DBMS
ASSIGNMENT: 5

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1. Illustrate logical ANY, ALL and LIKE operator- the queries should be relevant to your respective databases 3 queries for each operator. One query explaining the difference between ANY and ALL.

Answer:

a. ANY

Query:

```
SELECT pat_name, pat_gender
FROM t1_patients WHERE
pat_id > ANY (SELECT doc_id FROM t1_doctor
WHERE doc_id > 5);

SELECT doc_name, doc_designation, doc_gender
FROM t1_doctor WHERE
doc_id > ANY (SELECT pat_id FROM t1_patients
WHERE pat_gender = 'Female');

SELECT patient_name, doctor_name, amount
FROM t1_bill WHERE
pat_id > ANY (SELECT doc_id FROM t1_doctor
WHERE doc_id > 5);
```

Output:

150 %

Results | Messages

	pat_name	pat_gender
2	Heni	Female
3	Sreya	Female
4	Hardik	Male
5	Mansi	Female
6	Bhavin	Male
7	Ramesh	Male
8	Suresh	Male
9	Swati	Female

	doc_name	doc_designation	doc_gender
1	Sumit	Cardiologist	Male
2	Rashmi	Gynaecologist	Female
3	Ram	Audiologist	Male
4	Sunita	Gynaecologist	Female
5	Sayam	Lab Technician	Male
6	Deedhiti	ENT Specialist	Female
7	Smit	Paediatrician	Male
8	Ayush	Veterinarian	Male

	patient_name	doctor_name	amount
1	Shivam Patel	Sumit	3000
2	Rajendra Sukla	Rashmi	3000
3	Shivam Patel	Jayesh	3000
4	Shyam Patil	Rashmi	800
5	Rajkumar Yad...	Sumit	1200
6	Rajendra Sukla	Rashmi	3000
7	Soham Naik	Jayesh	3100

b. ALL

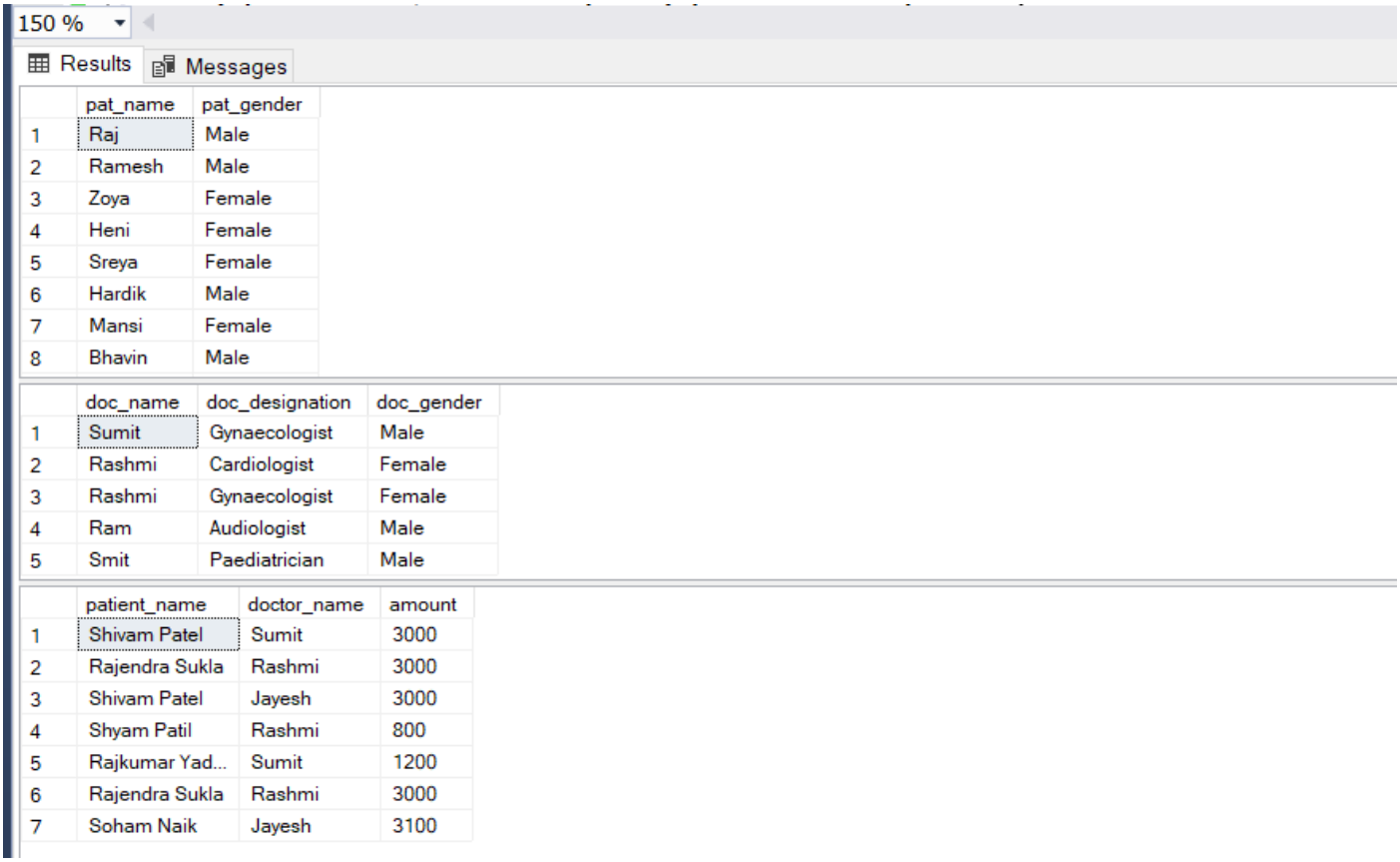
Query:

```
SELECT pat_name, pat_gender
FROM t1_patients WHERE
pat_id > ALL (SELECT doc_id FROM t1_doctor
WHERE doc_id < 5);

SELECT doc_name, doc_designation, doc_gender
FROM t1_doctor WHERE
doc_id <> ALL (SELECT pat_id FROM t1_patients
WHERE pat_gender = 'Female');

SELECT patient_name, doctor_name, amount
FROM t1_bill WHERE
pat_id > ALL (SELECT doc_id FROM t1_doctor
WHERE doc_id = 7);
```

Output:



150 %

Results | Messages

	pat_name	pat_gender
1	Raj	Male
2	Ramesh	Male
3	Zoya	Female
4	Heni	Female
5	Sreya	Female
6	Hardik	Male
7	Mansi	Female
8	Bhavin	Male

	doc_name	doc_designation	doc_gender
1	Sumit	Gynaecologist	Male
2	Rashmi	Cardiologist	Female
3	Rashmi	Gynaecologist	Female
4	Ram	Audiologist	Male
5	Smit	Paediatrician	Male

	patient_name	doctor_name	amount
1	Shivam Patel	Sumit	3000
2	Rajendra Sukla	Rashmi	3000
3	Shivam Patel	Jayesh	3000
4	Shyam Patil	Rashmi	800
5	Rajkumar Yad...	Sumit	1200
6	Rajendra Sukla	Rashmi	3000
7	Soham Naik	Jayesh	3100

c. LIKE

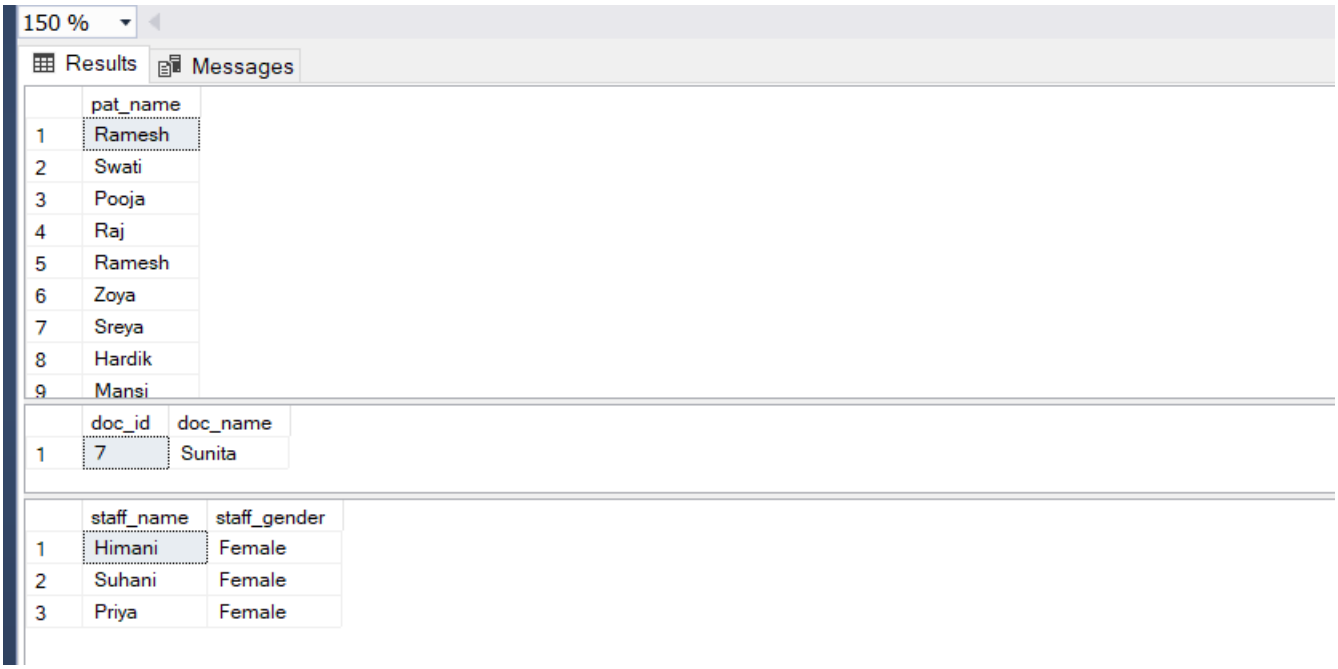
Query:

```
select pat_name from t1_patients
where pat_name like '%a%';

select doc_id, doc_name from t1_doctor
where doc_name like '%a';
```

```
select staff_name, staff_gender from t1_staff
where staff_gender like 'Fe%';
```

OUTPUT:



150 %

Results | Messages

	pat_name
1	Ramesh
2	Swati
3	Pooja
4	Raj
5	Ramesh
6	Zoya
7	Sreya
8	Hardik
9	Mansi

	doc_id	doc_name
1	7	Sunita

	staff_name	staff_gender
1	Himani	Female
2	Suhani	Female
3	Priya	Female

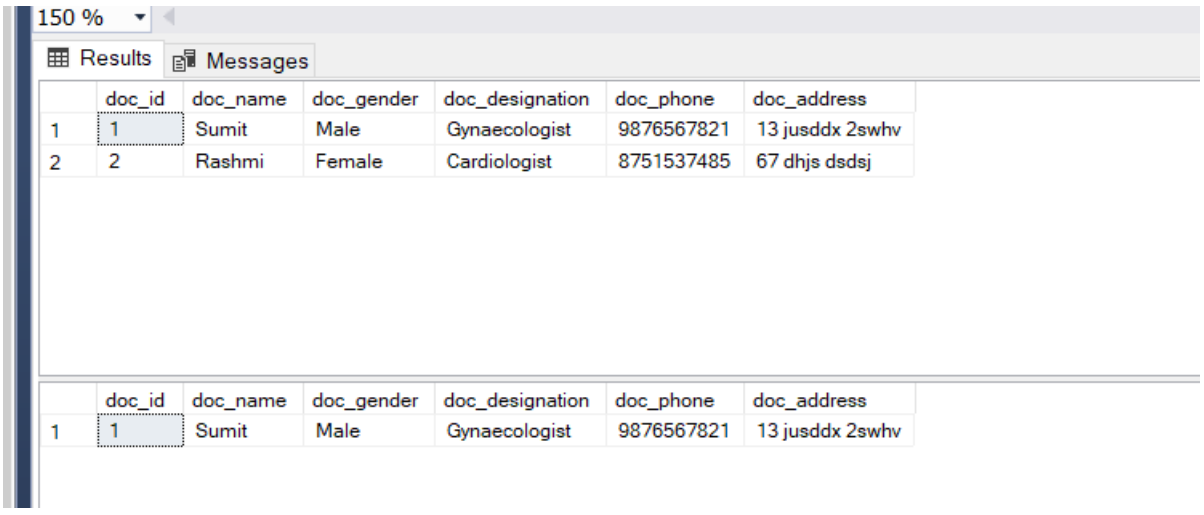
d. Difference between AND and ALL

Query:

```
SELECT * FROM t1_doctor
WHERE doc_id < ANY (SELECT doc_id
FRom t1_doctor
WHERE doc_id < 4 and doc_id >1);

SELECT * FROM t1_doctor
WHERE doc_id < ALL (SELECT doc_id
FROM t1_doctor
WHERE doc_id < 4 and doc_id > 1);
```

Output:



150 %

Results | Messages

	doc_id	doc_name	doc_gender	doc_designation	doc_phone	doc_address
1	1	Sumit	Male	Gynaecologist	9876567821	13 jusddx 2swhv
2	2	Rashmi	Female	Cardiologist	8751537485	67 dhjs dsdsj

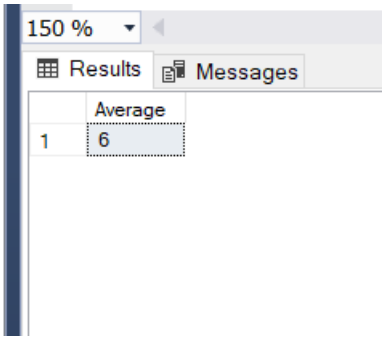
	doc_id	doc_name	doc_gender	doc_designation	doc_phone	doc_address
1	1	Sumit	Male	Gynaecologist	9876567821	13 jusddx 2swhv

2. One query for each Aggregate function.
   a. **Average**

      Query:

```
SELECT AVG(doc_id) AS 'Average'
FROM t1_doctor;
```

      Output:

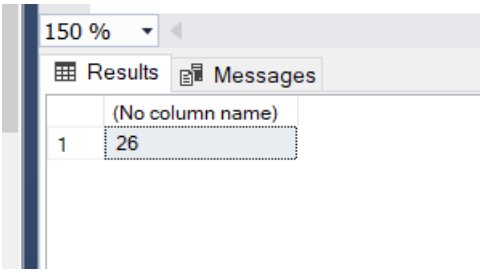


   b. **Count**

      Query:

```
SELECT COUNT(*)
FROM t1_patients
WHERE pat_id>10;
```

      Output:

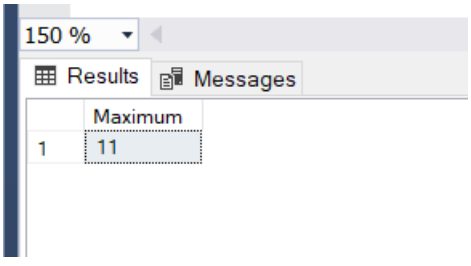


   c. **Max**

      Query:

```
SELECT MAX(doc_id)
AS 'Maximum'
From t1_doctor;
```

      Output:

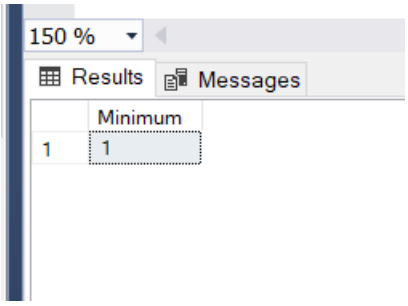


d. Min

Query:

```
SELECT MIN(staff_id)
as 'Minimum'
From t1_staff;
```

Output:

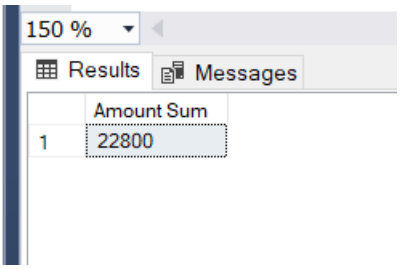


e. Sum

Query:

```
SELECT SUM(amount)
AS 'Amount Sum'
From t1_bill;
```

Output:



3. Illustrate the usage of order by, group by and having clause (2 queries for each case)

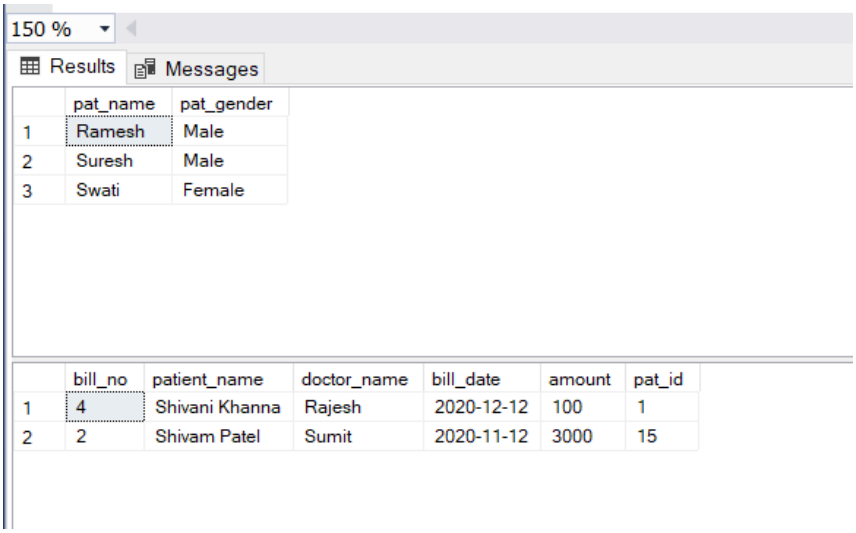
a. Order by

Query:

```
SELECT pat_name, pat_gender FROM t1_patients
WHERE pat_id < 4 ORDER BY pat_name ASC

SELECT * FROM t1_bill
WHERE bill_no < 5 ORDER BY patient_name DESC
```

Output:



	pat_name	pat_gender
1	Ramesh	Male
2	Suresh	Male
3	Swati	Female

	bill_no	patient_name	doctor_name	bill_date	amount	pat_id
1	4	Shivani Khanna	Rajesh	2020-12-12	100	1
2	2	Shivam Patel	Sumit	2020-11-12	3000	15

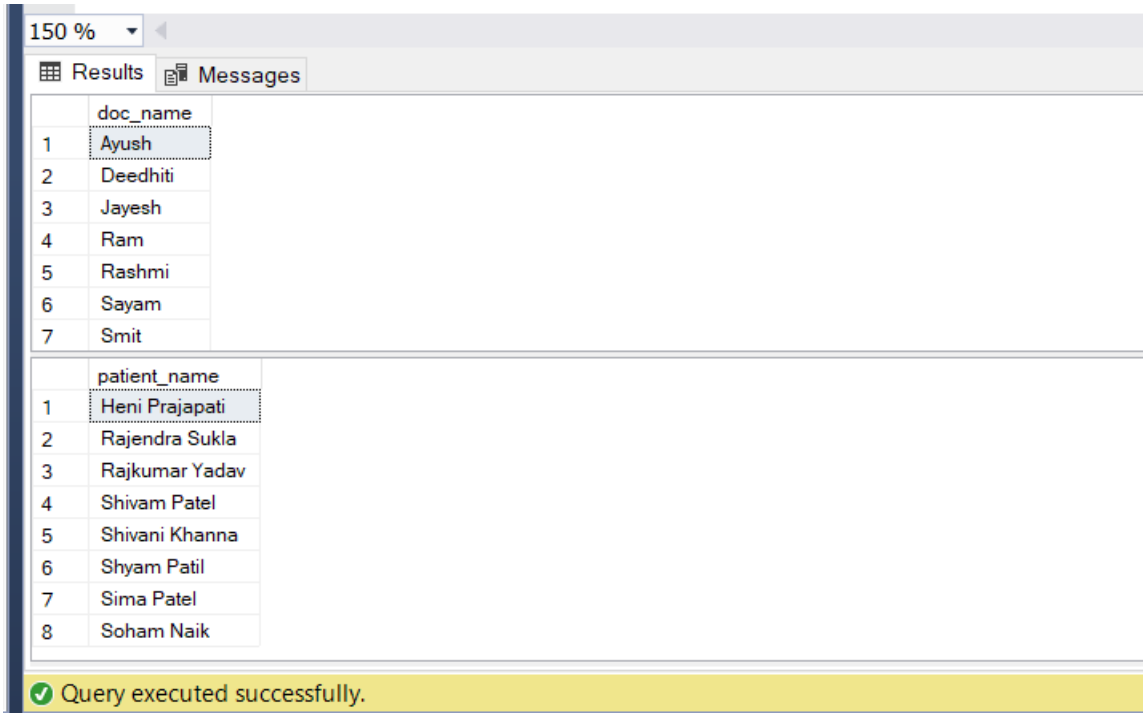
b. GROUP BY

Query:

```
SELECT doc_name
FROM t1_doctor
GROUP BY doc_name;

SELECT patient_name
FROM t1_bill
GROUP BY patient_name;
```

Output:



	doc_name
1	Ayush
2	Deedhiti
3	Jayesh
4	Ram
5	Rashmi
6	Sayam
7	Smit

	patient_name
1	Heni Prajapati
2	Rajendra Sukla
3	Rajkumar Yadav
4	Shivam Patel
5	Shivani Khanna
6	Shyam Patil
7	Sima Patel
8	Soham Naik

Query executed successfully.

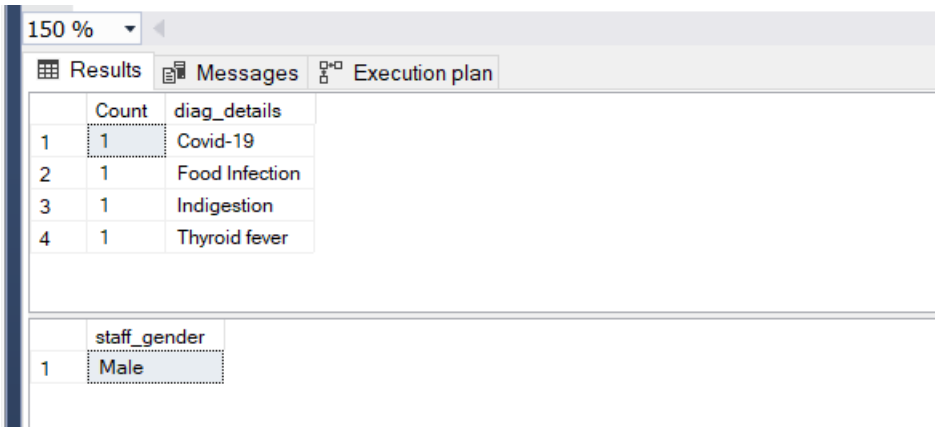
c. **HAVING**

Query:

```
SELECT COUNT(diag_no) AS 'Count', diag_details
FROM t1_patient_diagnosis
GROUP BY diag_details
HAVING COUNT(pat_id) > 0;

SELECT staff_gender
FROM t1_staff
GROUP BY staff_gender
HAVING staff_gender = 'Male';
```

Output:



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Results | Messages | Execution plan

	Count	diag_details
1	1	Covid-19
2	1	Food Infection
3	1	Indigestion
4	1	Thyroid fever

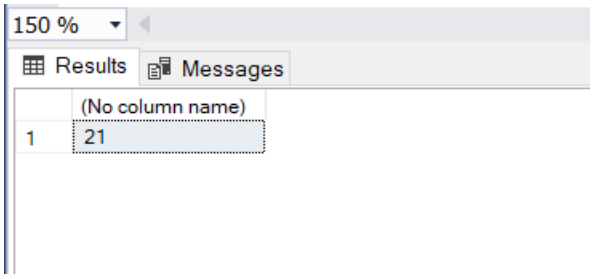
	staff_gender
1	Male

4. Use Aggregate function with group by and having

a. **Query:**

```
SELECT AVG(pat_id) FROM t1_patients
GROUP BY pat_gender
HAVING pat_gender='Female';
```

Output:



150 %

Results | Messages

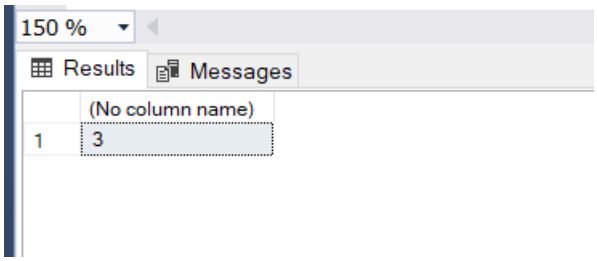
	(No column name)
1	21

b. **Query:**

```
SELECT count(doc_id) FROM t1_doctor
```

```
GROUP BY doc_designation
HAVING doc_designation='Gynaecologist';
```

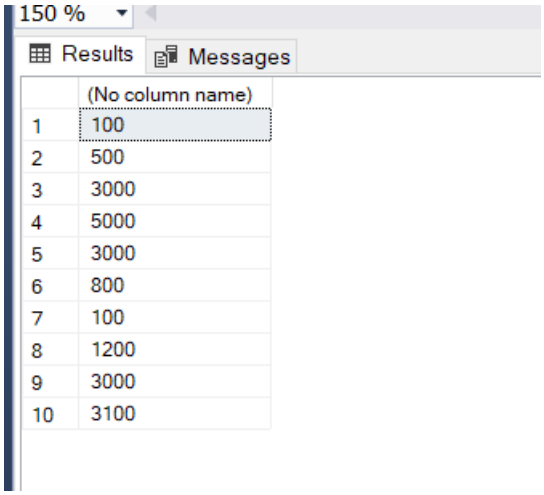
Output:



c. **Query:**

```
SELECT max(amount) FROM t1_bill
GROUP BY bill_no
HAVING bill_no > 3;
```

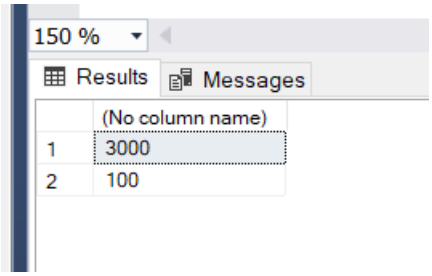
Output:



d. **Query:**

```
SELECT min(amount) FROM t1_bill
GROUP BY bill_no
HAVING bill_no < 10;
```

Output:

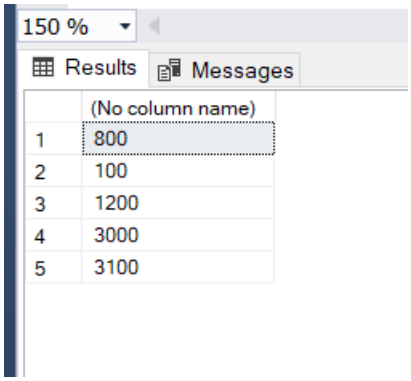


e. **Query:**

```
SELECT sum(amount) FROM t1_bill
GROUP BY bill_no
```

```
HAVING bill_no > 15;
```

Output:



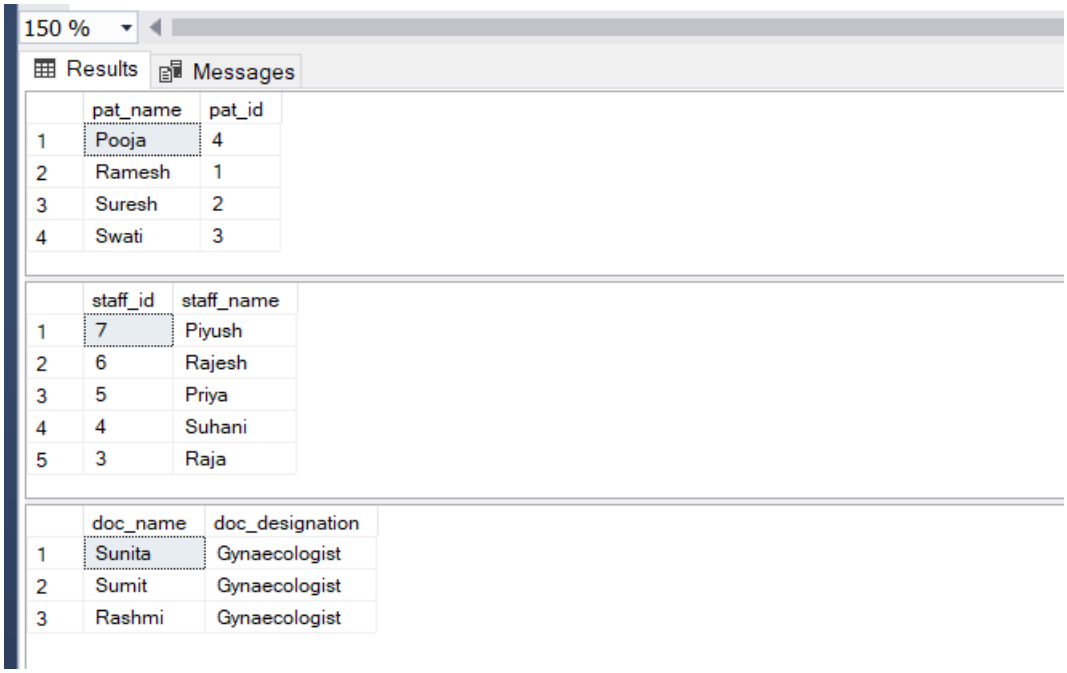
	(No column name)
1	800
2	100
3	1200
4	3000
5	3100

5. Write at least 3 nested queries using order by, group by and having clause.

Query:

```
select pat_name,pat_id from t1_patients
group by pat_name,pat_id having pat_id < 5
order by pat_name asc ;

select staff_id, staff_name from t1_staff
group by staff_id, staff_name having staff_id > 2
order by staff_id desc;

select doc_name,doc_designation from t1_doctor
group by doc_name,doc_designation having doc_designation='Gynaecologist'
order by doc_name desc;
```

Output:



	pat_name	pat_id
1	Pooja	4
2	Ramesh	1
3	Suresh	2
4	Swati	3

	staff_id	staff_name
1	7	Piyush
2	6	Rajesh
3	5	Priya
4	4	Suhani
5	3	Raja

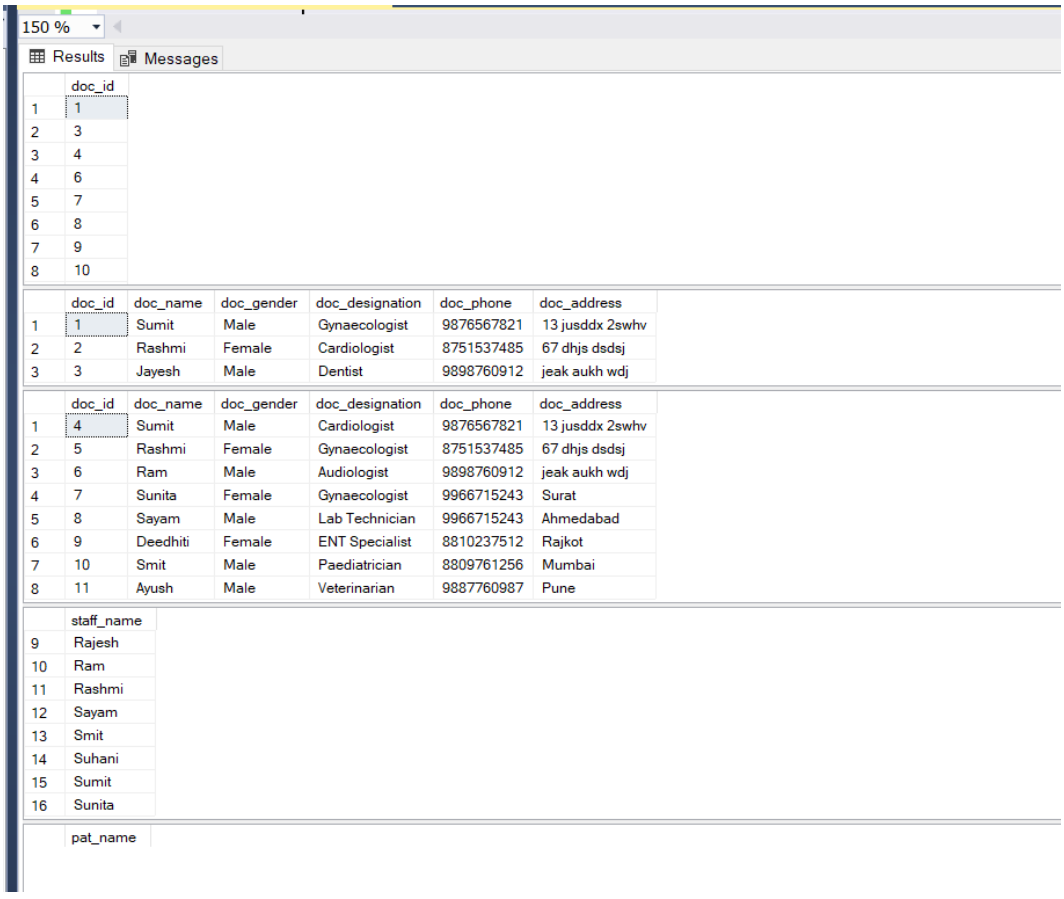
	doc_name	doc_designation
1	Sunita	Gynaecologist
2	Sumit	Gynaecologist
3	Rashmi	Gynaecologist

6. Illustrate the Usage of Except, Exists, Not Exists, Union, Intersection

Query:

```
select doc_id from t1_doctor
except select pat_id
from t1_patient_diagnosis

select * from t1_doctor
where exists(select doc_id
from t1_patients
where doc_id <5 and t1_doctor.doc_id=t1_patients.doc_id)

select * from t1_doctor
where not exists(select doc_id
from t1_patients
where doc_id <5 and t1_doctor.doc_id=t1_patients.doc_id)

select staff_name from t1_staff
union select doc_name
from t1_doctor

select pat_name from t1_patients
intersect select staff_name
from t1_staff;
```

Output:



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Results | Messages

	doc_id
1	1
2	3
3	4
4	6
5	7
6	8
7	9
8	10

	doc_id	doc_name	doc_gender	doc_designation	doc_phone	doc_address
1	1	Sumit	Male	Gynaecologist	9876567821	13 jusddx 2swhv
2	2	Rashmi	Female	Cardiologist	8751537485	67 dhjs dsdsj
3	3	Jayesh	Male	Dentist	9898760912	jeak aukh wdj

	doc_id	doc_name	doc_gender	doc_designation	doc_phone	doc_address
1	4	Sumit	Male	Cardiologist	9876567821	13 jusddx 2swhv
2	5	Rashmi	Female	Gynaecologist	8751537485	67 dhjs dsdsj
3	6	Ram	Male	Audiologist	9898760912	jeak aukh wdj
4	7	Sunita	Female	Gynaecologist	9966715243	Surat
5	8	Sayam	Male	Lab Technician	9966715243	Ahmedabad
6	9	Deedhiti	Female	ENT Specialist	8810237512	Rajkot
7	10	Smit	Male	Paediatrician	8809761256	Mumbai
8	11	Ayush	Male	Veterinarian	9887760987	Pune

	staff_name
9	Rajesh
10	Ram
11	Rashmi
12	Sayam
13	Smit
14	Suhani
15	Sumit
16	Sunita

	pat_name

7. INNER JOIN, LEFT OUTER JOIN, RIGHT OUTER JOIN- 3 queries for each instance

   a. **INNER JOIN**

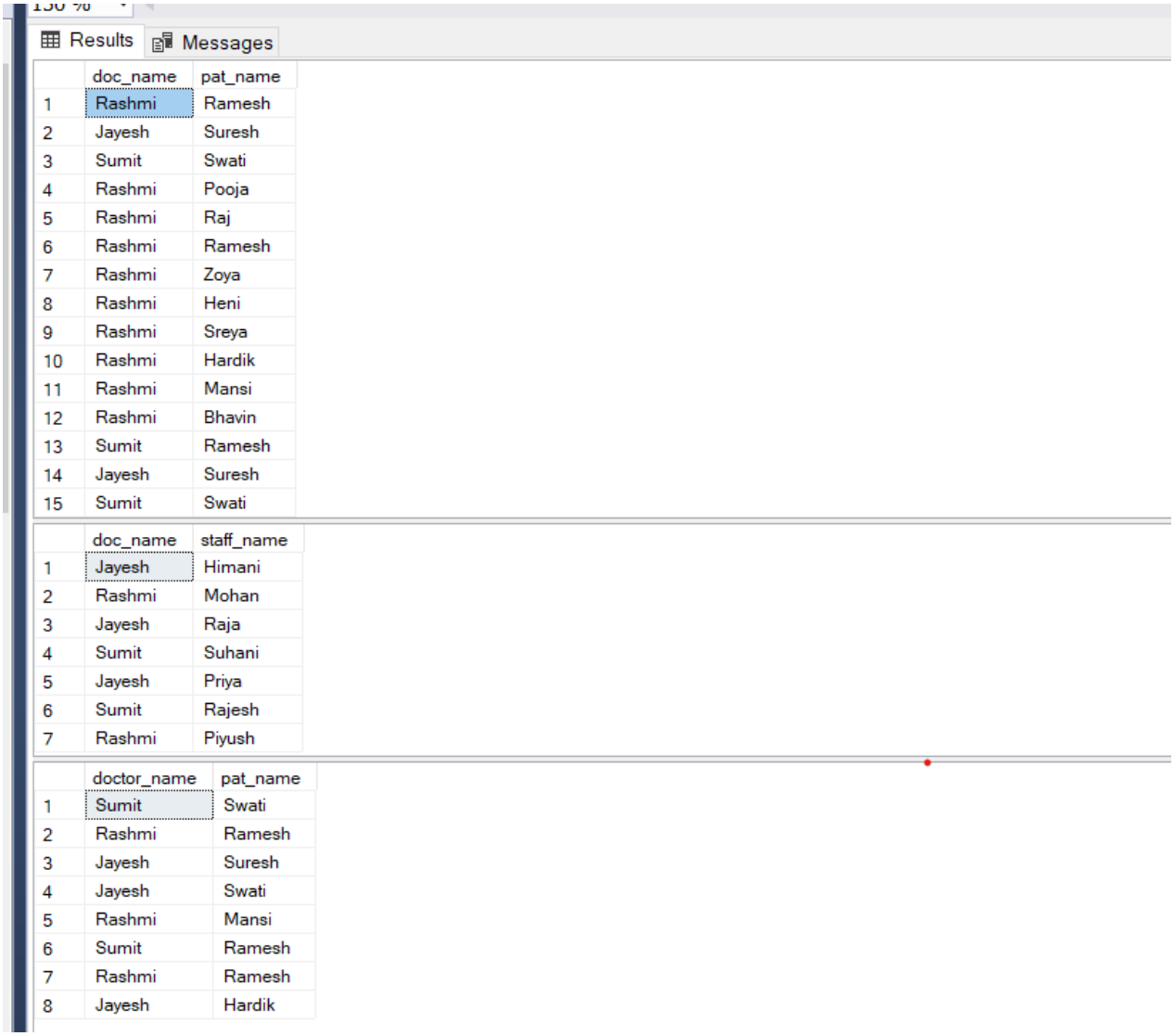
      Query:

```
select t1_doctor.doc_name,t1_patients.pat_name
from t1_patients
inner join t1_doctor on t1_doctor.doc_id=t1_patients.doc_id;

select t1_doctor.doc_name,t1_staff.staff_name
from t1_staff
inner join t1_doctor on t1_doctor.doc_id < 10 AND
t1_doctor.doc_id=t1_staff.doc_id;

select t1_bill.doctor_name,t1_patients.pat_name
from t1_bill
inner join t1_patients on t1_bill.amount > 500 AND
t1_bill.pat_id=t1_patients.pat_id;
```

      Output:



Results Messages

	doc_name	pat_name
1	Rashmi	Ramesh
2	Jayesh	Suresh
3	Sumit	Swati
4	Rashmi	Pooja
5	Rashmi	Raj
6	Rashmi	Ramesh
7	Rashmi	Zoya
8	Rashmi	Heni
9	Rashmi	Sreya
10	Rashmi	Hardik
11	Rashmi	Mansi
12	Rashmi	Bhavin
13	Sumit	Ramesh
14	Jayesh	Suresh
15	Sumit	Swati

	doc_name	staff_name
1	Jayesh	Himani
2	Rashmi	Mohan
3	Jayesh	Raja
4	Sumit	Suhani
5	Jayesh	Priya
6	Sumit	Rajesh
7	Rashmi	Piyush

	doctor_name	pat_name
1	Sumit	Swati
2	Rashmi	Ramesh
3	Jayesh	Suresh
4	Jayesh	Swati
5	Rashmi	Mansi
6	Sumit	Ramesh
7	Rashmi	Ramesh
8	Jayesh	Hardik

b. LEFT OUTER JOIN

Query:

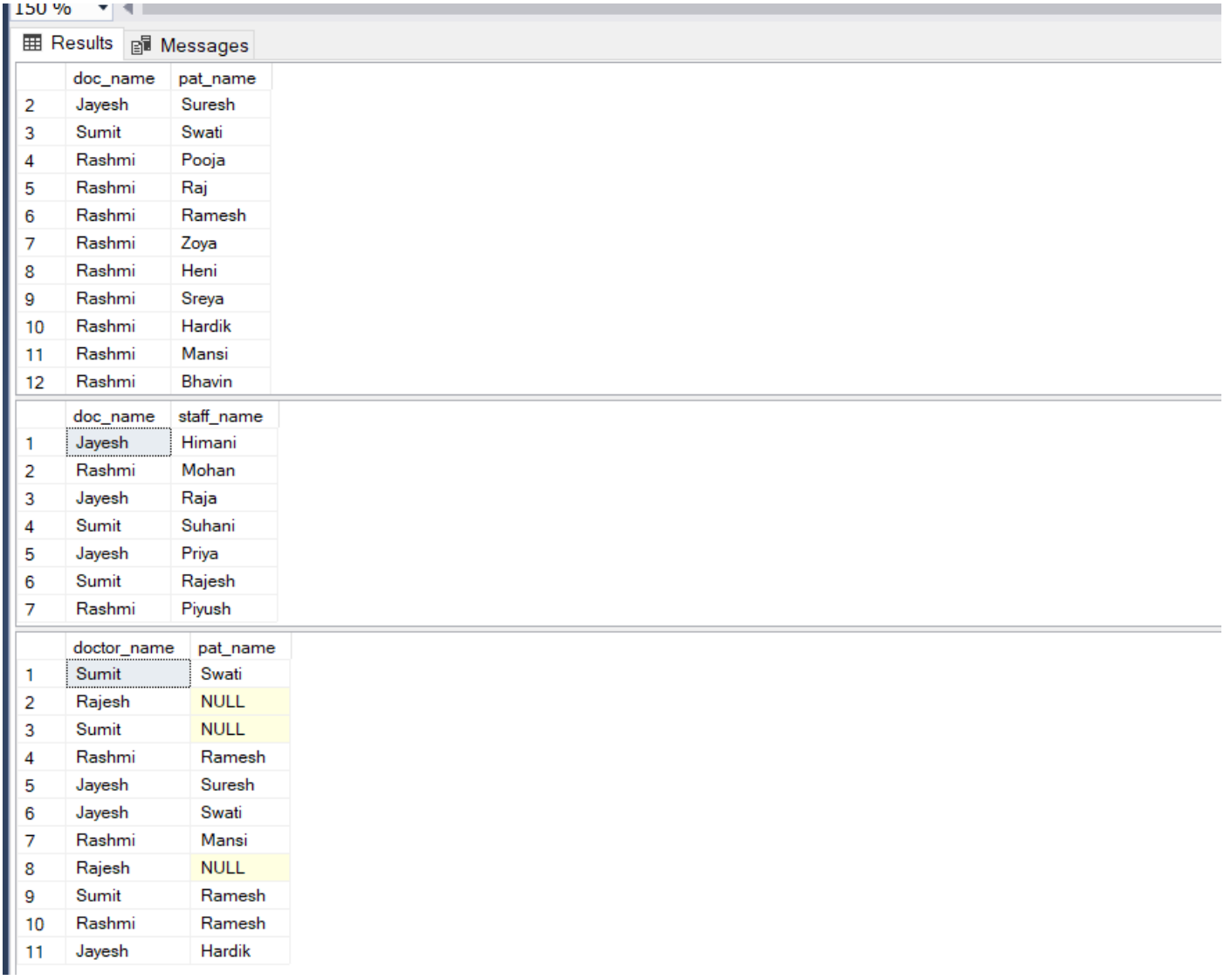
```
select t1_doctor.doc_name,t1_patients.pat_name
from t1_patients
left outer join t1_doctor on t1_doctor.doc_id=t1_patients.doc_id;

select t1_doctor.doc_name,t1_staff.staff_name
from t1_staff
left outer join t1_doctor on t1_doctor.doc_id < 10 AND
t1_doctor.doc_id=t1_staff.doc_id;

select t1_bill.doctor_name,t1_patients.pat_name
from t1_bill

left outer join t1_patients on t1_bill.amount > 500 AND
t1_bill.pat_id=t1_patients.pat_id;
```

Output:



150 %

Results | Messages

	doc_name	pat_name
2	Jayesh	Suresh
3	Sumit	Swati
4	Rashmi	Pooja
5	Rashmi	Raj
6	Rashmi	Ramesh
7	Rashmi	Zoya
8	Rashmi	Heni
9	Rashmi	Sreya
10	Rashmi	Hardik
11	Rashmi	Mansi
12	Rashmi	Bhavin

	doc_name	staff_name
1	Jayesh	Himani
2	Rashmi	Mohan
3	Jayesh	Raja
4	Sumit	Suhani
5	Jayesh	Priya
6	Sumit	Rajesh
7	Rashmi	Piyush

	doctor_name	pat_name
1	Sumit	Swati
2	Rajesh	NULL
3	Sumit	NULL
4	Rashmi	Ramesh
5	Jayesh	Suresh
6	Jayesh	Swati
7	Rashmi	Mansi
8	Rajesh	NULL
9	Sumit	Ramesh
10	Rashmi	Ramesh
11	Jayesh	Hardik

c. RIGHT OUTER JOIN

Query:

```
select t1_doctor.doc_name,t1_patients.pat_name
from t1_patients
right outer join t1_doctor on t1_doctor.doc_id=t1_patients.doc_id;

select t1_doctor.doc_name,t1_staff.staff_name
from t1_staff
right outer join t1_doctor on t1_doctor.doc_id < 10 AND
t1_doctor.doc_id=t1_staff.doc_id;

select t1_bill.doctor_name,t1_patients.pat_name
from t1_bill
right outer join t1_patients on t1_bill.amount > 500 AND
t1_bill.pat_id=t1_patients.pat_id;
```

Output:

150 %

Results | Messages

	doc_name	pat_name
1	Sumit	Swati
2	Sumit	Ramesh
3	Sumit	Swati
4	Sumit	Ramesh
5	Sumit	Swati
6	Rashmi	Ramesh
7	Rashmi	Pooja
8	Rashmi	Raj

	doc_name	staff_name
1	Sumit	Suhani
2	Sumit	Rajesh
3	Rashmi	Mohan
4	Rashmi	Piyush
5	Jayesh	Himani
6	Jayesh	Raja
7	Jayesh	Priya
8	Sumit	NULL

	doctor_name	pat_name
1	NULL	Ramesh
2	Jayesh	Suresh
3	NULL	Swati
4	NULL	Pooja
5	NULL	Raj
6	NULL	Ramesh
7	NULL	Zoya
8	NULL	Heni
9	NULL	Sreya
10	Jayesh	Hardik
11	NULL	Mansi
12	NULL	Bhavin
13	NULL	Ramesh
14	NULL	Suresh
15	Sumit	Swati
16	Jayesh	Swati
17	NULL	Pooja

Query executed successfully.

8. Use all the above condition in JOIN as well.

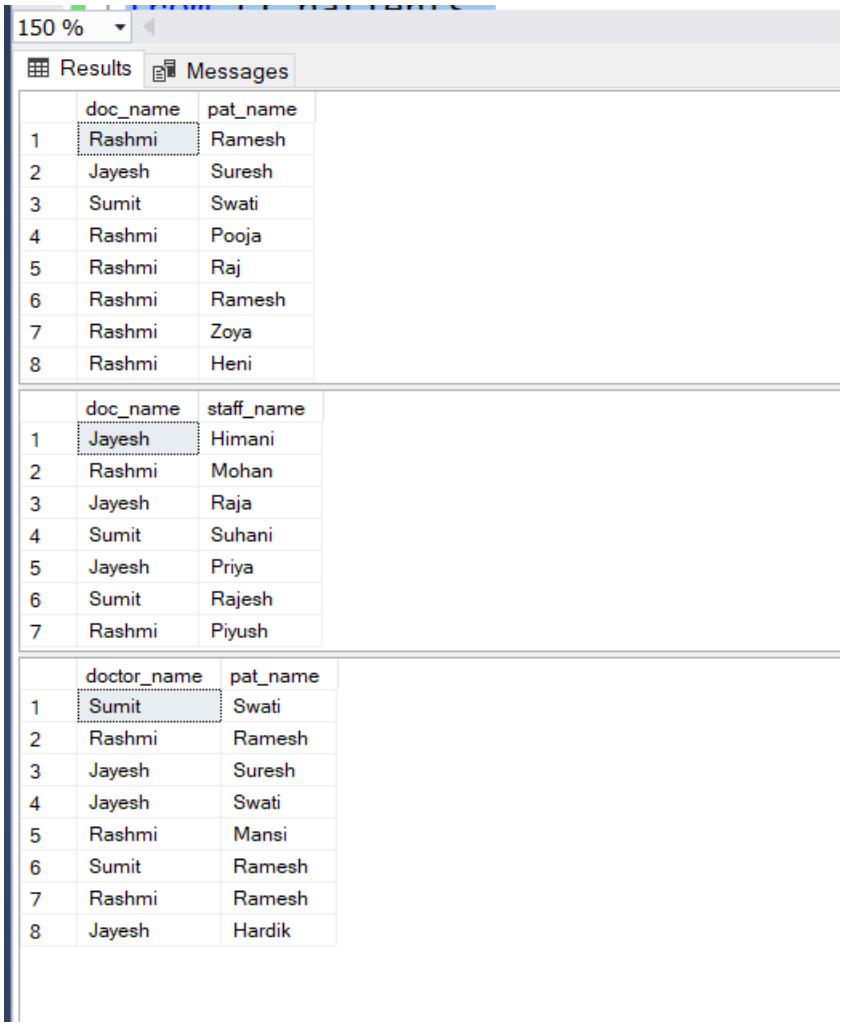
Query:

```
select t1_doctor.doc_name,t1_patients.pat_name
from t1_patients
join t1_doctor on t1_doctor.doc_id=t1_patients.doc_id

select t1_doctor.doc_name,t1_staff.staff_name
from t1_staff
join t1_doctor on t1_doctor.doc_id < 10 AND t1_doctor.doc_id=t1_staff.doc_id

select t1_bill.doctor_name,t1_patients.pat_name
from t1_bill
join t1_patients on t1_bill.amount > 500 AND t1_bill.pat_id=t1_patients.pat_id
```

Output:



150 %

Results | Messages

	doc_name	pat_name
1	Rashmi	Ramesh
2	Jayesh	Suresh
3	Sumit	Swati
4	Rashmi	Pooja
5	Rashmi	Raj
6	Rashmi	Ramesh
7	Rashmi	Zoya
8	Rashmi	Heni

	doc_name	staff_name
1	Jayesh	Himani
2	Rashmi	Mohan
3	Jayesh	Raja
4	Sumit	Suhani
5	Jayesh	Priya
6	Sumit	Rajesh
7	Rashmi	Piyush

	doctor_name	pat_name
1	Sumit	Swati
2	Rashmi	Ramesh
3	Jayesh	Suresh
4	Jayesh	Swati
5	Rashmi	Mansi
6	Sumit	Ramesh
7	Rashmi	Ramesh
8	Jayesh	Hardik