

Assignment No.2

classmate

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Date _____

Page _____

DDL

a) Order (Order-id, Customer-id, Employee-id,
shipping-id, Order-date)

Customer (Customer-id, Customer-name,

Address, city, PostalCode, Country)

a) write a query for left outer join

⇒ select * from Order left outer join Customer
on Order.customer_id = Customer.customer_id;

b) write a query for natural join

⇒ select * from Order

natural join

select * from Customer;

select * from Order natural join Customer;

c) write a query for rename customers table
to customer_Data

⇒ alter table customer rename to customer_data;

SQL rename table customer to customer_data;

Relational OR
Algebra
for R.O.

g (customer, customer-data);
table

d) write a query to delete a record from
the order table

⇒ select * from

delete * from order where order-id = 2;

Q.2) Write a short note on Fundamental relational operations.

Fundamental operators -

select, project & rename are called unary operation because they operate on relation & other operation operate on pair of relations.

∴ Therefore they are called binary operation.

① select operation

The select operation* select tuple that satisfy a given predicate by use the lowercase greek letter ' δ ' to denote selection.

The predicate appears as subscript to Sigma. The argument relation is in parenthesis after the sigma. Thus δ_{physics} to select those tuples of the instructor relation where the instructor is in physics department.

$\delta_{(\text{department_name} = \text{physics})}(\text{Instructor})$

② project operation (Π)

Suppose we want to list out instructor id, name and salary but we do not care about department name.

This condition is satisfied by project operation. The project operation allows

us to produce this relations.

It is a unary operation that written it argument relation. we certain attribute left out.

since a relation is a set any duplicate rows are eliminated project, is denoted by uppercase greek letter Π .

we list those attributes that we wish to appear in the result as subscript to ' Π '.

$\Pi id, salary, name (Instructor)$

$\Pi id, name, mobileno (Customer-data)$

③ Set differences operation.

The set difference operation denoted by '-' sign.

This allows us to find tuples that are in one relation but are not in other relation.

The expression $R-S$ produces a relation containing thosei are in R but not in S .

rename :

Fundamental operators

select

Project

rename

set diff.

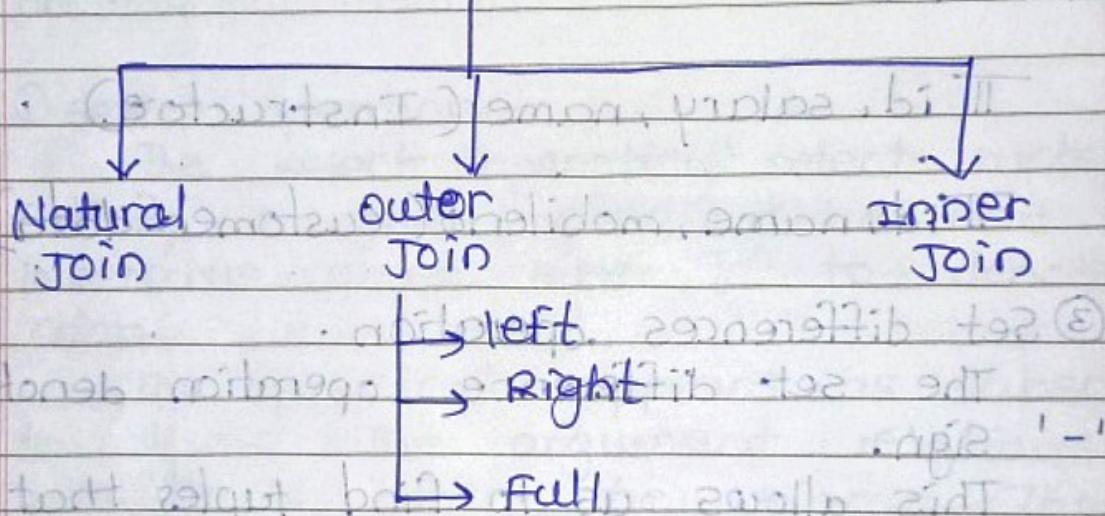
Q. 3) Write short note on join operations.

→ A join operation combines related tuples from different relations iff a given join condition is satisfied.

It is denoted by \bowtie

Types of join operation

Join operation



1. Natural join -

A natural join is the set of tuples of all combination in R and S that are equal on their common attribute names.

- It is denoted by \bowtie
- output will be as removed duplicate common columns, it will be shown only once.
- Example

Employee

Emp-code	Emp-name
101	Stephan
102	Jack
103	Harry

Salary

Emp-code	Salary
101	50,000
102	30,000
103	25,000

Input : Emp-name , Salary (Employee \bowtie salary)

Output :

Emp-name	salary
Stephan	50,000
Jack	30,000
Harry	25,000

2. Outer join

The outer join operation is an extension of the join operation. It is used to deal with missing information.

Example

Consider above Employee & Salary table.

Fact-workers

Input -

(Employee \bowtie 1 Fact-workers)

output -

Emp-name	street	city	Branch	Salary
Ram	civil line	Mum-bai	Infosys	10,000

An outer join is basically of three types -

1. left outer join

2. Right outer join

3. Full outer join

a. Left outer join -

- Left outer join contains the set of tuples of all combinations in R & S that are equal on their common attribute name.
- In the left outer join, tables in R have no matching tuples in S.

- It is denoted by \bowtie_{left} .
- Example - using the above Employee table & Fact-workers table.

Input-output -

Input - Select * from Employee left join Fact-workers ;

Output -

Emp-name	street	city	Branch	salary
Ram	civil line	mursi bai	Infasys	10,000
shyam	Parkstreet	kolkata	Null	Null

b. Right outer join -

- Right outer join contains the set of tuples of all combinations in R and S

that are equal on their common attribute names.

- In the right outer join tuples in S have no matching tuples in R.
- It is denoted by \bowtie^+ .

Example : Using the above Employee table & Fact-workers relation.

Input - Employee \bowtie^+ Fact-workers

output:

Emp-name	Branch	salary	street	city
Ram	Infosys	10,000	Civil line	Mumbai
Hari	TCS	50,000	Null	Null

c. Full outer join -

- Full outer join is like a left or right join except that it contains all rows from both.
- In full outer join, tuples in R that have ~~no~~ ~~s~~ that matching tuples in S and tuples in S that have no matching tuples in R in their common attribute name.
- It is denoted by \bowtie .
- Example - using the above Employee table & Fact-workers.

i. Employee \bowtie fact-workers

Emp-name	street	city	Branch	salary
Ram	Civil line	Mumbai	Infosys	10,000
Shyam	Park street	Kolkata	Null	Null
Hari	Null	Null	TCS	50,000

3. Equi join - result as loops on both

- It is also known as an inner join.
- + It is the most common join. It is based on matched data as per the equality condition.
- The equi join uses the comparison operator (=).

Example -

customer Relation : Product

class-ID	Name	Product-ID	city
1	John	1	Delhi
2	Harry	2	Mumbai
3	Jackson	3	Noida

Input

customer \bowtie product

class-ID	Name	Product-ID	city
1	John	1	Delhi
2	Harry	2	Mumbai
3	Jackson	3	Noida

Syntax -

select column-list from table-1
equi join

select column-list from table-2
where ↓ column of table = common colu
common ↓ me in table

Q.4) Difference betⁿ tuple and ~~calculas~~ domain relational calculus.

→ ↗

Tuple . relational calculus

Domain: Relational calculus

1. The tuple relational calculus (TRC) is used to select tuples from a relation. The tuples with specific range values, tuples with certain attribute values, & so on can be selected.

1. The domain relational calculus (DRC) employs a list of attributes from which to choose based on the condⁿ. It's similar to TRC, but instead of selecting entire tuples, it selects attributes.

2. In TRC, the variables represent the tuples from specified relations.

2. In DRC, the variable represent the value drawn from a specified domain.

3. A tuple is a single element of relation. In db terms, it is a row.

A domain is equivalent to column data type. If any constraints on the value of data.

4. This filtering variable uses a tuple of relatⁿ.

This filtering is done based on the domain of attributes.

5. The query cannot

The query can be expe-

expressed using a membership condⁿ.

ssed using a membership condition.

6. Notation:

$\{T | P(T)\}$ or

$\{T | \text{condition}(T)\}$

$\{a_1, a_2, a_3, \dots, a_n | P(a_1, a_2, a_3, \dots, a_n)\}$

7. $\{T | \text{Employee}(T)$

AND $T.\text{DEPT-ID} = 10\}$

$\{t | \text{Employee} > \text{DEPT-ID} = 10\}$

8. Focuses on selecting tuples from a relation.

Focuses on selecting values from a relation.

9. uses tuple variable. (e.g t)

uses scalar variable (e.g a_1, a_2, \dots, a_n)

10. Less expressive.

More expressive.

11. Easier to use for simple queries.

More difficult to use for simple queries.

12. Useful for selecting tuples that satisfy a certain condⁿ or for retrieving a subset of a relation.

useful for selecting specific values or for constructing more complex queries that involve multiple relations.

Q.5) Short note on Aggregate function.

- - An aggregate function is mathematical function computation involving a range of values.
- That result is just single value expressing the significance of the accumulated data it is derived from it.
- Aggregate functions are often used to derive description statistics.
- Aggregate functions are often used in db sw packages now common in the workplace.
- Aggregate functions are used extensively in economics & finance to provide the key numbers that represent economic health or market performance.
- Aggregate functions deliver a single number to represent a longer data set. The number being used may themselves be produced by aggregate function.
- Many descriptive statistics are the result of aggregate function.
- Economists use the output of the data aggregation to plot changes over time & project future trends.
- The models created out of aggregate data can be used to influence policy & business decision.

Ans