

**Q1:) List hospital name and contact number having lowest total cost among all the private hospitals.**

```
SELECT h_name,h_phone,SUM(total_cost) FROM hos_info NATURAL JOIN payment_details
WHERE h_type='Private' GROUP BY h_name,h_phone,total_cost ORDER BY total_cost asc
LIMIT 1;
```






$$\Pi_{h\_name,h\_phone,total\_cost}(\sigma_{h\_type='Private'}(hos\_info \bowtie payment\_details))$$

Data Output	Explain	Messages	Notifications
	<b>h_name</b> character varying (25)	<b>h_phone</b> bigint	<b>sum</b> numeric
1	AIIMS	9876789878	34523.560

**Q2:) List user's ID, name, history of those who are admitted in the hospital after being tested positive and has medical history.**

```
SELECT user_details.u_id,u_name,u_history,pt_status FROM user_symptoms NATURAL JOIN
patient_details NATURAL JOIN user_details WHERE pt_status='Admitted' AND u_history <> '';
```


$$\Pi_{user\_details.u\_id,u\_name,u\_history,pt\_status}(\sigma_{pt\_status='Admitted' \text{ AND } u\_history \neq ''}(user\_symptoms \bowtie patient\_details \bowtie user\_details))$$

Data Output		Explain	Messages	Notifications
	<b>u_id</b> integer 	<b>u_name</b> character varying (25) 	<b>u_history</b> character varying (100) 	<b>pt_status</b> character varying (30) 
1	4	Kandarp	BP	Admitted
2	5	Bhumi	Cholesterol	Admitted

**Q3:) List user's ID, Name, status, medication,doctor name of those who are admitted after being tested positive.**

```
SELECT u_id,u_name,pt_status,pt_medication,h_name,doc_name FROM patient_details
NATURAL JOIN user_details NATURAL JOIN payment_details NATURAL JOIN hos_info
NATURAL JOIN doctor_details;
```

$\Pi_{u\_id, u\_name, pt\_status, pt\_medication, h\_name, doc\_name}$  (patient\_details  $\bowtie$  user\_details  $\bowtie$  payment\_details  $\bowtie$  hos\_info  $\bowtie$  doctor\_details)

Data Output		Explain	Messages	Notifications		
	u_id integer	u_name character varying (25)	pt_status character varying (30)	pt_medication character varying (100)	h_name character varying (25)	doc_name character varying (25)
1	3	Dhairya	Admitted	ivermectin,steroids	Civil	Dr. K.L.Kain
2	4	Kandarp	Admitted	favipiravir,steroids	AIIMS	Dr. Faizal Daruwala
3	5	Bhumi	Admitted	Remdesivir,favipiravir	Nishant Hospital	Dr.R.K.Mehta

**Q4) List all laboratory name, ID(103) and staff details(Receptionist, doctor and Technician) who are working in it.**

SELECT li.l\_id,l\_name,l\_technician,l\_doctor,l\_receptionist FROM lab\_info AS li INNER JOIN lab\_details AS ld ON li.l\_id=ld.l\_id WHERE li.l\_id='103';








$\Pi_{li.l\_id, l\_name, l\_technician, l\_doctor, l\_receptionist}(\sigma_{li.l\_id='103'}(lab\_info\ li\ \bowtie_{li.l\_id=ld.l\_id} lab\_details\ ld))$

Data Output		Explain	Messages	Notifications	
	<div><div><div><div></div><div>L_id</div><div>integer</div></div><div></div></div></div>	<div><div><div><div></div><div>L_name</div><div>character varying (25)</div></div><div></div></div></div>	<div><div><div><div></div><div>L_technician</div><div>character varying (50)</div></div><div></div></div></div>	<div><div><div><div></div><div>L_doctor</div><div>character varying (50)</div></div><div></div></div></div>	<div><div><div><div></div><div>L_receptionist</div><div>character varying (50)</div></div><div></div></div></div>
1	103	Neuberg	Abhishek Jha	Dr. Jainam Shah	Riya Patel

**Q5) List user ID, user name, lab ID, lab name and cost of those users whose payment status is pending.**

SELECT u\_id,u\_name,l\_id,l\_name,pay\_status,l\_cost FROM user\_details NATURAL JOIN l\_testing NATURAL JOIN lab\_info WHERE pay\_status='Pending';









$\Pi_{u\_id, u\_name, l\_id, l\_name, pay\_status, l\_cost}(\sigma_{pay\_status='Pending'}(user\_details\ \bowtie_{l\_testing\ \bowtie\ lab\_info}))$

Data Output		Explain	Messages	Notifications		
	<b>u_id</b> integer 	<b>u_name</b> character varying (25) 	<b>l_id</b> integer 	<b>l_name</b> character varying (25) 	<b>pay_status</b> character varying (20) 	<b>l_cost</b> numeric (7,3) 
1	5	Bhumi	101	Freberg	Pending	2000.000
2	4	Kandarp	105	Sarkari Lab	Pending	500.000

**Q6) List hospital ID, name, address, pincode, city, phone, email, type of those who are located in pincode='382330'**

```
SELECT h_id, h_name, h_address_line,h_city,h_pincode,h_phone,h_type FROM hos_info
WHERE h_pincode=382330;
```







$\Pi_{h\_id,h\_name,h\_address\_line,h\_city,h\_pincode,h\_phone,h\_type}(\sigma_{h\_pincode=382330}(hos\_info))$

Data Output		Explain	Messages	Notifications			
	h_id [PK] integer 	h_name character varying (25) 	h_address_line character varying (30) 	h_city character varying (30) 	h_pincode integer 	h_phone bigint 	h_type character varying (15) 
1	1001	AIIMS	116/A LalBahadur marg	Ahmedabad	382330	9876789878	Private

**Q7) Form a report by retrieving patient Id, medication, patient admit and discharge date, hospital, doctor, staff, and medical officer attending that patient with total cost.**

```
SELECT user_details.u_id, pt_medication, pt_admit_date, pt_discharge_date, h_name,
doc_name, n_name, med_off_name, total_cost FROM patient_details NATURAL JOIN
user_details INNER JOIN payment_details ON user_details.u_id=payment_details.u_id
NATURAL JOIN hos_info NATURAL JOIN staff_details NATURAL JOIN doctor_details;
```

$\Pi_{user\_details.u\_id,pt\_medication,pt\_admit\_date,pt\_discharge\_date,h\_name,doc\_name,n\_name,med\_off\_name,total\_cost} (patient\_details \bowtie user\_details \bowtie payment\_details \bowtie user\_details.u\_id=payment\_details.u\_id \bowtie hos\_info \bowtie staff\_details \bowtie doctor\_details)$

Data Output		Explain	Messages	Notifications												
 u_id	integer	pt_medication character varying (100)	 pt_admit_date	date	 pt_discharge_date	date	 h_name	character varying (25)	 doc_name	character varying (25)	 n_name	character varying (25)	med_off_name	character varying (25)	total_cost	numeric (10,3)
1	3	ivermectin,steroids	2021-08-01		2021-08-15		Civil		Dr. K.L.Kain		Pritha Thakkar		Dr. Prakash Javdekar		24567.670	
2	4	favipiravir,steroids	2021-03-15		2021-03-29		AIIMS		Dr. Faizal Daruwala		Archana Singh		Dr. John Simons		34523.560	
3	5	Remdesivir,favipiravir	2021-05-27		2021-06-10		Nishant Hospital		Dr.R.K.Mehta		Vidhi Shah		Dr. Dhaval Boriwala		40000.000	

**Q8) List doctor Id, name, degree and duty type of MS Physician doctors assigned for Covid Duty only.**

```
SELECT DISTINCT doc_id, doc_name, doc_degree, doc_duty_type FROM doctor_details
WHERE doc_degree='MS Physician' EXCEPT SELECT doc_id, doc_name, doc_degree,
doc_duty_type FROM doctor_details WHERE doc_duty_type='Counsulting';
```

$$(\Pi_{\text{doc\_id, doc\_name, doc\_degree, doc\_duty\_type}} (\sigma_{\text{doc\_degree}='MS \text{ Physician}'} (\text{doctor\_details}))) - (\Pi_{\text{doc\_id, doc\_name, doc\_degree, doc\_duty\_type}} (\sigma_{\text{doc\_duty\_type}='Counsulting'} (\text{doctor\_details})))$$

Data Output

Explain

Messages

Notifications

	<div>doc_id</div> <div>integer</div>	<div>doc_name</div> <div>character varying (25)</div>	<div>doc_degree</div> <div>character varying (50)</div>	<div>doc_duty_type</div> <div>character varying (20)</div>
1	304	Dr.Sameer Shah	MS Physician	Covid Duty
2	303	Dr.R.K.Mehta	MS Physician	Covid Duty

**Q9) List ID and name of patient who availed both xray and ctscan from Government hospitals.**

```
SELECT u_id, u_name FROM user_details NATURAL JOIN payment_details NATURAL JOIN
hos_info NATURAL JOIN imaging_center WHERE xray_avail='true' AND ctscan_avail='true'
INTERSECT SELECT u_id, u_name FROM user_details NATURAL JOIN payment_details
NATURAL JOIN hos_info WHERE h_type='Government';
```

$$(\Pi_{u\_id, u\_name} (\sigma_{xray\_avail='true' \text{ AND } ctscan\_avail='true'} (user\_details \bowtie payment\_details \bowtie hos\_info \bowtie imaging\_center)))) \cap (\Pi_{u\_id, u\_name} (\sigma_{h\_type='Government'} (user\_details \bowtie payment\_details \bowtie hos\_info)))$$

Data Output	Explain	Messages	Notifications
	<b>u_id</b> integer	<b>u_name</b> character varying (25)	
1	3	Dhairya	

**Q10) List hospital name, type of hospital, contact number of those having one the facility, that is, xray or ctscan.**

```
SELECT h_name, h_type, h_phone, xray_avail, ctscan_avail FROM hos_info NATURAL JOIN
imaging_center WHERE xray_avail='true' UNION SELECT h_name, h_type, h_phone,
xray_avail, ctscan_avail FROM hos_info NATURAL JOIN imaging_center WHERE
ctscan_avail='true';
```








$$(\Pi_{h\_name, h\_type, h\_phone, xray\_avail, ctscan\_avail} ((\sigma_{xray\_avail='true'} (hos\_info \bowtie imaging\_center)))) \cup (\Pi_{h\_name, h\_type, h\_phone, xray\_avail, ctscan\_avail} ((\sigma_{ctscan\_avail='true'} (hos\_info \bowtie imaging\_center))))$$

Data Output		Explain	Messages	Notifications	
	<div><div>h_name</div><div>character varying (25)</div></div>	<div><div>h_type</div><div>character varying (15)</div></div>	<div><div>h_phone</div><div>bigint</div></div>	<div><div>xray_avail</div><div>boolean</div></div>	<div><div>ctscan_avail</div><div>boolean</div></div>
1	Zydus	Private	78452309631	true	false
2	Nishant Hospital	Private	789669027	true	true
3	AIIMS	Private	9876789878	true	false
4	Civil	Government	8765432104	true	true

**Q11) List ID, name of patient who is suffering from any allergy and recovered from Covid. Also display patient medication, admit date and discharge date for the same.**

```
SELECT patient_details.u_id, u_name, u_allergy, pt_medication, pt_admit_date,
pt_discharge_date FROM user_details NATURAL JOIN user_symptoms INNER JOIN
patient_details ON user_details.u_id=patient_details.u_id WHERE u_allergy IS NOT NULL
AND u_allergy <> '';
```






$$(\Pi_{patient\_details.u\_id, u\_name, u\_allergy, pt\_medication, pt\_admit\_date, pt\_discharge\_date} ((\sigma_{u\_allergy \text{ IS NOT NULL AND } u\_allergy \neq ''} (user\_details \bowtie user\_symptoms \bowtie user\_details.u\_id=patient\_details.u\_id patient\_details))))$$

Data Output		Explain	Messages	Notifications		
	 u_id integer 	u_name character varying (25) 	u_allergy character varying (100) 	pt_medication character varying (100) 	pt_admit_date date 	pt_discharge_date date 
1	3	Dhairya	ibuprofen antibiotic	ivermectin,steroids	2021-08-01	2021-08-15

**Q12) List of the patients that are tested positive and have lung infection more than 25% in order to get admitted to the hospital.**

```
SELECT u_id, u_name, l_id, l_name, l_report, s_time, s_date, pt_lung_infec FROM
patient_details NATURAL JOIN user_details NATURAL JOIN l_testing NATURAL JOIN lab_info
WHERE l_report='Positive' AND pt_lung_infec>25;
```

$\Pi_{u\_id, u\_name, l\_id, l\_name, l\_report, s\_time, s\_date, pt\_lung\_infec} (\sigma_{l\_report='Positive' \text{ AND } pt\_lung\_infec > 25} (patient\_details \bowtie user\_details \bowtie l\_testing \bowtie lab\_info))$

Data Output		Explain	Messages	Notifications											
	u_id integer	u_name character varying (25)		l_id integer		l_name character varying (25)		l_report character varying (20)		s_time time without time zone		s_date date		pt_lung_infec numeric (4,2)	
1	3	Dhairya		104		Greencross		Positive		15:50:45		2021-07-25		55.00	
2	4	Kandarp		105		Sarkari Lab		Positive		14:38:45		2021-05-24		57.00	
3	5	Bhumi		101		Freberg		Positive		11:15:18		2021-05-22		50.00	

**Q13) List total count of patients tested positive out of total users having symptoms before testing for Covid.**

```
SELECT (SELECT COUNT(u_symptoms) FROM user_symptoms) AS user_symptom, (SELECT
COUNT(l_report) FROM l_testing WHERE l_report='Positive') AS tested_positive;
```

$\Pi((\rho_{user\_symptoms} (F_{COUNT(u\_symptoms)} (user\_symptoms)))) (\rho_{tested\_positive} F_{COUNT(l\_report)} (\sigma_{l\_report='Positive'} (l\_testing))))$

Data Output		Explain	Messages	Not
	<div><div>user_symptom</div><div>bigint</div></div>	<div><div></div><div></div></div>	<div><div>tested_positive</div><div>bigint</div></div>	<div><div></div><div></div></div>
1		5		4

**Q14) List the details of hospitals having Cost of an X-ray between 400 to 900 and a CT scan cost also between 4000 to 7000.**

```
SELECT h_id, h_name, h_phone, h_pincode, h_city FROM hos_info WHERE EXISTS (SELECT
xray_cost, ctscan_cost FROM imaging_center WHERE hos_info.h_id = imaging_center.h_id
AND xray_cost BETWEEN 400 AND 900 AND ctscan_cost BETWEEN 4000 AND 7000);
```

$\Pi_{h\_id, h\_name, h\_phone, h\_pincode, h\_city}(\sigma_{\text{EXISTS}(\Pi_{xray\_cost, ctscan\_cost}(\sigma_{\text{hos\_info.h\_id}=\text{imaging\_center.h\_id AND xray\_cost BETWEEN 400 AND 900 AND ctscan\_cost BETWEEN 4000 AND 7000}(\text{imaging\_center}))))$

Data Output

Explain











Messages

Notifications

	h_id [PK] integer	h_name character varying (25)	h_phone bigint	h_pincode integer	h_city character varying (30)
1	1002	Civil	8765432104	376514	Udaipur

**Q15) List laboratory details of those which are in Ahmedabad city showing values in ascending order in terms of cost.**

SELECT l\_id, l\_cost, l\_name, l\_address\_line, l\_landmark, l\_city, l\_pincode, l\_phone, l\_email  
FROM lab\_info GROUP BY l\_cost, l\_id HAVING l\_city='Ahmedabad' ORDER BY l\_cost ASC;

Data Output		Explain	Messages	Notifications					
	 <b>L_id</b> [PK] integer	 <b>L_cost</b> numeric (7,3)	 <b>L_name</b> character varying (25)	 <b>L_address_line</b> character varying (30)	 <b>L_landmark</b> character varying (30)	 <b>L_city</b> character varying (30)	 <b>L_pincode</b> integer	 <b>L_phone</b> bigint	 <b>L_email</b> character varying (50)
1	105	500.000	Sarkari Lab	Nobal nagar society	Naroda	Ahmedabad	382330	9876576543	sarkarilab@gmail.com
2	102	1500.000	Supratech	Bhavesbhai ni vadi	Navrangpura	Ahmedabad	382350	9876543210	supratech@gmail.com
3	101	2000.000	Freberg	Bhagabhai ni vadi	Civil	Ahmedabad	382310	9876545678	freberg@gmail.com
4	104	2000.000	Greencross	Kavi nanalal marg	Ravjinagar	Ahmedabad	382360	9876543213	greencross@gmail.com

$\Pi_{l\_cost, l\_id}(\sigma_{\text{HAVING l\_city} = \text{"Ahmedabad"}}(\text{ORDER BY l\_cost, l\_id, lab\_info}(\text{lab\_info})))$