

CS4.301: Data and Applications (Monsoon 2022)

Quiz - 4

Name:

Time: 30 minutes

Roll No.

Maximum Marks: 20

1. Given the below database, answer the following questions. **(4+2)**
 - a. What outputs would you get for the following queries:
 - i. `SELECT * FROM A JOIN B ON A.a = B.b;`
 - ii. `SELECT * FROM A LEFT JOIN B ON A.a = B.b;`
 - iii. `SELECT * FROM A RIGHT JOIN B ON A.a = B.b;`
 - iv. `SELECT * FROM A NATURAL JOIN B;`
 - b. Explain why different outputs are the same or why they are different.

A

a	b	c1
1	1	2
2	1	1
3	2	3
4	4	4

B

a	b	c2
2	1	9
2	1	6
3	2	8
4	5	7

2. Answer the following questions if the listed query is executed on the database given in the previous question. **(2+3)**

a. `select min(c2), avg(c2), sum(Aa+Ab+Ba) from (select A.a as Aa, A.b as Ab, B.a as Ba, c1, c2, A.a+B.b as x from A left join B on A.c1 = B.a) X group by x;`

i. How many NULL values appear in the output?

ii. In how many rows are all values the same?

In other words, how many rows are there in the output of the following query:

```
select * from (select min(c2) as p1, avg(c2) as p2,
sum(Aa+Ab+Ba) as p3 from (select A.a as Aa, A.b as Ab, B.a as
Ba, c1, c2, A.a+B.b as x from A left join B on A.c1 = B.a) X group
by x) P where p1=p2 and p2=p3;
```

b. `select avg(X.Bb) from (select A.a as Aa, A.b as Ab, B.a as Ba, B.b as Bb, c1, c2, A.a+B.b as x from A right join B on A.b = B.a) X left join A on ((2*A.a+X.c2)/2)>(2*A.c1) group by A.c1;`

i. What is the output of the above query?

3. Convert the below relation into 1NF and 2NF forms. Describe what problems 1NF and 2NF forms avoid that the original database was susceptible to.

(4+2)

<u>Student_ID</u>	Phone Number	Cluster	Apex
2025101110	(9938901015, 9394565700)	1	Rohan
2025101065	(8096756525)	2	Tanvi
2025113021	(7896969420, 8175798520, 9786484547)	3	Aakash
2025115005	(9119110808)	1	Rohan
2025102043	(8956566123)	1	Rohan
2025101114	(7807904040)	2	Tanvi
2025111001	(9949599090)	2	Tanvi

4. What does the `getCount()` API endpoint do? Why did Facebook decide to include `getCount()`, and how was their backend modified to support it? (3)