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SQL

Databases that uses SQL

1) SQL server
2) Oracle
3) MySQL
4) Postgre SQL
5) SQLite
6) DB2
7) BigData

* Tools to work with SQL
  SSMS
* SQL Workbench
* SQL developer
* Toad

~~create~~

Database Creation

① Create database _____
(Database name)

② Create table _____

③ ~~how to use~~ (tablename)

④ insert into _____
(table, database
(column, col2, col3 ...)

⑤ To display
Select * from customer
(full)

where col1 = ' '
col2 = ' '

⑤ Update

⑥ Delete

* Count

The COUNT function returns the number of input rows that match a specific condition of a query

Select count (Distinct ____) from ____
columnname tablename

↳ Distinct value ka count dega jo ek column me hongi

Select where

* Select ~~where~~ ____, col2 from tablename where
col1
col1 = ' ', col2 = ' ';

* Order by

Ascending/descending order of colm

order by ____ ASC, DESC
columnname 1, col2

Limit

⇒ last command to be ~~ex~~ executed, goes to the end of the query.

BETWEEN.

value < low or value > high

IN

- In certain cases, you want to check for multiple possible value options, for ex:- if user's name shows up IN a list of known names.
- We can use the IN operator to create a condition that checks to see if a value is included in a list of multiple options.

Ex:- select color from Table
where color IN ('red', 'blue', 'green')

LIKE & ILIKE

('A%'), ('%a')

LIKE → case sensitive
ILIKE → incase sensi

Group By

Aggregate function

Avg() Sum()
Count()
Max()
Min()

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- Aggregate function call happens only in the SELECT clause or the HAVING Clause.

group by

Having

(1) JOINS

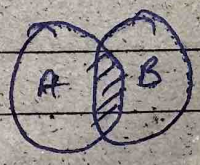
- Creating an alias with AS clause.
- Understanding diff kinds of joins
  - → INNER
  - → OUTER
  - → FULL
  - → UNION

Alias AS is assigned at very end.

2(a) INNER JOIN

Simpler joins

```
Select A, B, C, D - - - from Table 1
Inner join Table 2
ON Table 1.A = Table 2.A
```



2(b) OUTER JOIN

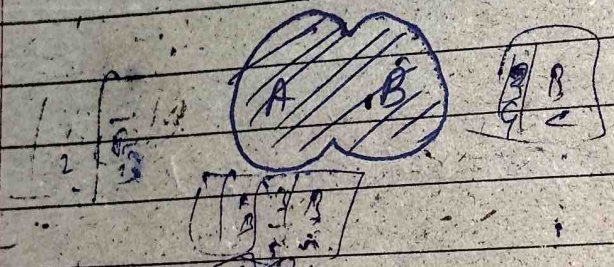
→ Full Outer join

→ Left outer join

→ Right outer join ⇒ (opposite of inner join)

Full Outer join

Select * from Table A/B
Full Outer join Table B/A
on Table A. col_match = Table B. col_match.



Select * from Table A
Full Outer Join Table B
on Table A. col_match = Table B. col_match.
where Table. id is null or Table B. id is

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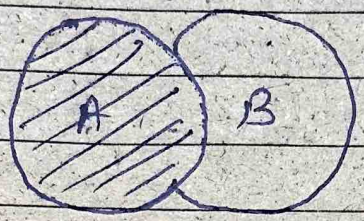
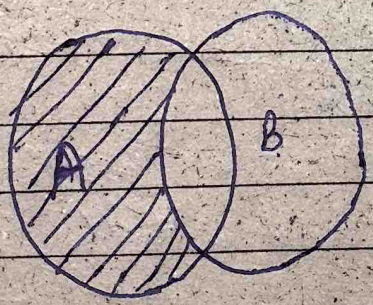
Left Outer join

A LEFT Outer join results in the set of records that are in the left table, if there is no match with the right table, the results are null.

```
Select * from Table A.
Left Outer Join Table B
on Table A.col_match = Table B.col_match.
```

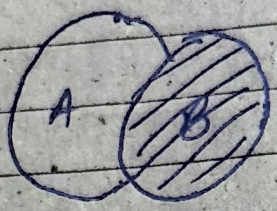



```
Select * from Table A.
Left Outer join Table B
on Table A.col_match = Table B.col_match.
where Table B.Id is null.
```

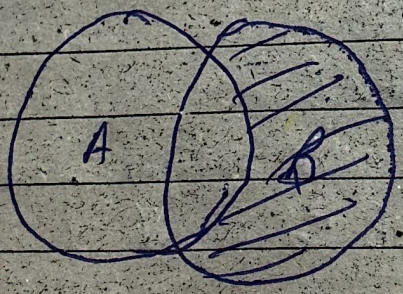


Right join

Same as left join, just the tables are switched.



Select * from Table A
Right join Table B
on Table A. col_match = Table B. col_match.



Select * from Table A
Right join Table B
on Table A. col_match = Table B. col_match
where Table A. id is null.

UNION

union operator concatenate the two
Select statements.

Select * from TableA
UNION
Select * from TableB

Advanced SQL commands

- Timestamps and Extract
- Math functions
- String functions
- Sub-query
- Self-Join

⇒ Timestamp and Extract ⇒ Part One

Time - Contains only time
DATE - Contains only date
TIMESTAMP - Contains date & time
TIMESTAMPZ - Contains date, time and timezone.

functions and operations

Timezone
Now
Timeofday
Current_Time
Current_Date

Select Now()
gives current timestamp

Select Timeofday()
gives time & date

Extract()
Age()
To_char()

Extract()

Allows you to "extract" or obtain a sub-component of a date value.

- year
- month
- day
- week
- Quarter.

Ex:- Extract (year from date_column)

Age()

Calculates and returns the current age given a timestamp.

Usage:
- AGE (date_col)

Returns
- 13 yrs 1 mon 5 days 01:34:13.003423

To_char()

- General function to convert data types to text
- useful for timestamp formatting

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Usage

- To_char (date_col, 'mm-dd-yyyy')

- Mathematical functions and operators.
- String functions & operations } look at pg documentation

SUB QUERY

- A subquery allows you to construct complex queries, essentially performing a query on the results of another query.

- Their syntax is straightforward and involves two SELECT statement.

Ex:- SELECT (Student, Grade from test_scores where Grade > (SELECT AVG (grade) from test_scores))

- A subquery can operate on a seperate table:-

Ex:- Select student, Grade from test_scores where Student IN (select Student from honor_roll_table)

EXISTS

Select col_name
from tab_name
where EXISTS
(select col_name from table_name where condition);

Self-join

- Syntax

Select Table A.col, table B.col
from table A as table A
JOIN table A as table B ON
table A.some_col = table B.other_col

Create Database & Table

- Section Overview

→ Data Types
→ Primary and foreign keys
→ Constraints
→ Create
→ update
→ Insert
→ Delete, alter, drop.

- Understanding about primary & foreign keys.

~~Primary & Foreign keys.~~

→ Data types

1) Boolean
True or false

2) Character
char, varchar, and text

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c) Numeric
integer and floating-point number

d) Temporal
date, time, timestamp, and interval.

e) UUID
Universal Unique identifiers

f) Array
Stores an array of strings, numbers etc

g) JSON.

h) Hstore key-value pair

i) Special types such as network address and geometric data

Primary & foreign Key

i) Primary Key

- A primary key is a column or a group of columns used to identify a row uniquely in a table.
- (A unique + Non null)

ii) Foreign Key

- A table that contains the (f) key is called referencing table.

- A table can have multiple foreign keys depending on its relationship with the other tables.

Constraints

- Rules enforced on data columns on table.
- These are used to prevent invalid data from being entered into the database.
- Ensures the accuracy and reliability of the data in the database.

— Column constraints
— Table constraints.

Common constraint

i) Not Null → Ensures that a column cannot have a null value.
ii) Unique → Ensures all values in a column are different.
iii) Check → Ensures that all values in a column satisfy certain conditions.
iv) Exclusion → Ensures that if any 2 rows are compared on the specified column or expression using the specified operator, not all these comparisons will return TRUE.

Data Type

SERIAL

- A sequence is a special kind of database object that generates a sequence of integers.
- A sequence is often used as a primary key

Column in a table.

Commands to create table

① Create

② Insert

③ Update

update table
Set column 1 = value1,
column 2 = value 2, ...
where
condition;

Ex:- update account_job

Set hire_date = account.created_on.
from account
where account_job.userid = account.user_id.

④ DELETE

Delete from table A
where row_id = 1

or

Delete from table A

6. Alter table

Alter table table_name
Alter Col col_name.
drop default

7. Drop table

8. Check Constraint

Create table example (ex_id SERIAL PRIMARY KEY, age SMALLINT CHECK (age > 21), parent_age SMALLINT CHECK (parent_age > age));

Conditional Expressions

i) CASE
ii) COALESCE
iii) NULLIF
iv) CAST
v) Views
vi) Import & Export functionality

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Two main ways to use a CASE statement, either a general CASE or a CASE expression.

Both methods can lead to same results.

Syntax

When Condition1 Then result1
When Condition2 Then result2
Else some_other_result
END.

CASE

Example:

```
Select a,
CASE when a=1 THEN 'one'
     when a=2 THEN 'two'
     Else 'other' AS label
     END
     from test;
```

The CASE expression syntax.

- CASE Expression.

When value1 Then result1
When value2 Then result2
Else
some_other_result
END
from test;

COALESCE

- The coalesce function accepts unlimited no of arguments. It returns the first argument that is (not null). If all arguments are null, the coalesce function will return null.

- COALESCE (arg-1, arg-2, ... arg-n)

Ex:→ Select coalesce (1, 2)

o 1

Select coalesce (Null, 2, 3)

o 2

CAST

- CAST operator lets you convert one data type to another
- Ex:→ '5' to an integer will work, 'five' to an integer will not.

Syntax:→

- Select CAST ('5' As integer)
- Select '5' :: INTEGER

Null if

The null if function takes in 2 inputs and returns NULL if both are equal, otherwise it returns the first argument passed.

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- NullIf (arg1, arg2)

Example

NullIF (10, 10)

- Returns Null

Views

- A view is a database object that is of a stored query.
- A view can be accessed as a virtual table in PostgreSQL.
- A view does not store data physically, it simply stores the query.

Import & Export files

files :- →