

Computer Science & IT

Database Management System

Query Languages

Lecture No. 08



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Recap of Previous Lecture



Topic

Execution of correlated sub-query

Topic

AS clause

Topic

WITH clause

Topics to be Covered



- * **Topic** Comparison with NULL
- * **Topic** Comparison with regular expression
- * **Topic** Practice questions



Topic : Comparison with NULL ✓

- * NULL is a non-zero unknown value.
and no two NULL are equal

→ Note:- To Compare with NULL ,
operator used is " IS "

Complement of " IS " is " IS NOT "

EMP

Eid	Ename	Pass-NO
E1	Amit	12345
E2	Ram	NULL
E3	Anand	27935
E4	Anmol	85834
E5	Ramanand	76349

Correct Query:

```
Select Eid  
From EMP  
Where Pass-No IS NULL
```

Query: Retrieve Eids of the employee with no passport.

```
Select Eid  
From EMP
```

```
Where Pass-No = NULL
```

← Wrong because no two NULL are equal

```
Select Eid  
From EMP
```

```
Where Pass-No = 0
```

← Wrong because NULL is non-Zero

EMP

Eid	Ename	Pass-NO
E1	Amit	12345
E2	Ram	NULL
E3	Anand	27935
E4	Anmol	85834
E5	Ramanand	76349

Query: Retrieve Eids of the employee with a valid Passport

Select Eid
From EMP
Where Pass-NO IS NOT NULL

EMP

Eid	Ename	Pass-NO
E1	Amit	12345
E2	Ram	NULL
E3	Anand	27935
E4	Anmol	85834
E5	Ramanand	76349

Query: Retrieve Eids of the employee whose name is Ram

Select Eid
From EMP
Where Ename = 'Ram'



Topic : Regular expression



Under score

'_': Under score represent exactly one character.

'%' :- Represent 0 or more character
 any number

* Write the regular expression for the names

Starting with A = 'A %'

first character must be A after 'A'; there may be any number of characters

EMP

Eid	Ename	Pass-NO
E1	Amit	12345
E2	Ram	NULL
E3	Anand	27935
E4	Anmol	85834
E5	Ramanand	76349

Query: Retrieve Eids of the employees whose name starts with A

~~Select Eid
from EMP
Where Ename = 'A%'~~

Wrong, because → ↑ it is the operator to check equality



Topic : Comparison with Regular expression

To compare with regular expression
operator used is 'LIKE'

Complement of 'LIKE' is 'NOT LIKE'

④ Write the regular expression for the names in which 3rd character from the last is 'e', and contains at least '8' characters.

(% _____ e ___)

(_____ % e ___)

(_____ % _____ e ___)

EMP

Eid	Ename	Pass.no
E ₁	Amit	123
E ₂	Anand	379
E ₃	Ramesh	NULL
E ₄	Raghvendra	239
E ₅	Amitabh	386
E ₆	Anuj	240

- * Retrieve the records of Employee whose name contains exactly 4 letters

Select *

From EMP

Where Ename LIKE '----'

- * Retrieve record of the Employee whose name start with R, third letter from the last is 'd', and contain at least 8 letters.

Select *

From EMP

Where Ename LIKE 'R%---d--'

EMP

Eid	Ename	Pass.no
E ₁	Amit	123
E ₂	Anand	379
E ₃	Ramesh	NULL
E ₄	Raghvendra	239
E ₅	Amitabh	386
E ₆	Anuj	240

* Retrieve the records of Employee
whose name does not start
with alphabet 'R'

Select *

From EMP

Where Ename NOT LIKE 'R %'

#Q.

Consider the relational database with the following four schemes and their respective instances.



Student(sNo, sName, dNo) **Dept**(dNo, dName)

Course(cNo, cName, dNo) **Register**(sNo, cNo)

Student		
<u>sNo</u>	sName	dNo
S01	James	D01
S02	Rocky	D01
S03	Jackson	D02
S04	Jane	D01
S05	Milli	D02

Dept	
<u>dNo</u>	dName
D01	CSE
D02	EEE

Course		
<u>cNo</u>	cName	dNo
C11	DS	D01
C12	OS	D01
C21	DE	D02
C22	PT	D02
C23	CV	D03

Register	
<u>sNo</u>	<u>cNo</u>
S01	C11
S01	C12
S02	C11
S03	C21
S03	C22
S03	C23
S04	C11
S04	C12
S05	C11
S05	C21

Question Continues in Next Slide

#Q.

SQL Query:

Main query {

SELECT * FROM Student AS S

WHERE NOT EXIST

Sub-query 1

(SELECT cNo FROM Course WHERE dNo = "D01")

EXCEPT (Minus)

Sub-query 2

(SELECT cNo FROM Register WHERE sNo = S.sNo)

The number of rows returned by the above SQL query is ____.

it is an independent sub-query

∴ it will execute first

o/p will be CND of all the Courses
of department D01

o/p = { C11, C12 }

Attribute
from
register
table∴ it is a
Correlated Sub-queryAttribute SNO
from table S

#Q.

Consider the relational database with the following four schemes and their respective instances.

Student(sNo, sName, dNo) Dept(dNo, dName)

Course(cNo, cName, dNo) Register(sNo, cNo)

Student		
<u>sNo</u>	sName	dNo
S01	James	D01
S02	Rocky	D01
S03	Jackson	D02
S04	Jane	D01
S05	Milli	D02

Register	
<u>sNo</u>	<u>cNo</u>
S01	C11
S01	C12
S02	C11
S03	C21
S03	C22
S03	C23
S04	C11
S04	C12
S05	C11
S05	C21



Question Continues in Next Slide

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Consider the relational database with the following four schemes and their respective instances.

Student(sNo, sName, dNo) Dept(dNo, dName)

Course(cNo, cName, dNo) Register(sNo, cNo)

Student		
<u>sNo</u>	sName	dNo
S01	James	D01
S02	Rocky	D01
S03	Jackson	D02
S04	Jane	D01
S05	Milli	D02

Register	
<u>sNo</u>	<u>cNo</u>
S01	X C11
S01	X C12
S02	✓ C11
S03	X C21
S03	X C22
S03	X C23
S04	X C11
S04	X C12
S05	X C11
S05	X C21

Question Continues in Next Slide

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Consider the relational database with the following four schemes and their respective instances.



Student(sNo, sName, dNo) **Dept**(dNo, dName)

Course(cNo, cName, dNo) **Register**(sNo, cNo)

Student		
<u>sNo</u>	sName	dNo
S01	James	D01
S02	Rocky	D01
S03	Jackson	D02
S04	Jane	D01
S05	Milli	D02

Register	
<u>sNo</u>	<u>cNo</u>
S01	C11
S01	C12
S02	C11
S03	C21
S03	C22
S03	C23
S04	C11
S04	C12
S05	C11
S05	C21

Question Continues in Next Slide

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Consider the relational database with the following four schemes and their respective instances.

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Course(cNo, cName, dNo) Register(sNo, cNo)

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<u>sNo</u>	sName	dNo
S01	James	D01
S02	Rocky	D01
S03	Jackson	D02
S04	Jane	D01
S05	Milli	D02

Register	
<u>sNo</u>	<u>cNo</u>
S01	C11
S01	C12
S02	C11
S03	C21
S03	C22
S03	C23
S04	C11
S04	C12
S05	C11
S05	C21

Question Continues in Next Slide

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Consider the relational database with the following four schemes and their respective instances.

Student(sNo, sName, dNo) Dept(dNo, dName)

Course(cNo, cName, dNo) Register(sNo, cNo)

Student		
<u>sNo</u>	sName	dNo
S01	James	D01
S02	Rocky	D01
S03	Jackson	D02
S04	Jane	D01
S05	Milli	D02

Register	
<u>sNo</u>	<u>cNo</u>
S01	C11
S01	C12
S02	C11
S03	C21
S03	C22
S03	C23
S04	C11
S04	C12
S05	C11
S05	C21

Question Continues in Next Slide

#Q.

SQL Query:

Main query {

SELECT * FROM Student AS S

WHERE NOT EXIST

Sub-query 1

(SELECT cNo FROM Course WHERE dNo = "D01")

EXCEPT (Minus)

Sub-query 2

(SELECT cNo FROM Register WHERE sNo = S.sNo)

The number of rows returned by the above SQL query is ____.

it is an independent sub-query

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o/p will be CND of all the Courses
of department D01

o/p = { C11, C12 }

Attribute
from
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Correlated Sub-queryAttribute SNO
from table S

#Q.

Consider the relational database with the following four schemes and their respective instances.



Student(sNo, sName, dNo) Dept(dNo, dName)

Course(cNo, cName, dNo) Register(sNo, cNo)

(O/P of Sub-query 1) - (O/P of Subquery 2) = O/P of inner query

Minus

O/P of

NOT EXISTS

Register	
sNo	cNo
S01	C11
S01	C12
S02	C11
S03	C21
S03	C22
S03	C23
S04	C11
S04	C12
S05	C11
S05	C21

Student		
sNo	sName	dNo
S01	James	D01
S02	Rocky	D01
S03	Jackson	D02
S04	Jane	D01
S05	Milli	D02

$$\begin{aligned} \{C11, C12\} - \{C11, C12\} &= \emptyset \quad \therefore \text{True} \\ \{C11, C12\} - \{C11\} &= \{C12\} \quad \therefore \text{False} \\ \{C11, C12\} - \{C21, C22, C23\} &= \{C11, C12\} \quad \therefore \text{False} \\ \{C11, C12\} - \{C11, C12\} &= \emptyset \quad \therefore \text{True} \\ \{C11, C12\} - \{C11, C21\} &= \{C12\} \quad \therefore \text{False} \end{aligned}$$

Final O/P =

sNo	sName	dNo
S01	James	D01
S04	Jane	D01

No. of Rows = 2

Question Continues in Next Slide

#Q.
H.W.

Consider The Following Relational Scheme

- (A) Student (school-id, sch-roll-no, sname, saddress)
- (B) School (school-id, sch-name, sch-address, sch-phone)
- (C) Enrolment (school-id, sch-roll-no, erollno, examname)
- (D) ExamResult (Erollno, examname, marks)

Sch-name may be same
for two schools with

different school-id

(A) for each school with more than 200 students appearing in exams, the name of the school and the number of 100s scored by its students

(B) for each school with more than 200 students in it, the name of the school and the number of 100s scored by its students

(C) for each school with more than 200 students in it, the name of the school and the number of its students scoring 100 in at least one exam

(D) nothing; the query has a syntax error

#Q.

What does the following SQL query output?

```
SELECT sch-name, COUNT(*)  
FROM School C, Enrolment E, ExamResult R  
WHERE E.school-id = C.school-id  
      AND  
      E.examname = R.examname  
      AND  
      E.erollno = R.erollno  
      AND  
      R.marks = 100  
      AND  
      E.school-id IN  
          (SELECT school-id  
           FROM student GROUP BY school-id HAVING COUNT(*) > 200)  
GROUP By school-id
```

H.W.

For option 'B' to be true

What changes needs to be performed in the query
When

- (i) Sch-name may be same for schools with different school-id
- (ii) Sch-name are also unique

)

#Q.

H.W.

Consider the following relational schema:

Suppliers(sid:integer, sname:string, city:string, street:string)

Parts(pid:integer, pname:string, color:string)

Catalog(sid:integer, pid:integer, cost:real)

[MCQ: 2009: 2M]



Consider the following relational query on the above database:

```

SELECT S.sname
  FROM Suppliers S
 WHERE S.sid NOT IN
       (SELECT C.sid
        FROM Catalog C
        WHERE C.pid NOT IN
              (SELECT P.pid
               FROM Parts P
               WHERE P.color <> 'blue'))
    
```

(Options on the
Next slide)

Hint: Just provide your answer

(None of the option given may be true)

Question Continues in Next Slide

#Q.

Assume that relations corresponding to the above schema are not empty. Which one of the following is the correct interpretation of the above query?

- A. Find the names of all suppliers who have supplied a non-blue part.
- B. Find the names of all suppliers who have not supplied a non-blue part.
- C. Find the names of all suppliers who have supplied only blue parts.
- D. Find the names of all suppliers who have not supplied only blue parts.



2 mins Summary



- * **Topic** Comparison with NULL
- * **Topic** Comparison with regular expression
- * **Topic** Practice questions

THANK - YOU