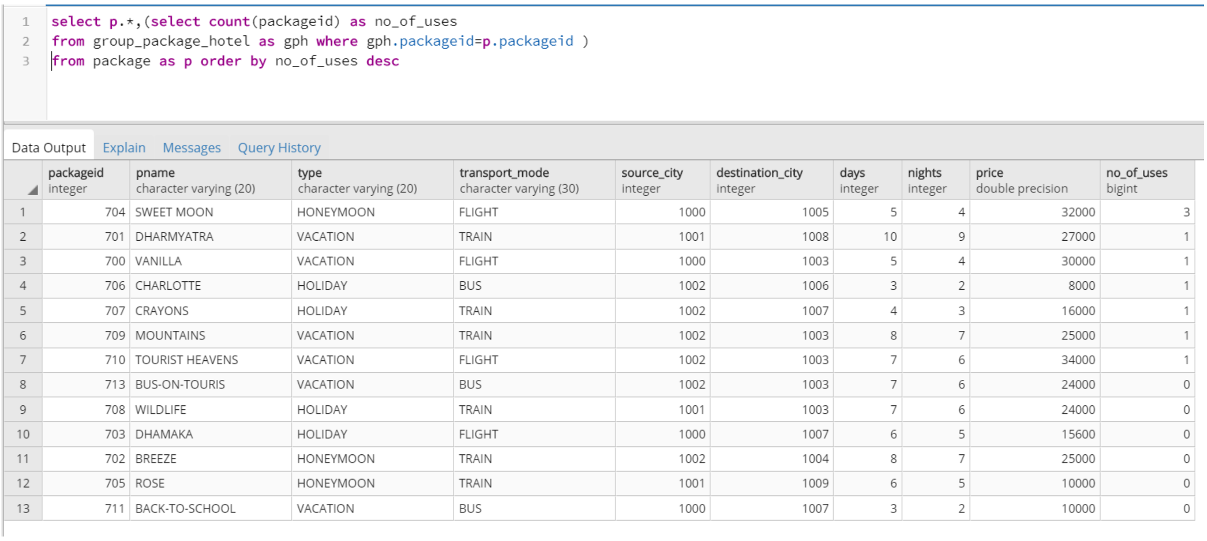
ρ(gph,group_package_hotel)

r1 <- gph

r2 <- σ<gph.packageid=p.packageid>(r1)

r3 <-ℱ count(packageid)->no_of_uses(r2)

π<p.*,r3>(p)



```
select p.*,(select count(packageid) as no_of_uses
from group_package_hotel as gph where gph.packageid=p.packageid )
from package as p order by no_of_uses desc
```

	packageid	pname	type	transport_mode	source_city	destination_city	days	nights	price	no_of_uses
	integer	character varying (20)	character varying (20)	character varying (30)	integer	integer	integer	integer	double precision	bigint
1	704	SWEET MOON	HONEYMOON	FLIGHT	1000	1005	5	4	32000	3
2	701	DHARMYATRA	VACATION	TRAIN	1001	1008	10	9	27000	1
3	700	VANILLA	VACATION	FLIGHT	1000	1003	5	4	30000	1
4	706	CHARLOTTE	HOLIDAY	BUS	1002	1006	3	2	8000	1
5	707	CRAYONS	HOLIDAY	TRAIN	1002	1007	4	3	16000	1
6	709	MOUNTAINS	VACATION	TRAIN	1002	1003	8	7	25000	1
7	710	TOURIST HEAVENS	VACATION	FLIGHT	1002	1003	7	6	34000	1
8	713	BUS-ON-TOURIS	VACATION	BUS	1002	1003	7	6	24000	0
9	708	WILDLIFE	HOLIDAY	TRAIN	1001	1003	7	6	24000	0
10	703	DHAMAKA	HOLIDAY	FLIGHT	1000	1007	6	5	15600	0
11	702	BREEZE	HONEYMOON	TRAIN	1002	1004	8	7	25000	0
12	705	ROSE	HONEYMOON	TRAIN	1001	1009	6	5	10000	0
13	711	BACK-TO-SCHOOL	VACATION	BUS	1000	1007	3	2	10000	0

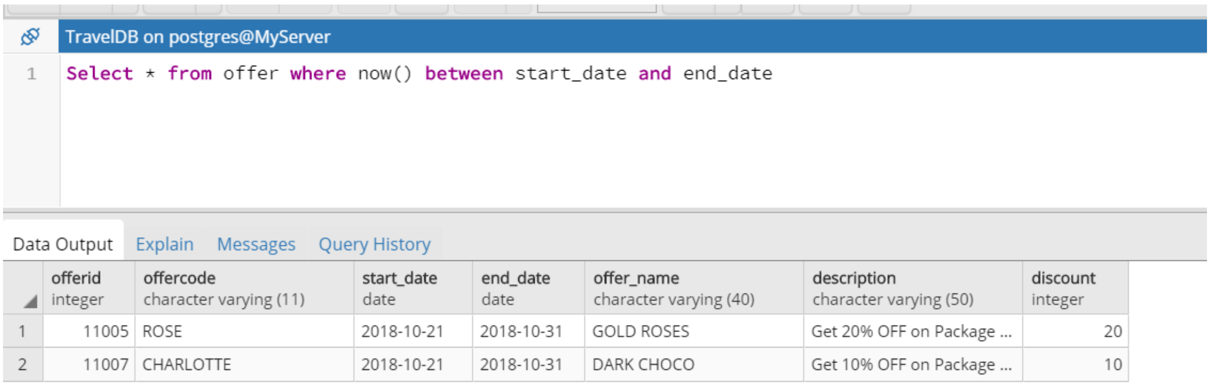
7. Show all the package offers that are currently active.

SQL:

Select * from offer where now() between start_date and end_date

RA:

σ< start_date<=now() and end_date>=now() >(offer)



```
Select * from offer where now() between start_date and end_date
```

	offerid	offercode	start_date	end_date	offer_name	description	discount
	integer	character varying (11)	date	date	character varying (40)	character varying (50)	integer
1	11005	ROSE	2018-10-21	2018-10-31	GOLD ROSES	Get 20% OFF on Package ...	20
2	11007	CHARLOTTE	2018-10-21	2018-10-31	DARK CHOCO	Get 10% OFF on Package ...	10

8. Show all the package offers that will be active for at least a month.

SQL:

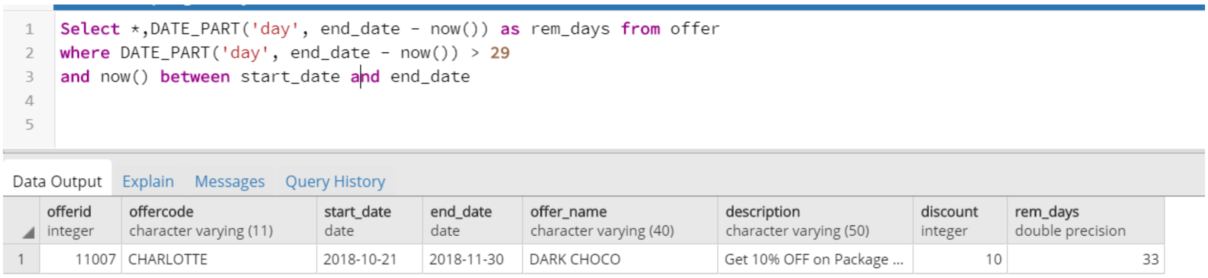
Select *,DATE_PART('day', end_date - now()) as rem_days from offer where DATE_PART('day', end_date - now()) > 29 and now() between start_date and end_date

RA:

r1 <- σ< start_date<=now() and end_date >=now() and DATE_PART('day', end_date - now()) > 29 > (offer)

r2 <- π< offer.*, DATE_PART('day', end_date - now()) > (r1)

ρ(offer(offer.*,rem_days), r2)



```
Select *,DATE_PART('day', end_date - now()) as rem_days from offer
where DATE_PART('day', end_date - now()) > 29
and now() between start_date and end_date
```

	offerid	offercode	start_date	end_date	offer_name	description	discount	rem_days
	integer	character varying (11)	date	date	character varying (40)	character varying (50)	integer	double precision
1	11007	CHARLOTTE	2018-10-21	2018-11-30	DARK CHOCO	Get 10% OFF on Package ...	10	33

9.Find out the passengers who have given more than 2 feedbacks also list the feedbacks.

select pp.fname,pp.lname,pp.passengerid,pp.gender,f.msg from passenger pp join passenger_feedback pf on pp.passengerid=pf.passengerid join feedback f on f.feedbackid=pf.feedbackid and 2 < (select count(feedbackid) from passenger_feedback as pf where pf.passengerid=pp.passengerid)

RA:

ρ(pp,passenger)

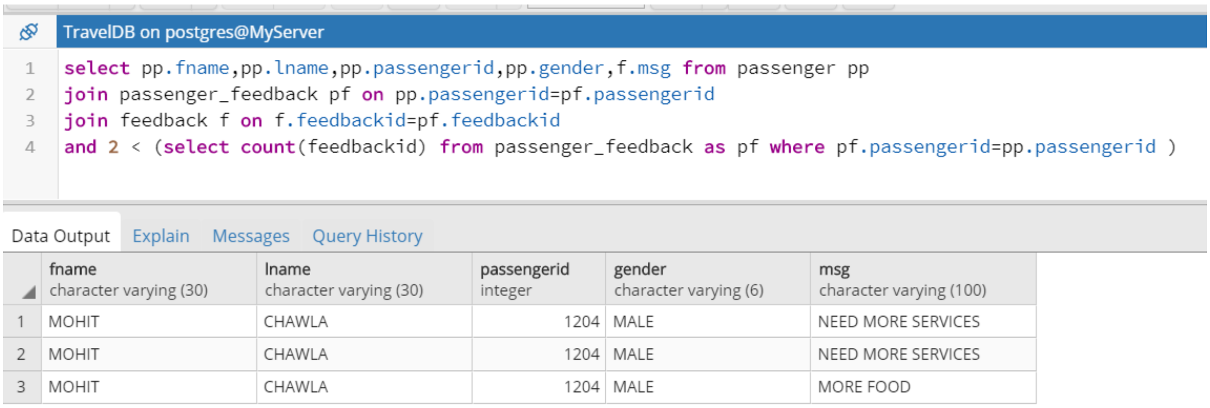
ρ(pf,passenger_feedback)

ρ(f,feedback)

r1<- σ<pf.passengerid=pp.passengerid >(pf)

r2<- 𝓕count(feedbackid)(r1)

π<pp.fname,pp.lname,pp.passengerid,pp.gender,f.msg >(pp ⋈ <pf.passengerid=pp.passengerid> pf ⋈ <f.feedbackid=pf.feedbackid and 2 < (r2)> (f))



```
select pp.fname,pp.lname,pp.passengerid,pp.gender,f.msg from passenger pp
join passenger_feedback pf on pp.passengerid=pf.passengerid
join feedback f on f.feedbackid=pf.feedbackid
and 2 < (select count(feedbackid) from passenger_feedback as pf where pf.passengerid=pp.passengerid )
```

	fname character varying (30)	lname character varying (30)	passengerid integer	gender character varying (6)	msg character varying (100)
1	MOHIT	CHAWLA	1204	MALE	NEED MORE SERVICES
2	MOHIT	CHAWLA	1204	MALE	NEED MORE SERVICES
3	MOHIT	CHAWLA	1204	MALE	MORE FOOD

10. List out the passengers who have taken insurance with their source city.

SQL:

select pp.passengerid,pp.fname,city.cityname from passenger pp join group_package_hotel gph on pp.groupid=gph.groupid join package pack on gph.packageid=pack.packageid join city on pack.source_city=city.cityid and pp.insuranceid is not NULL order by fname

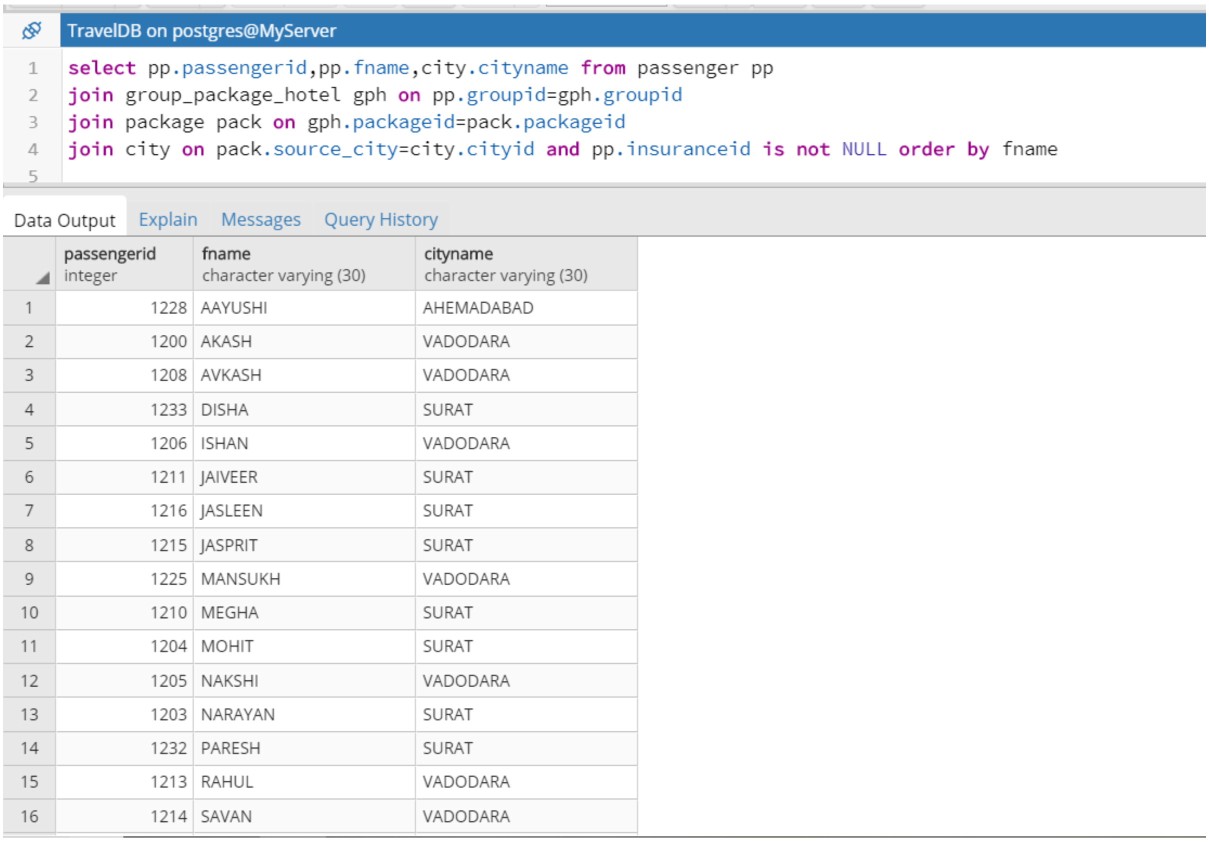
RA:

ρ(pp,passenger)

ρ(gph,group_package_hotel)

ρ(pack,package)

π< pp.passengerid,pp.fname,city.cityname >(pp ⋈ < pp.groupid=gph.groupid> gph ⋈ <gph.packageid=pack.packageid> pack ⋈ < pack.source_city=city.cityid and pp.insuranceid != NULL> city)



```
select pp.passengerid,pp.fname,city.cityname from passenger pp
join group_package_hotel gph on pp.groupid=gph.groupid
join package pack on gph.packageid=pack.packageid
join city on pack.source_city=city.cityid and pp.insuranceid is not NULL order by fname
```

	passengerid integer	fname character varying (30)	cityname character varying (30)
1	1228	AAYUSHI	AHEMADABAD
2	1200	AKASH	VADODARA
3	1208	AVKASH	VADODARA
4	1233	DISHA	SURAT
5	1206	ISHAN	VADODARA
6	1211	JAIVEER	SURAT
7	1216	JASLEEN	SURAT
8	1215	JASPRIT	SURAT
9	1225	MANSUKH	VADODARA
10	1210	MEGHA	SURAT
11	1204	MOHIT	SURAT
12	1205	NAKSHI	VADODARA
13	1203	NARAYAN	SURAT
14	1232	PARESH	SURAT
15	1213	RAHUL	VADODARA
16	1214	SAVAN	VADODARA

11. List cities' information according to number of times they have been visited in descending order.

SQL:

select city.cityid,city.cityname,city.agencyid,count(cityid) as no_of_visits from group_package_hotel gph join package pack on gph.packageid=pack.packageid join city on pack.destination_city=city.cityid group by cityname,cityid order by count(cityname) desc;

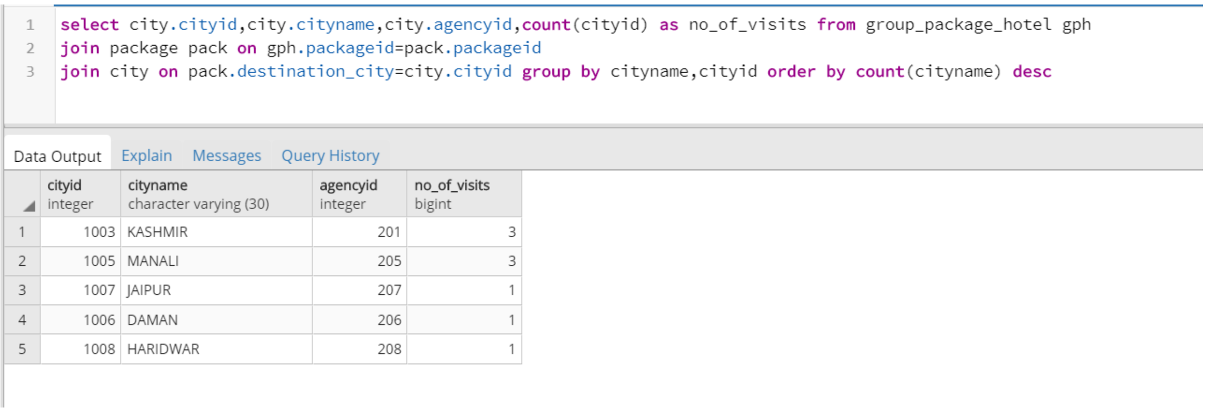
RA:

ρ(gph,group_package_hotel)

ρ(pack,package)

r1<-gph ⋈ <gph.packageid=pack.packageid> pack ⋈ <pack.destination_city=city.cityid> city

π< city.cityid,city.cityname,city.agencyid,count(cityid)> (cityname,cityid $\mathcal{F}$ count(cityid)(r1))



```
select city.cityid,city.cityname,city.agencyid,count(cityid) as no_of_visits from group_package_hotel gph
join package pack on gph.packageid=pack.packageid
join city on pack.destination_city=city.cityid group by cityname,cityid order by count(cityname) desc
```

	cityid integer	cityname character varying (30)	agencyid integer	no_of_visits bigint
1	1003	KASHMIR	201	3
2	1005	MANALI	205	3
3	1007	JAIPUR	207	1
4	1006	DAMAN	206	1
5	1008	HARIDWAR	208	1

12. Display all available destination cities passengers can go to along with the respective agency’s information

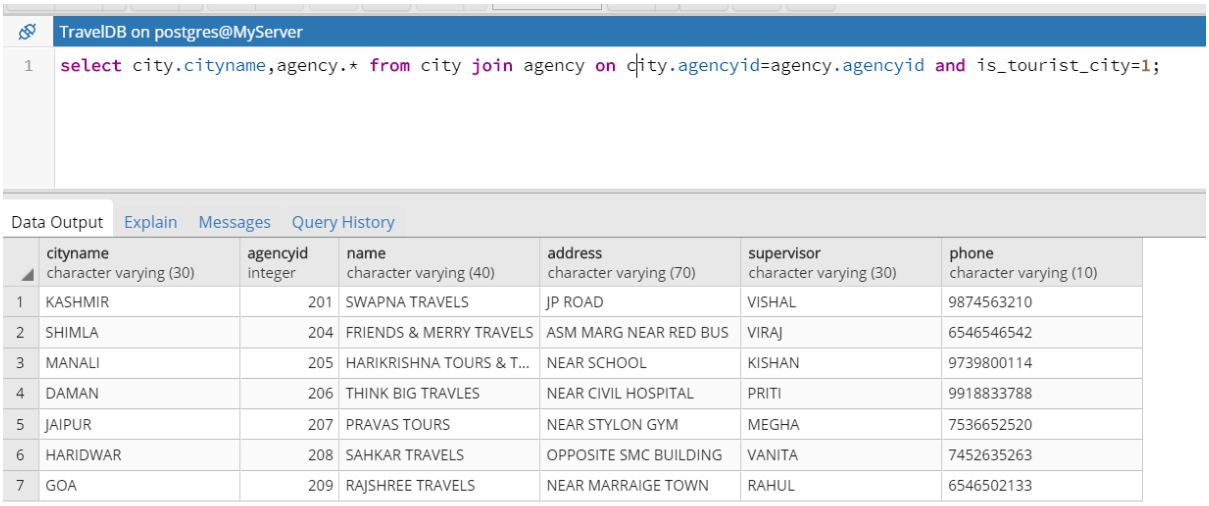
SQL:

select city.cityname,agency.* from city join agency on city.agencyid=agency.agencyid and is_tourist_city=1;

RA:

π< city.cityname,agency.*> (city ⋈< city.agencyid=agency.agencyid and is_tourist_city=1>

agency)



```
select city.cityname,agency.* from city join agency on city.agencyid=agency.agencyid and is_tourist_city=1;
```

	cityname character varying (30)	agencyid integer	name character varying (40)	address character varying (70)	supervisor character varying (30)	phone character varying (10)
1	KASHMIR	201	SWAPNA TRAVELS	JP ROAD	VISHAL	9874563210
2	SHIMLA	204	FRIENDS & MERRY TRAVELS	ASM MARG NEAR RED BUS	VIRAJ	6546546542
3	MANALI	205	HARIKRISHNA TOURS & T...	NEAR SCHOOL	KISHAN	9739800114
4	DAMAN	206	THINK BIG TRAVLES	NEAR CIVIL HOSPITAL	PRITI	9918833788
5	JAIPUR	207	PRAVAS TOURS	NEAR STYLON GYM	MEGHA	7536652520
6	HARIDWAR	208	SAHKAR TRAVELS	OPPOSITE SMC BUILDING	VANITA	7452635263
7	GOA	209	RAJSHREE TRAVELS	NEAR MARRAIGE TOWN	RAHUL	6546502133

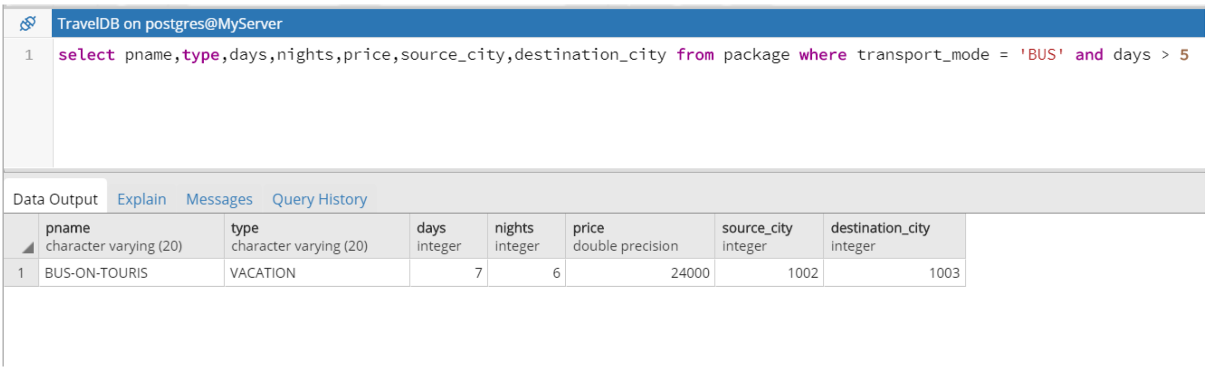
13. .Display all packages’ information having transport as ‘BUS’ and at least 5 days duration .

SQL:

select pname,type,days,nights,price,source_city,destination_city from package where transport_mode = 'BUS' and days > 5

RA:

π<pname,type,days,nights,price,source_city,destination_city > σ< transport_mode = 'BUS' and days > 5 >



TravelDB on postgres@MyServer

```
select pname,type,days,nights,price,source_city,destination_city from package where transport_mode = 'BUS' and days > 5
```

Data Output | Explain | Messages | Query History

	pname character varying (20)	type character varying (20)	days integer	nights integer	price double precision	source_city integer	destination_city integer
1	BUS-ON-TOURIS	VACATION	7	6	24000	1002	1003

14. Display passenger information for passenger who has given a lengthy feedback(at least of length 50 characters) along with the feedback message.

SQL:

select pass.*,f.msg from passenger as pass join passenger_feedback pf on pass.passengerid=pf.passengerid join feedback as f on pf.feedbackid=f.feedbackid and length(f.msg)>=50

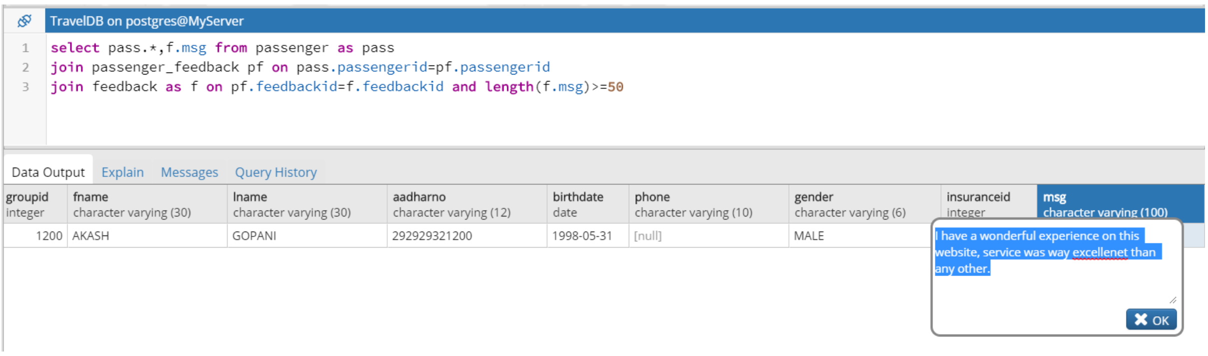
RA:

ρ(pass,passenger)

ρ(f,feedback)

ρ(pf,package_feedback)

π<pass.*,f.msg > (pass ⋈<pass.passengerid=pf.passengerid> pf ⋈<pf.feedbackid=f.feedbackid and length(f.msg)>=50 > f)



TravelDB on postgres@MyServer

```
select pass.*,f.msg from passenger as pass
join passenger_feedback pf on pass.passengerid=pf.passengerid
join feedback as f on pf.feedbackid=f.feedbackid and length(f.msg)>=50
```

Data Output | Explain | Messages | Query History

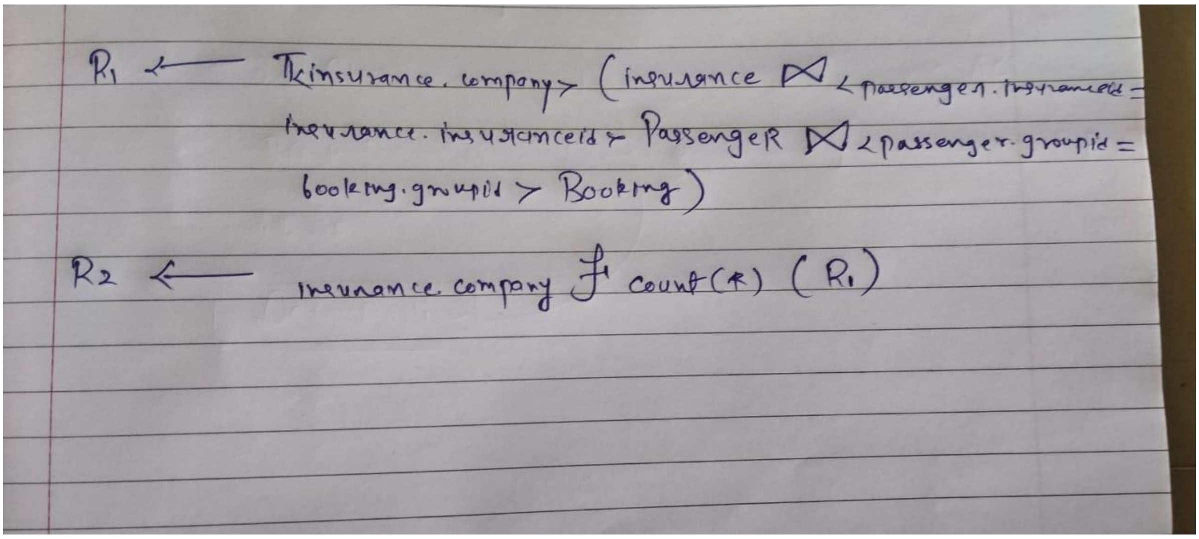
groupid integer	fname character varying (30)	lname character varying (30)	aadharno character varying (12)	birthdate date	phone character varying (10)	gender character varying (6)	insuranceid integer	msg character varying (100)
1200	AKASH	GOPANI	292929321200	1998-05-31	[null]	MALE		I have a wonderful experience on this website, service was way excellenet than any other.

15.Retrive the name of the insurance company which has been chosen by the most number of passengers.

SQL:

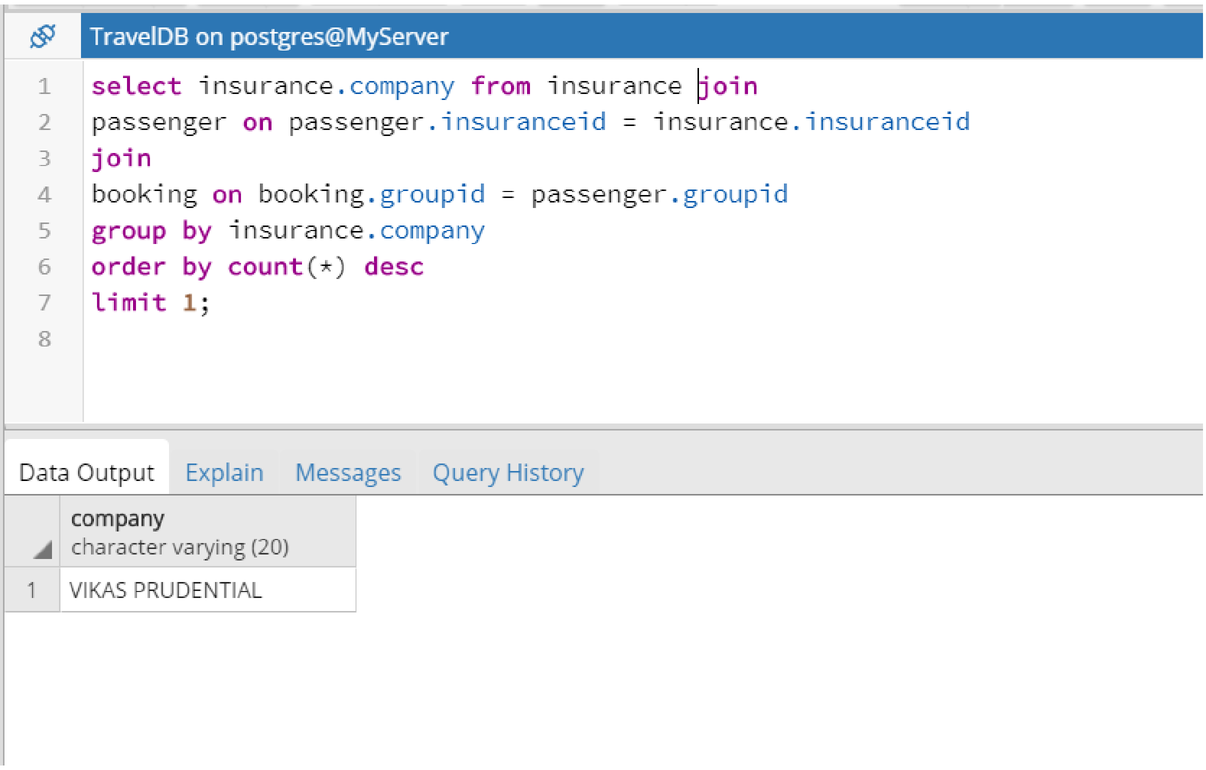
select insurance.company from insurance join passenger on passenger.insuranceid = insurance.insuranceid join booking on booking.groupid = passenger.groupid group by insurance.company order by count(*) desc limit 1;

RA:



$$R_1 \leftarrow \pi_{<\text{insurance.company}>} (\text{insurance} \bowtie_{<\text{passenger.insuranceid} = \text{insurance.insuranceid}>} \text{PassengeR} \bowtie_{<\text{passenger.groupid} = \text{booking.groupid}>} \text{Booking})$$

$$R_2 \leftarrow {}_{\text{insurance.company}}\mathcal{F}_{\text{count}(*)} (R_1)$$



```
select insurance.company from insurance join
passenger on passenger.insuranceid = insurance.insuranceid
join
booking on booking.groupid = passenger.groupid
group by insurance.company
order by count(*) desc
limit 1;
```

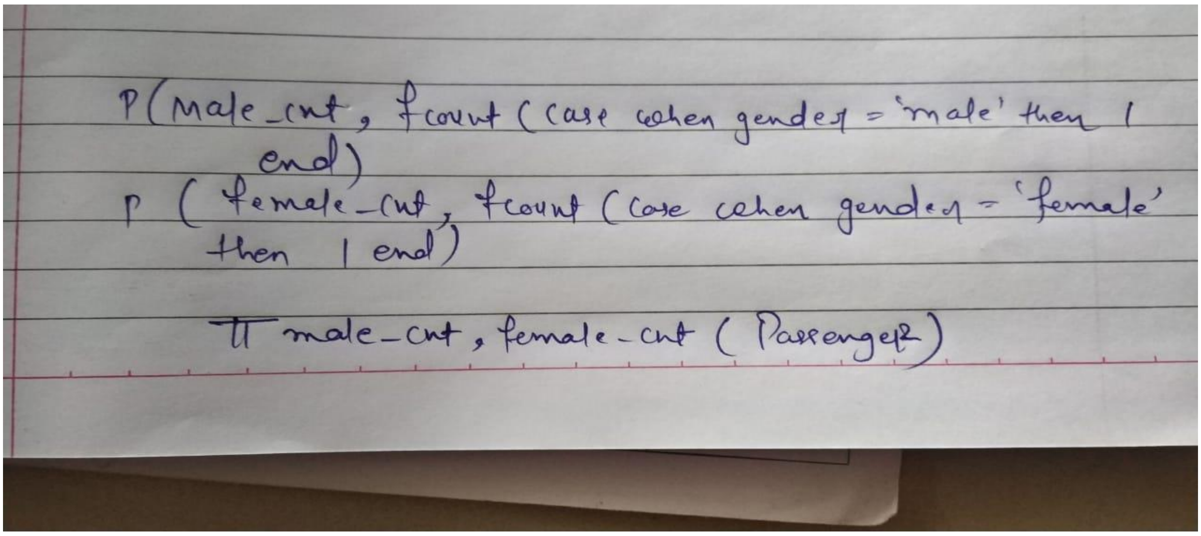
```
   company
   character varying (20)
1  VIKAS PRUDENTIAL
```

16.Find Total Male and Female Passengers.

SQL:

SELECT COUNT(CASE WHEN GENDER='MALE' THEN 1 END) AS MALE_CNT,COUNT(CASE WHEN GENDER='FEMALE' THEN 1 END) AS FEMALE_CNT FROM PASSENGER

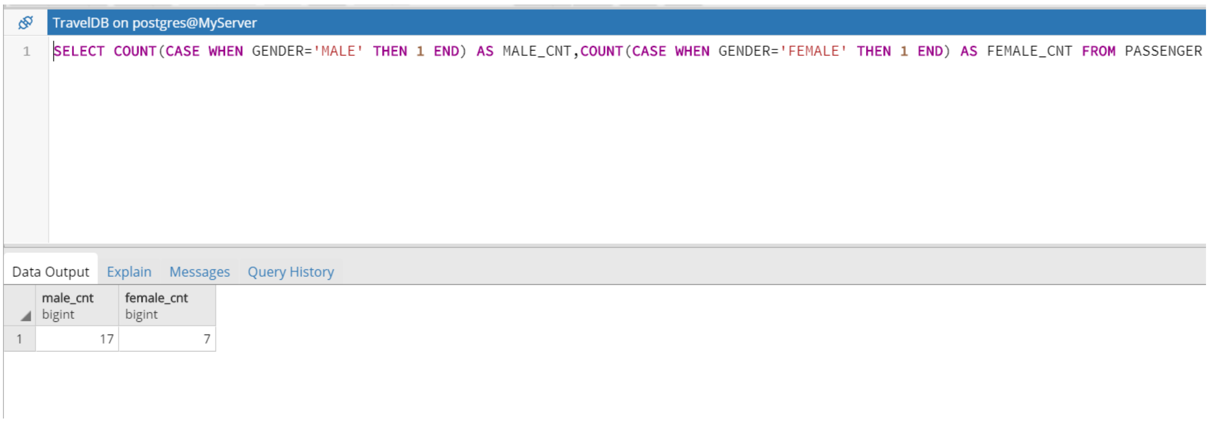
RA:



ρ(Male_cnt, ƒcount (case when gender = 'male' then 1 end))

ρ (female_cnt, ƒcount (case when gender = 'female' then 1 end))

π male_cnt, female_cnt (Passenger)



TravelDB on postgres@MyServer

```
SELECT COUNT(CASE WHEN GENDER='MALE' THEN 1 END) AS MALE_CNT,COUNT(CASE WHEN GENDER='FEMALE' THEN 1 END) AS FEMALE_CNT FROM PASSENGER
```

	male_cnt bigint	female_cnt bigint
1	17	7

17.Find out the offer that’s been used most.

SQL:

select * from offer join (select offercode from offer

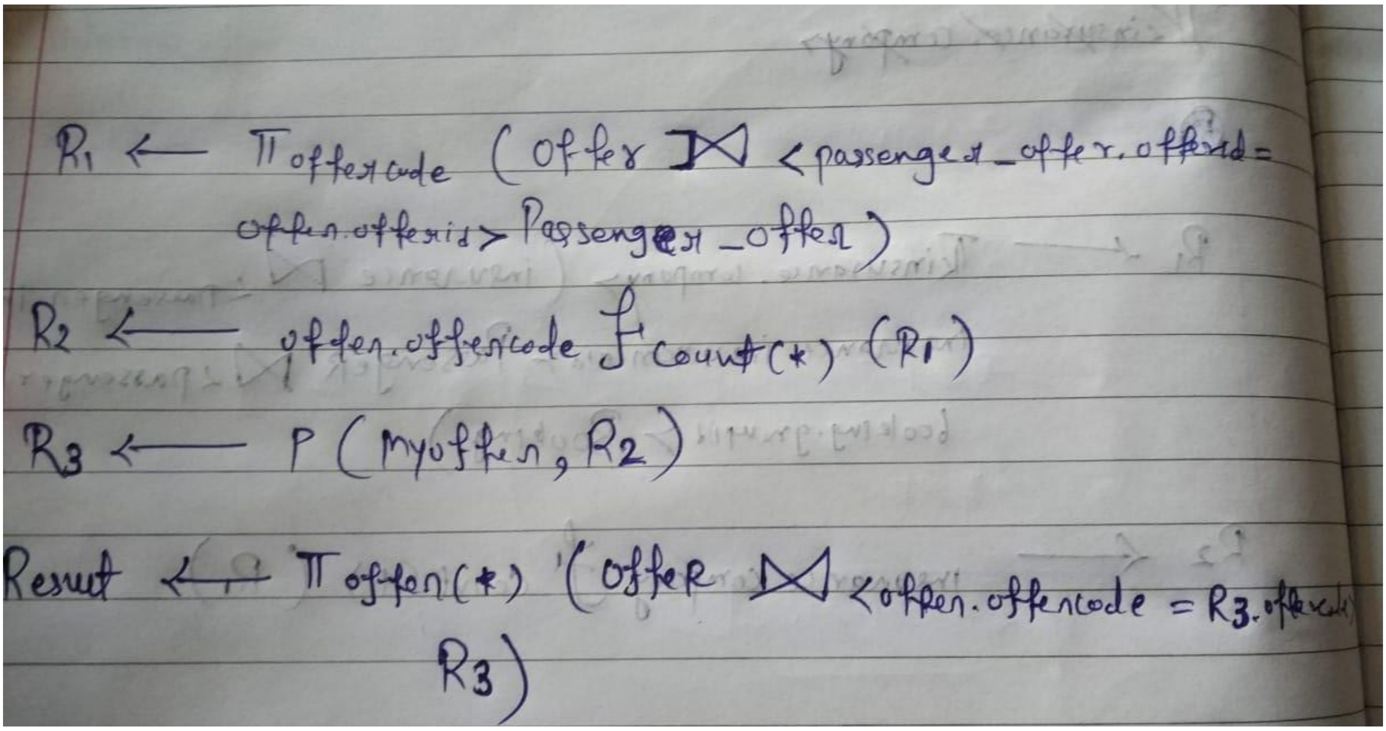
left join passenger_offer on passenger_offer.offerid=offer.offerid

group by offer.offercode

order by count(*) desc

limit 1) as myoffer on offer.offercode=myoffer.offercode

RA:

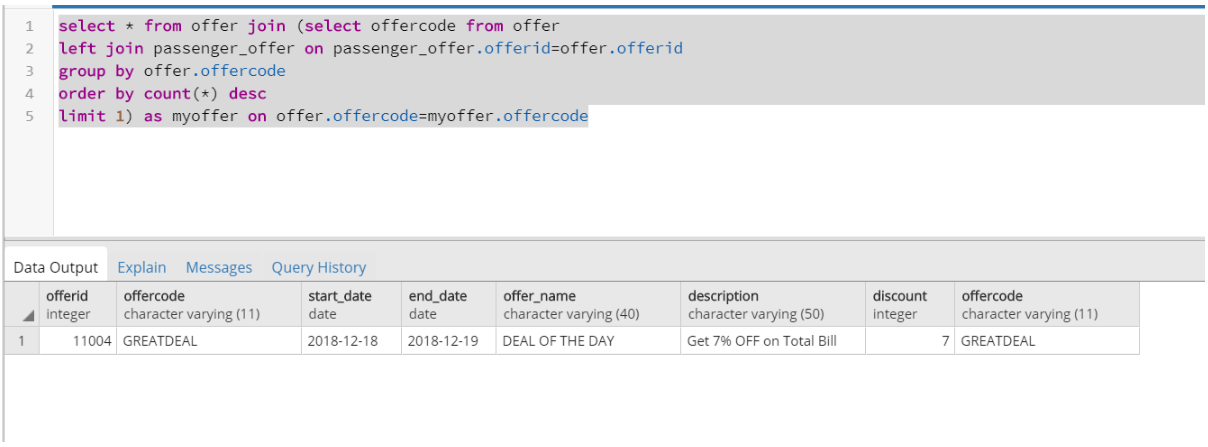


$R_1 \leftarrow \pi_{offercode}(Offer ⟕_{<passenger\_offer.offerid = offer.offerid>} Passenger\_offer)$

$R_2 \leftarrow {}_{offer.offercode}\mathcal{F}_{count(*)}(R_1)$

$R_3 \leftarrow \rho(myoffer, R_2)$

$Result \leftarrow \pi_{offer(*)}(Offer \bowtie_{<offer.offercode = R_3.offercode>} R_3)$



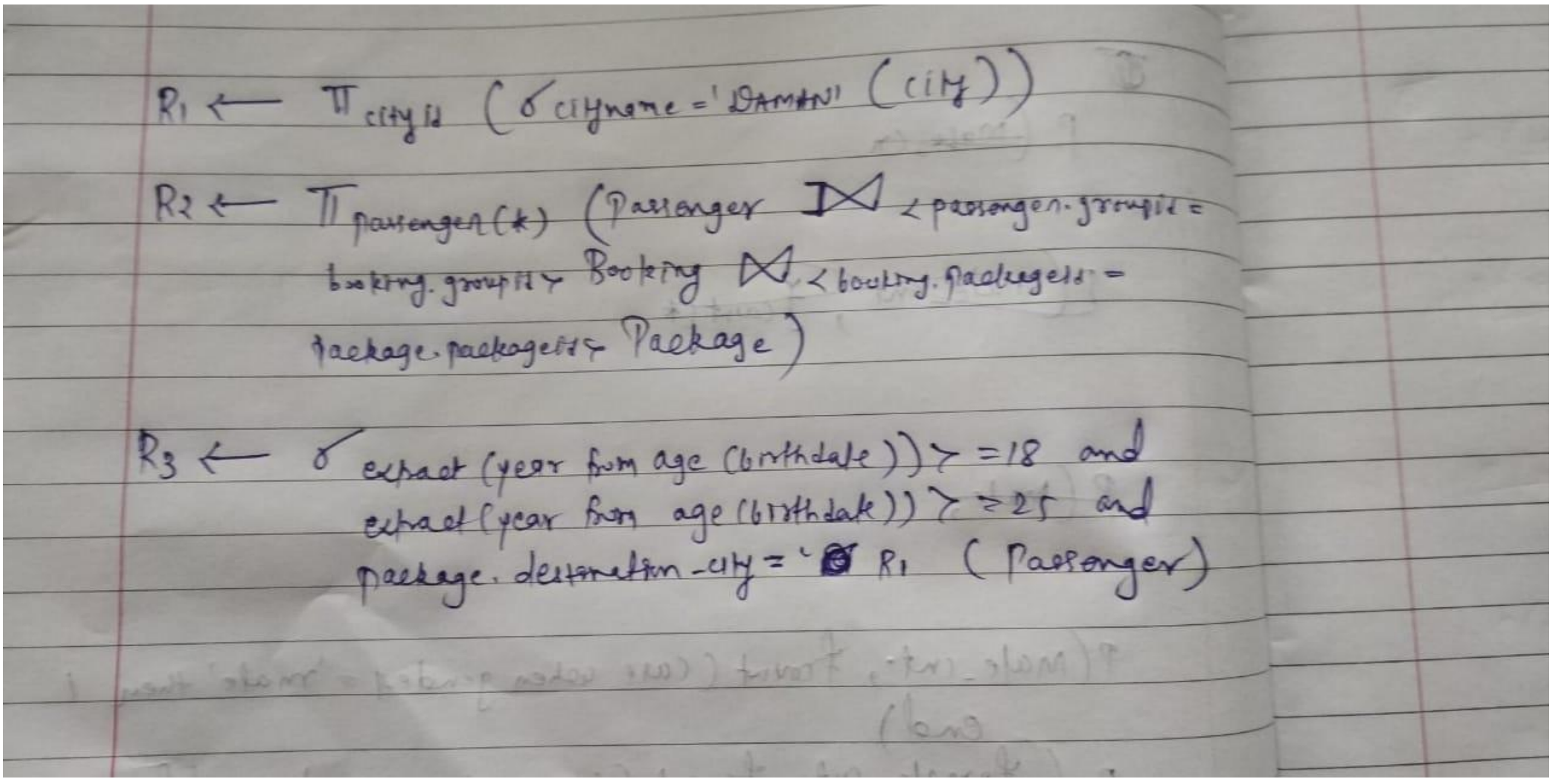
```
select * from offer join (select offercode from offer
left join passenger_offer on passenger_offer.offerid=offer.offerid
group by offer.offercode
order by count(*) desc
limit 1) as myoffer on offer.offercode=myoffer.offercode
```

	offerid integer	offercode character varying (11)	start_date date	end_date date	offer_name character varying (40)	description character varying (50)	discount integer	offercode character varying (11)
1	11004	GREATDEAL	2018-12-18	2018-12-19	DEAL OF THE DAY	Get 7% OFF on Total Bill	7	GREATDEAL

18. Retrieve the name of the passengers who are in age-group of 18-25 and gone to Daman.

SQL:
select * from passenger
left join booking on booking.groupid=passenger.groupid
join package on package.packageid=booking.packageid
 where extract(year from age(birthdate))>=18 and extract(year from age(birthdate))<=25 and package.destination_city=
 (select cityid from city where cityname='DAMAN');

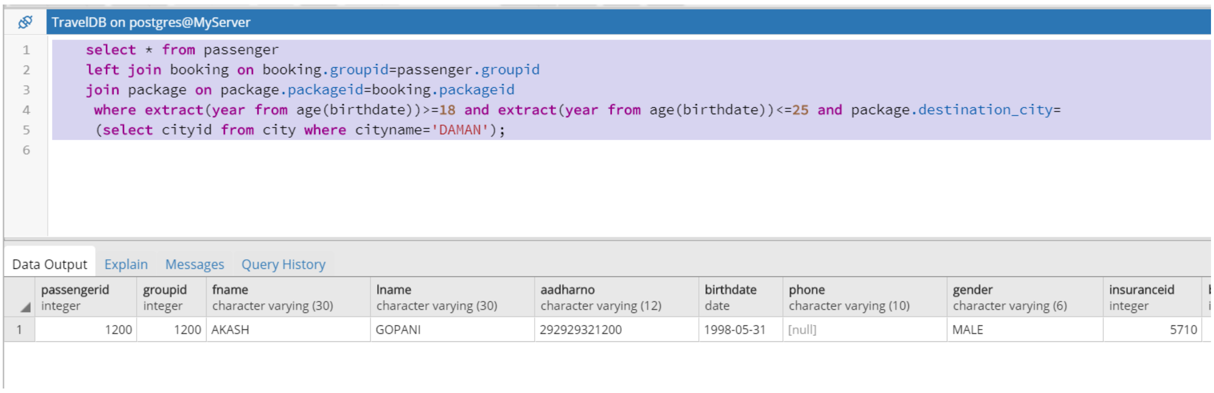
RA:



$R_1 \leftarrow \pi_{\text{city id}} (\sigma_{\text{cityname}='DAMAN'} (\text{city}))$

$R_2 \leftarrow \pi_{\text{passenger}(*)} (\text{Passenger} \bowtie_{<\text{passenger.groupid} = \text{booking.groupid}>} \text{Booking} \bowtie_{<\text{booking.packageid} = \text{package.packageid}>} \text{Package})$

$R_3 \leftarrow \sigma_{\text{extract (year from age (birthdate))} >= 18 \text{ and extract (year from age (birthdate))} >= 25 \text{ and package.destination-city} = ' R_1} (\text{Passenger})$



TravelDB on postgres@MyServer

```
 select * from passenger
 left join booking on booking.groupid=passenger.groupid
 join package on package.packageid=booking.packageid
  where extract(year from age(birthdate))>=18 and extract(year from age(birthdate))<=25 and package.destination_city=
  (select cityid from city where cityname='DAMAN');
```

	passengerid integer	groupid integer	fname character varying (30)	lname character varying (30)	aadharno character varying (12)	birthdate date	phone character varying (10)	gender character varying (6)	insuranceid integer
1	1200	1200	AKASH	GOPANI	292929321200	1998-05-31	[null]	MALE	5710

19.Retrive the names of the passengers who have used ‘BUMPER’ offercode.

SQL:

select fname,lname from passenger

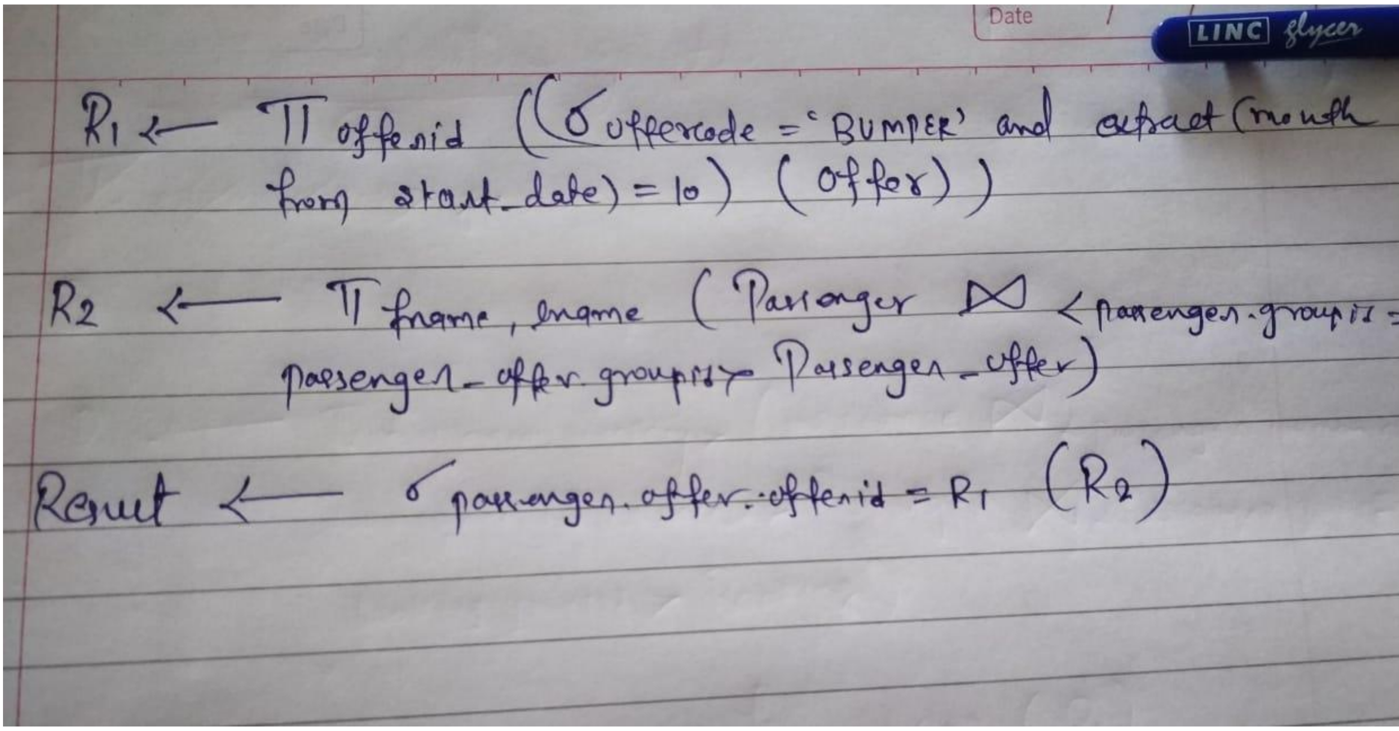
join

passenger_offer on passenger.groupid=passenger_offer.groupid

where

passenger_offer.offerid in (select offerid from offer where offercode='BUMPER' and extract(month from start_date)=10);

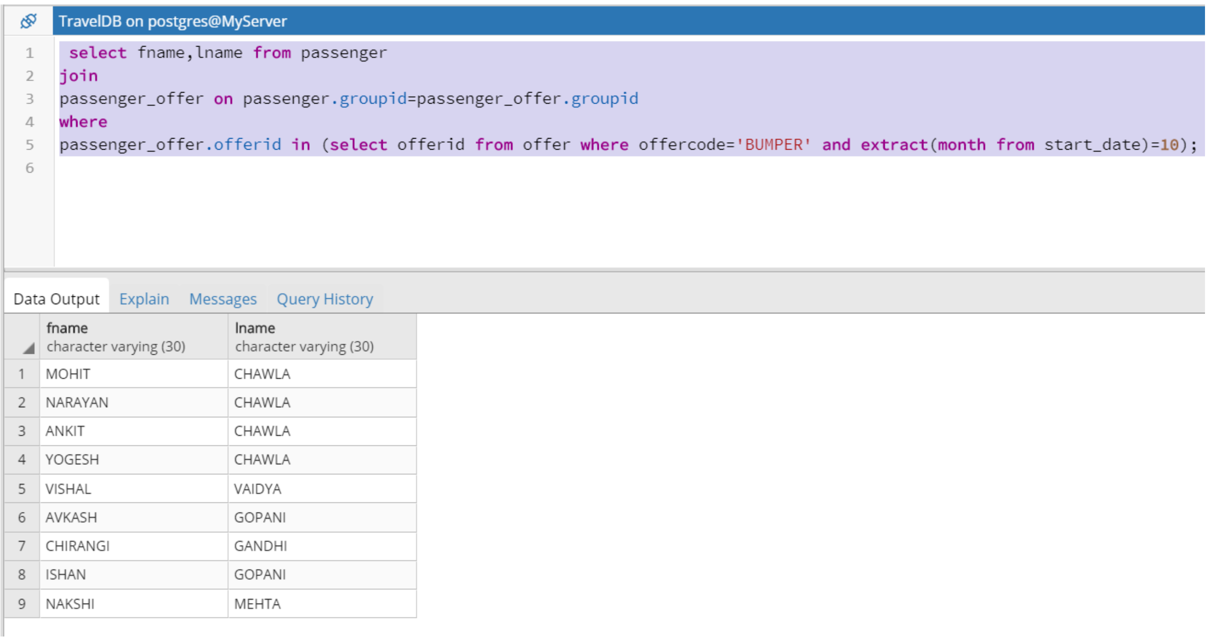
RA:



$R_1 \leftarrow \Pi_{offerid} ((\sigma_{offercode='BUMPER' \text{ and } extract(month\ from\ start\_date)=10}) (offer))$

$R_2 \leftarrow \Pi_{fname, lname} (Passenger \bowtie_{<passenger.groupid = passenger\_offer.groupid>} Passenger\_offer)$

$Result \leftarrow \sigma_{passenger\_offer.offerid = R_1} (R_2)$



TravelDB on postgres@MyServer

```
 select fname,lname from passenger
join
passenger_offer on passenger.groupid=passenger_offer.groupid
where
passenger_offer.offerid in (select offerid from offer where offercode='BUMPER' and extract(month from start_date)=10);
```

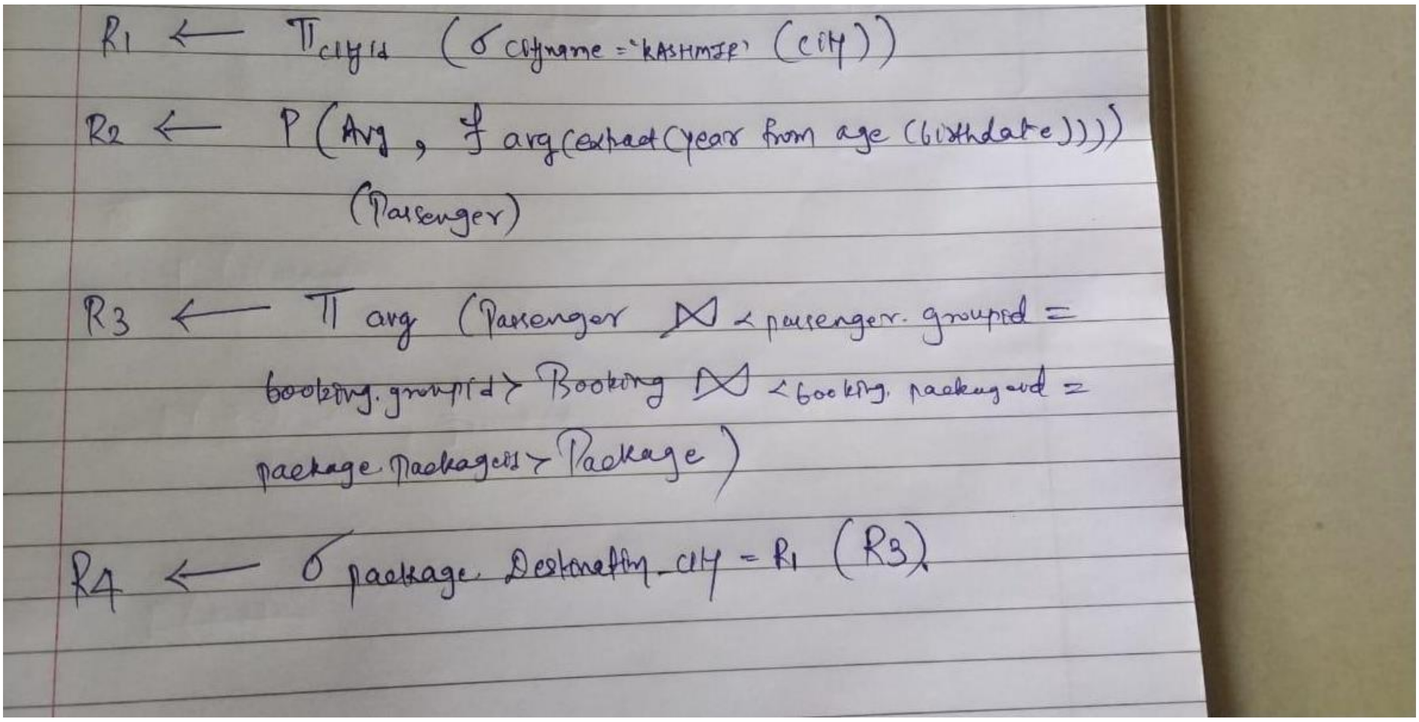
	fname character varying (30)	lname character varying (30)
1	MOHIT	CHAWLA
2	NARAYAN	CHAWLA
3	ANKIT	CHAWLA
4	YOGESH	CHAWLA
5	VISHAL	VAIDYA
6	AVKASH	GOPANI
7	CHIRANGI	GANDHI
8	ISHAN	GOPANI
9	NAKSHI	MEHTA

20. Given name of the city, find average age of passengers that have traveled there.

SQL:

select avg(extract(year from age(birthdate))) as Avg from passenger join booking on passenger.groupid=booking.groupid
join
package on package.packageid=booking.packageid
where package.destination_city=(select cityid from city where cityname='KASHMIR');

RA:

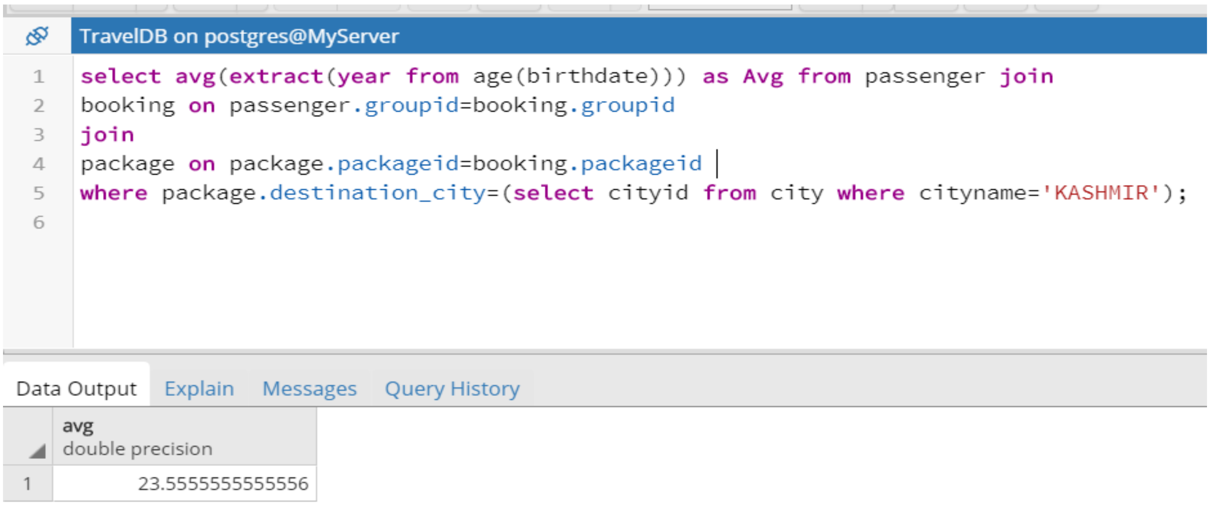


$R_1 \leftarrow \pi_{cityid}(\sigma_{cityname='KASHMIR'}(city))$

$R_2 \leftarrow \rho(Avg, \mathcal{F}_{avg(extract(year\ from\ age(birthdate))))}(Passenger))$

$R_3 \leftarrow \pi_{avg}(Passenger \bowtie_{<passenger.groupid = booking.groupid>} Booking \bowtie_{<booking.packageid = package.packageid>} Package)$

$R_4 \leftarrow \sigma_{package.Destination\_city = R_1}(R_3)$



```
select avg(extract(year from age(birthdate))) as Avg from passenger join
booking on passenger.groupid=booking.groupid
join
package on package.packageid=booking.packageid
where package.destination_city=(select cityid from city where cityname='KASHMIR');
```

	avg double precision
1	23.5555555555556

21.Find out the city which has been visited most times.

SQL:

select c.cityid,c.cityname,no_of_visits as visits from city c

join (select city.cityid,count(cityid) as no_of_visits from group_package_hotel gph

join package pack on gph.packageid=pack.packageid

join city on pack.destination_city=city.cityid

group by cityid) city_count on c.cityid=city_count.cityid join

(select max(no_of_visits) max_city from (select city.cityid,count(cityid) as no_of_visits from group_package_hotel

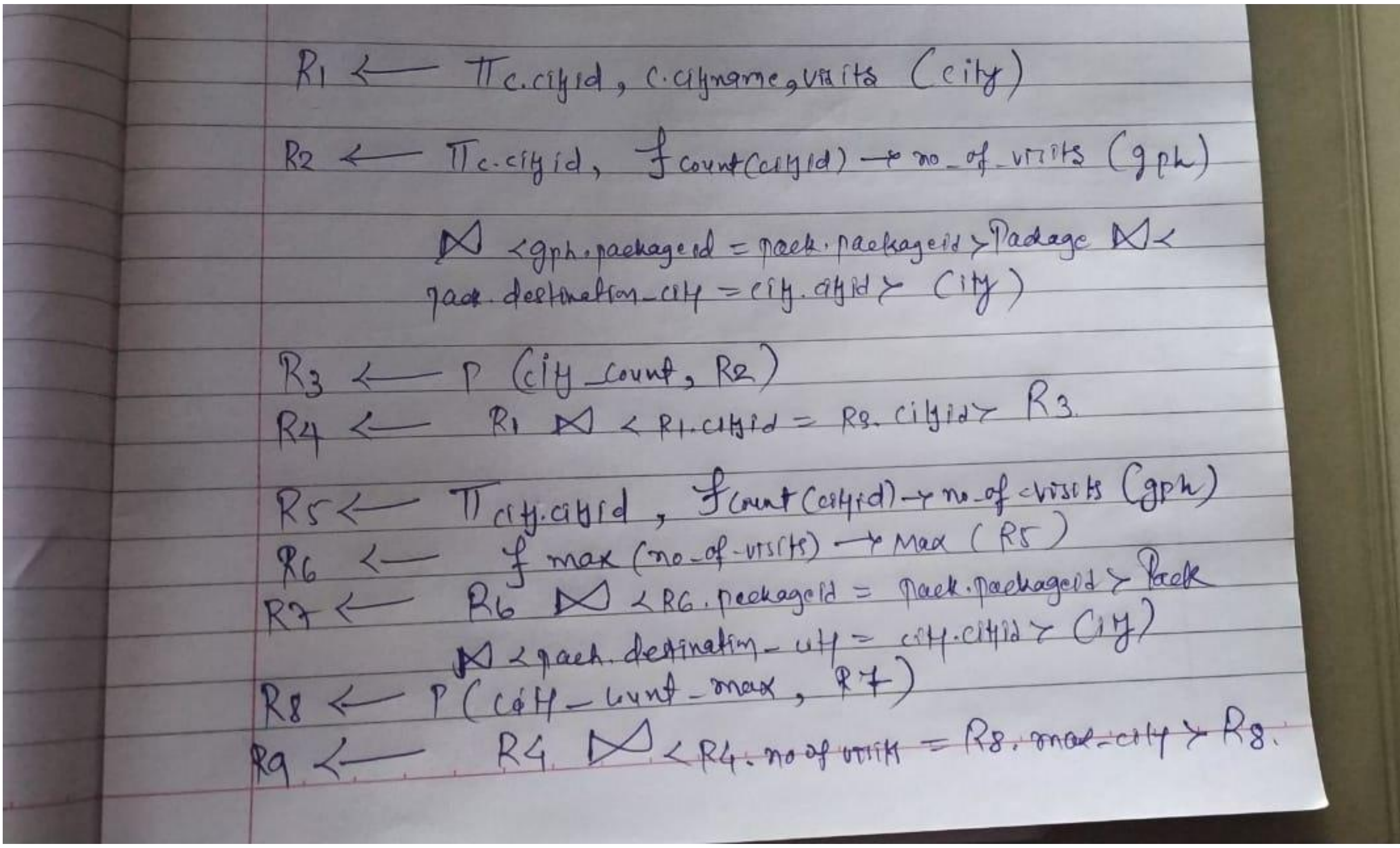
gph

```
        join package pack on gph.packageid=pack.packageid

        join city on pack.destination_city=city.cityid

        group by cityid) city_count_max ) m on m.max_city=city_count.no_of_visits
```

RA:



$R_1 \longleftarrow \pi_{c.cityid,\ c.cityname,\ visits}\ (city)$

$R_2 \longleftarrow \pi_{c.cityid,\ f_{count(cityid)} \rightarrow no\_of\_visits}\ (gph$

$\bowtie_{<gph.packageid\ =\ pack.packageid>} Package \bowtie_{<pack.destination\_city\ =\ city.cityid>}\ (city))$

$R_3 \longleftarrow \rho\ (city\_count,\ R_2)$

$R_4 \longleftarrow R_1 \bowtie_{<R_1.cityid\ =\ R_3.cityid>} R_3.$

$R_5 \longleftarrow \pi_{city.cityid}\ ,\ f_{count(cityid)} \rightarrow no\_of\_visits\ (gph)$

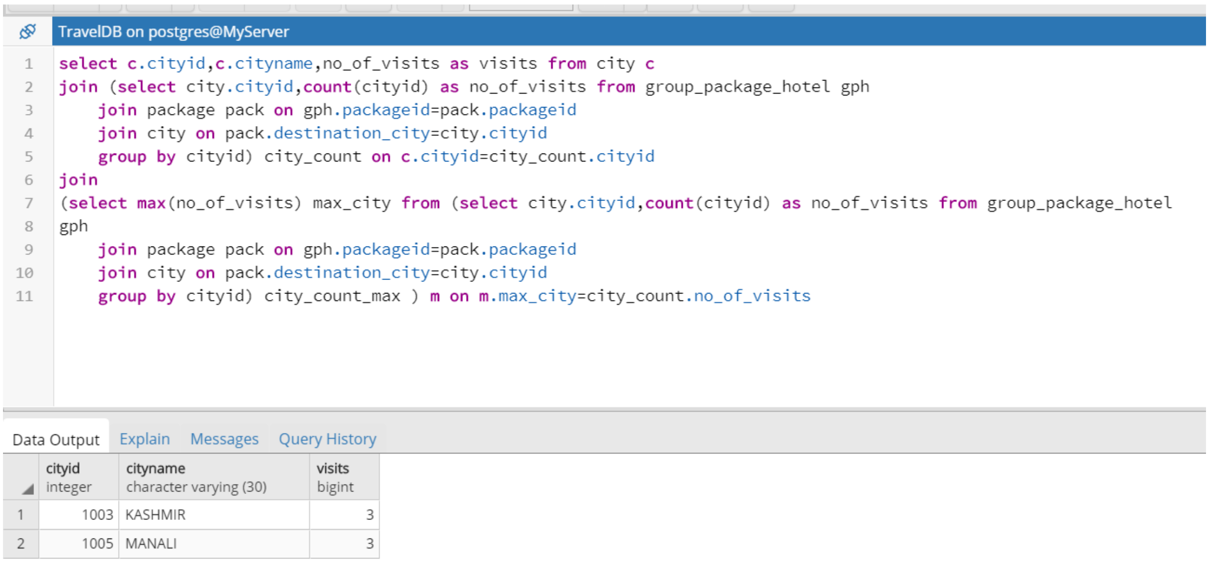
$R_6 \longleftarrow f\ max\ (no\_of\_visits) \rightarrow Max\ (R_5)$

$R_7 \longleftarrow R_6 \bowtie_{<R6.packageid\ =\ pack.packageid>} Pack$

$\bowtie_{<pack.destination\_city\ =\ city.cityid>}\ (City)$

$R_8 \longleftarrow \rho\ (city\_count\_max,\ R_7)$

$R_9 \longleftarrow R_4 \bowtie_{<R4.no\ of\ visits\ =\ R8.max\_city>} R_8.$



TravelDB on postgres@MyServer

```
select c.cityid,c.cityname,no_of_visits as visits from city c
join (select city.cityid,count(cityid) as no_of_visits from group_package_hotel gph
    join package pack on gph.packageid=pack.packageid
    join city on pack.destination_city=city.cityid
    group by cityid) city_count on c.cityid=city_count.cityid
join
(select max(no_of_visits) max_city from (select city.cityid,count(cityid) as no_of_visits from group_package_hotel
gph
    join package pack on gph.packageid=pack.packageid
    join city on pack.destination_city=city.cityid
    group by cityid) city_count_max ) m on m.max_city=city_count.no_of_visits
```

	cityid integer	cityname character varying (30)	visits bigint
1	1003	KASHMIR	3
2	1005	MANALI	3

22.Find out the total payment received in this month.

SQL:

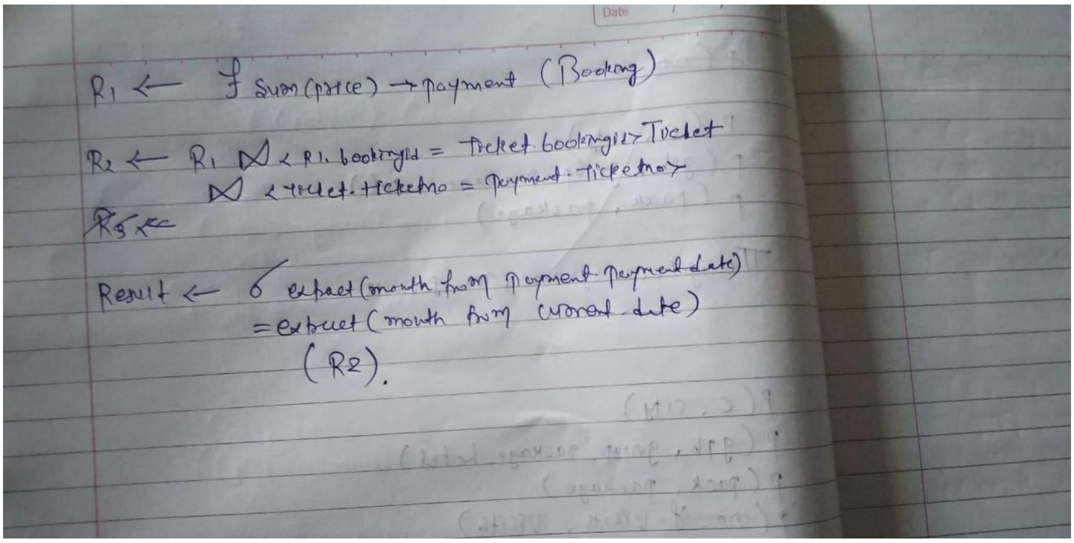
select sum(price) as Payment from booking

join ticket on ticket.bookingid = booking.bookingid

join payment on payment.ticketno = ticket.ticketno

where extract(month from payment.payment_date)=extract(month from current_date);

RA:



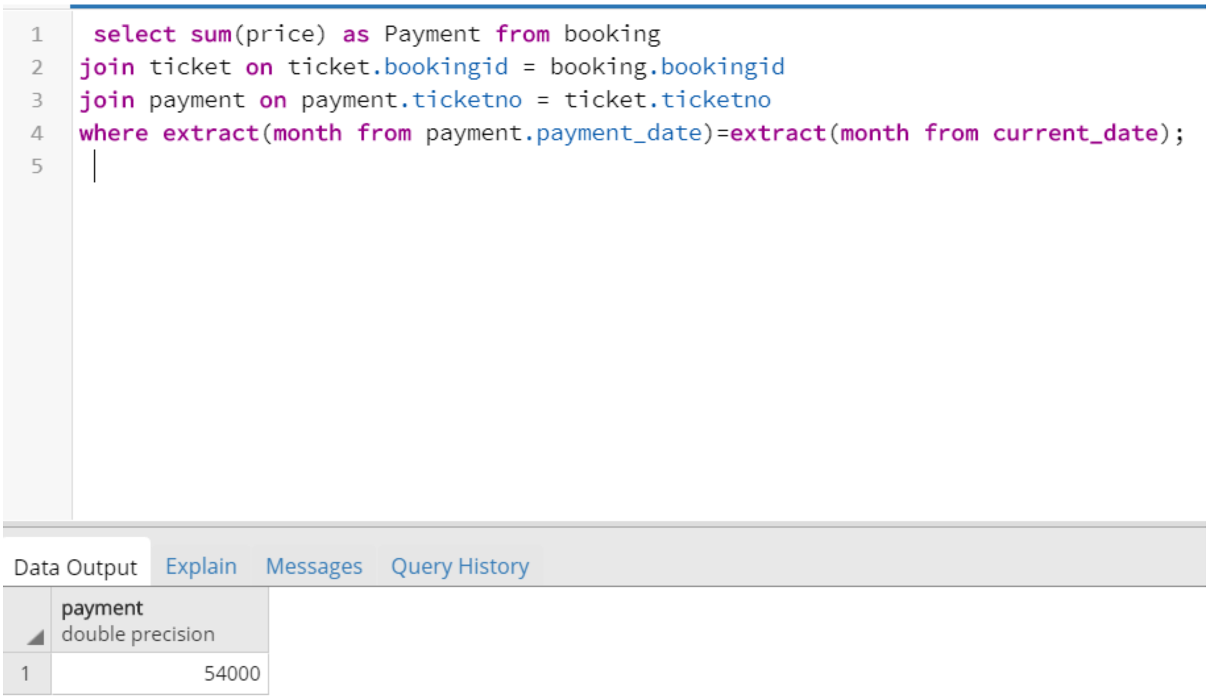
Date

$R_1 \leftarrow \mathcal{F}_{sum(price) \rightarrow payment}\ (Booking)$

$R_2 \leftarrow R_1 \bowtie_{<R1.bookingid = ticket.bookingid>} Ticket$
$\bowtie_{<ticket.ticketno = payment.ticketno>}$

~~$R_3 \leftarrow$~~

$Result \leftarrow \sigma_{extract(month\ from\ payment.payment\_date) = extract(month\ from\ current\_date)}$
$(R2).$



```sql
 select sum(price) as Payment from booking
join ticket on ticket.bookingid = booking.bookingid
join payment on payment.ticketno = ticket.ticketno
where extract(month from payment.payment_date)=extract(month from current_date);
```

	payment double precision
1	54000

23.Find out the passengers who have used all packages.(Division operator)

SQL:

select * from passenger join

(select distinct(groupid) from passenger where groupid in (select groupid from group_package_hotel

except

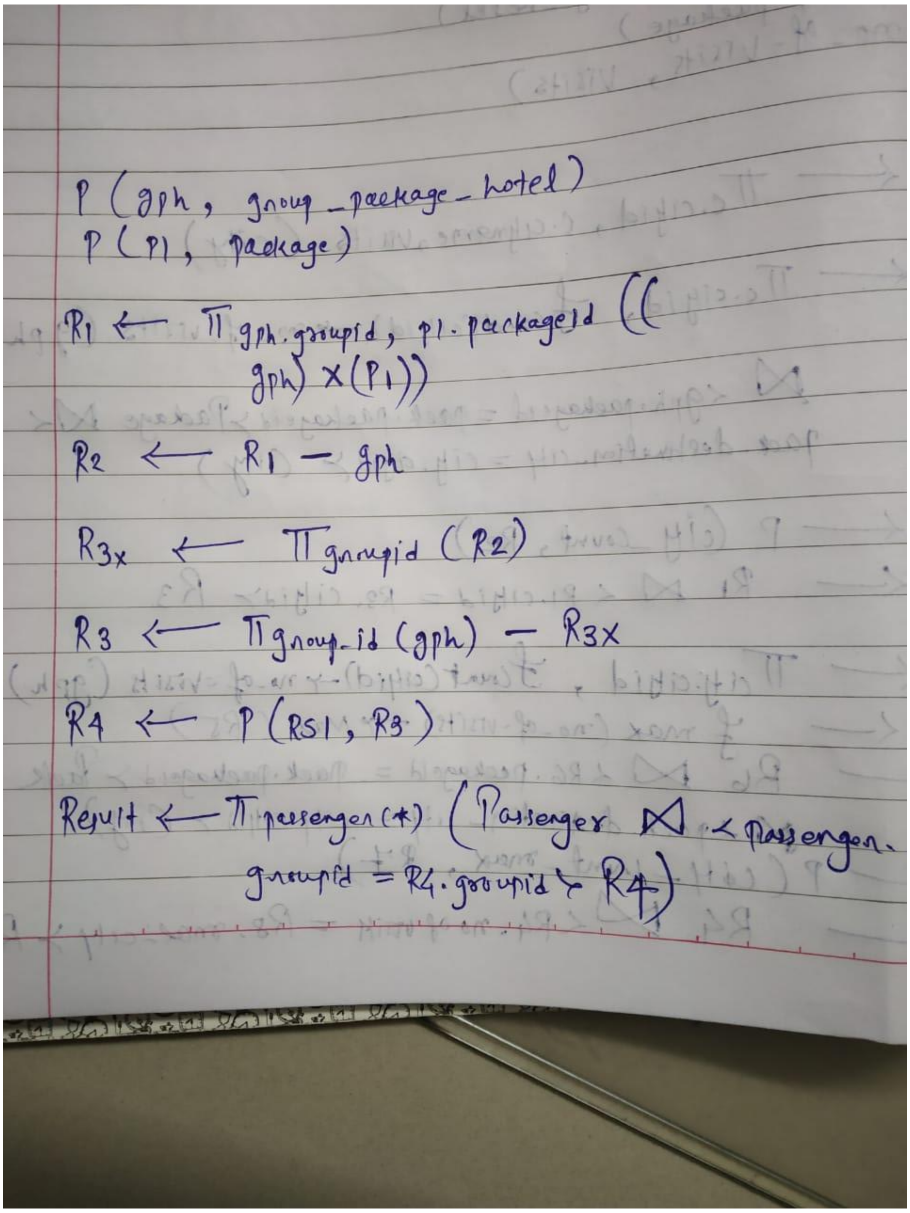
(select pg.groupid from

(select gph.groupid,p1.packageid from group_package_hotel as gph cross join package p1

except

select pg.groupid,pg.packageid from group_package_hotel as pg) as pg))) as r1 on passenger.groupid=r1.groupid

RA:



ρ (gph, group_package_hotel)
ρ (p1, package)

$R_1 \leftarrow \pi_{gph.groupid,\ p1.packageid}$ ((gph) × (P₁))

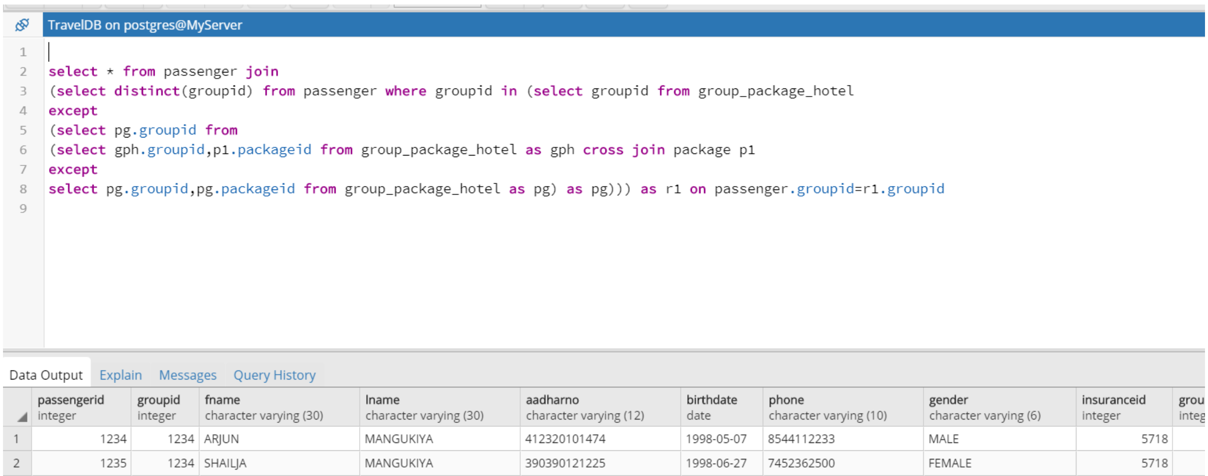
$R_2 \leftarrow R_1 - gph$

$R_{3x} \leftarrow \pi_{groupid} (R2)$

$R_3 \leftarrow \pi_{group\_id} (gph) - R_{3X}$

$R_4 \leftarrow \rho$ (RS1, R3)

Result $\leftarrow \pi_{passenger(*)}$ (Passenger $\bowtie_{<passenger.groupid = R4.groupid>}$ R4)



TravelDB on postgres@MyServer

```sql

select * from passenger join
(select distinct(groupid) from passenger where groupid in (select groupid from group_package_hotel
except
(select pg.groupid from
(select gph.groupid,p1.packageid from group_package_hotel as gph cross join package p1
except
select pg.groupid,pg.packageid from group_package_hotel as pg) as pg))) as r1 on passenger.groupid=r1.groupid

```

	passengerid integer	groupid integer	fname character varying (30)	lname character varying (30)	aadharno character varying (12)	birthdate date	phone character varying (10)	gender character varying (6)	insuranceid integer	grou integ
1	1234	1234	ARJUN	MANGUKIYA	412320101474	1998-05-07	8544112233	MALE	5718	
2	1235	1234	SHAILJA	MANGUKIYA	390390121225	1998-06-27	7452362500	FEMALE	5718	