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Assignment 4

SQL Queries - group functions, join and nested queries

Aim: Write suitable select command to get requested data from tables

Objective: To study subqueries, group, Joins and views

Problem statement:
Create tables and solve given queries using group, Joins and views

Theory:

SQL Joins:
Join operations take two relations and return as a result another relation. It is a cartesian product which requires that tuples in the two relations match (under some condition). It also specifies the attributes that are present in the result of the join
Join condition - defines which tuples in the two relations match, and what attributes are present in result of the join.
Join type - defines how tuples in each relation that do not match in the relation are treated.

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Types of Joins :

1) Cross Join

- Cross JOIN is simplest form of JOIN, which matches each row from one database table to all rows of another as a cartesian product. The cross join does not establish a relationship between the joined tables.

Sx: `SELECT * FROM 'Movies' CROSS JOIN 'Artist';` or
`SELECT * FROM , 'Movies', 'Artist';`

Movies

Movie-id	Title	Category
1	A	X
2	B	X

Artist

Id	Fname	Lname	movie id
1	Adam	Smith	1
2	Kavi	Kumar	2

Cross Join

Movie-id	Title	Category	Id	Fname	Lname	Movie-id
1	A	X	1	Adam	Smith	1
1	A	X	2	Kavi	Kumar	2
2	B	X	1	Adam	Smith	1
2	B	X	2	Kavi	Kumar	2

2) Inner Join

- Used to return rows from both tables that satisfy the given condition (join condition on common column)

Sx: ~~to~~ `SELECT * FROM movies INNER Join 'artist' on movies.movie-id = Artist.movie-id`

OR

SELECT * FROM movies, Artist
where movies.movieId = Artist.movie-id;

Movie-id	Title	Category	Id	Fname	Lname	Movie-id
1	A	X	1	Adam	Smith	1
2	B	X	2	Ravi	Kumar	2

Outer Join

- Extension of join operation that avoids loss of information
- Returns all records matching from both tables. It can detect records having no match in joined table. It returns NULL values for records of joined table if no match is found.

Course

course-id	Title	dept-name	credits
301	Genetics	Biology	4
190	Game Design	CompSci	4
315	Robotics	CompSci	3

Prereq:

course-id	prereq-id
301	B-101
190	C-101
347	C-101

Natural left outer join

course-id	title	dept-name	credits	prereq-id
301	Genetics	Biology	4	B-101
190	Game Design	CompSci	4	C-101
315	Robotics	CompSci	3	NULL

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Natural right outer join

course-id	title	dept-name	credits	prereq-id
301	Genetics	Biology	4	B-101
190	Game Design	Comp-sci	4	C-101
347	NULL	NULL	NULL	C-101

Full outer join

course-id	title	dept-name	credits	prereq-id
301	Genetics	Biology	4	B-101
190	Game Design	Comp. Sci	4	C-101
315	Robotics	Comp. Sci	3	NULL
347	NULL	NULL	NULL	C-101

FAQs

Q When to use self join ? How does it differ from other joins ?

Ans - self join is used when a table is joined with itself to query hierarchical data or compare rows within the same table. It differs from other joins as it involves joining a table with itself rather than with another table.

Q. compare cross join with ~~no~~ natural join

Cross Join : Cartesian product of two tables ; all possible combinations are returned.

Natural Join : Joins two tables based on same-named columns ; it returns rows with the same values in common columns

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Q. What is the importance of SQL joins in database management.

Ans. SQL joins enable the retrieval of data from multiple tables simultaneously, facilitating the analysis of complex relationships and providing a comprehensive view of interconnected data.

Q. What are different types of Joins!
Q. Difference b/n Inner and Left Join!
Q. Difference b/n left and right Join!

} Discussed in Theory section.