A Basic SQL query would be like :

SELECT * FROM

TABLE_NAME WHERE CONDITION

ORDER BY COLUMN_NAME;

The most commonly used commands are : Select , Insert , Update , Delete , Create , and Drop which can be used to do many operations in database.

Conditional selections used in the where clause:

=	Equal
>	Greater than
<	Less than
>=	Greater than or equal
<=	Less than or equal
<>	Not equal to

Please find few SQL commands below:

SELECT Statement

“SELECT” is a keyword which will select the data which ever you are referring.

Example:

SELECT * from Table1;

Here * denotes all and also we can specify the particular column to SELECT Keyword. Also you can use “DISTINCT” Keyword to fetch unique columns.

WHERE Clause:

“WHERE” Clause is used to filter records.

Example:

SELECT * FROM Table1 where Name=”Rahul”;

The above statement will only display the record containing the Name: Rahul.

Most Commonly used SQL WildCard Characters are : * and ? which means Zero or more characters and single character. If we need to insert multiple values in the WHERE clause then SQL IN Keyword is preferred.

UPDATE Statement:

"UPDATE" Statement is used to modify the existing record in the table.

Example:

UPDATE Table1 Set Location="Chennai" where Name="Rahul";

Here Set is used to change the existing data with the new one based on the condition.

DELETE Statement:

"DELETE" statement is used to delete the existing records in the table.

Example:

DELETE From Table1 where Name="Rahul";

INSERT INTO Statement:

"INSERT INTO" is used to insert new records in the table.

Example:

INSERT INTO Table1 (Name,Location) values("Ravi","Chennai");

We have a way to impose rule to the data in the table which is commonly known as SQL Constraints and the commonly used are

1. NOT NULL (To ensure column doesn't contain null values)
2. UNIQUE (To ensure unique values in a column)
3. Primary Key (Not Null and Uniquely identifies each row in a table)
4. Foreign key(Referring primary key in another table)

Note: A Field with a null value is considered as no value and also NULL Value is different from a Zero or a field that contains spaces.

We have a concept in SQL called Key which means single or combination of multiple fields in a table).

There is a concept called SQL VIEW which refers to a virtual table which contains rows and columns.

We also have SQL Union Operator which is used to combine result set of two or more SELECT statements. There is a difference between Union and Union ALL as Union returns all the values whereas Union ALL returns only the distinct values.

SQL Aliases are used to give a table temporary name and it is used when we are using more than one tables.

We also have a concept called SQL TOP which is used to select how many records to be displayed in the output. Also LIMIT is used to return the limited number of results.

Hope I have covered few topics in SQL which are commonly used to give a glimpse of the course.

SQl Joins

We have a concept of SQL JOIN which is used to combine rows from two or more tables based on common column between the tables.

There are five types of SQL Joins :

1. SQL Inner Join (returns matching values)
2. SQL Left Join (returns all records from the left table and matching records from the right table)
3. SQL Right Join (returns all records from the right table and matching records from the left table)
4. SQL Full Join (returns matched records from left and right table)
5. SQL Self Join (returns data based on the condition and same table is joined with itself)

Inner Join:

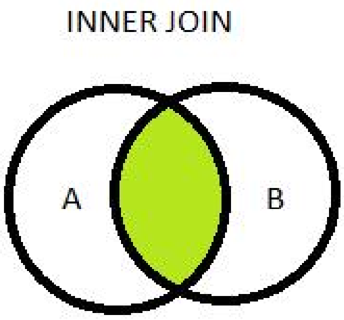
Used to retrieve all records from table A and table B where the join condition is met – retrieves common records from both the tables based on the join condition.

Example:

```
select columns from tableA t1

inner join tableB t2

on t1.col=t2.col;
```



Left Join (Left Outer Join):

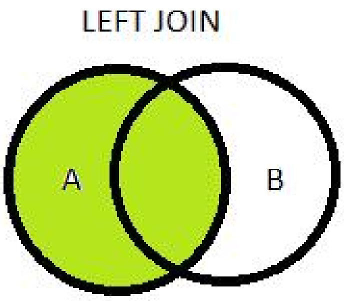
Used to retrieve all records from table A along with records from table B for which the join condition is met – retrieves all table A records, unique columns of table B and appends NULL values to table B columns if values are empty.

Example:

```
select columns from tableA t1

left join tableB t2

on t1.col=t2.col;
```



Right Join (Right Outer Join):

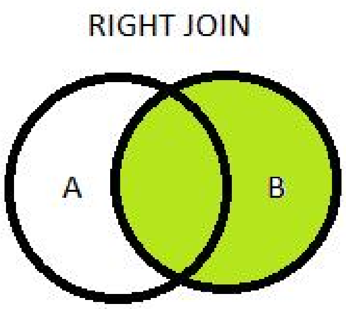
Used to retrieve all records from table B and subsequent records of table A where the join conditions are met.

Example:

```
select columns from tableA t1

right join tableB t2

on t1.col=t2.col;
```



Full Join (Full Outer Join):

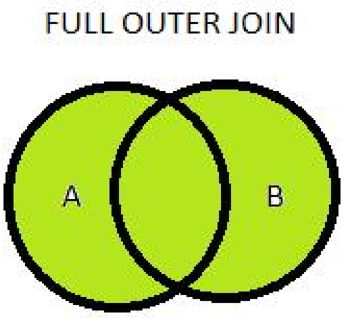
Used to retrieve all records from both the tables including irrespective of the join condition – retrieves all the records even if the join condition is not met

Example:

select columns from tableA t1

full join tableB t2

on t1.col=t2.col;



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SQL- Select Statements

This statement is the most frequently used statement in SQL. This used to fetch the data from the database which we store in a table. We can fetch the complete record of the table either we can apply some condition with a select statement that will be giving result set or record based on the condition.

We can specify the column as well which has to fetch from the table or can fetch all the columns of the table, It completely depends on how you are going to write the syntax for the select statement. If you have applied some rules or conditions on the select statement first it is going to filter the data based on the same and include all the data to be fetched for the respective columns.

The database driver evaluates the select statement as first and last clauses to build the result-set and the same will be shown as the final result.

Syntax – Below is the syntax for the select statement.

If you want to select all the columns from the table.

SELECT * FROM TABLE_NAME;

If you want to select some specified columns from table.

SELECT COL1,COL2,COL3,COL5 FROM TABLE_NAME;

Now let see how this statement works into real-time and how we used to apply rules/condition on the select statement.

SELECT [DISTINCT] , columns [column [AS aliasname]} FROM tableName [alias] [WHERE condition][GROUP BY fieldName(s)][HAVING condition] ORDER BY columnname;

SELECT – This keyword database know that you want to fetch the data.

DISTINCT

This used to get a unique record for the column.

[column AS aliasname] – This can be given for column and table as well. Mostly this is used to remove ambiguity error or to make a short select statement. This can be applied to fetch the different columns from different tables.

WHERE – This is optional and used to apply to put a condition on a column which filters the data while fetching the records.

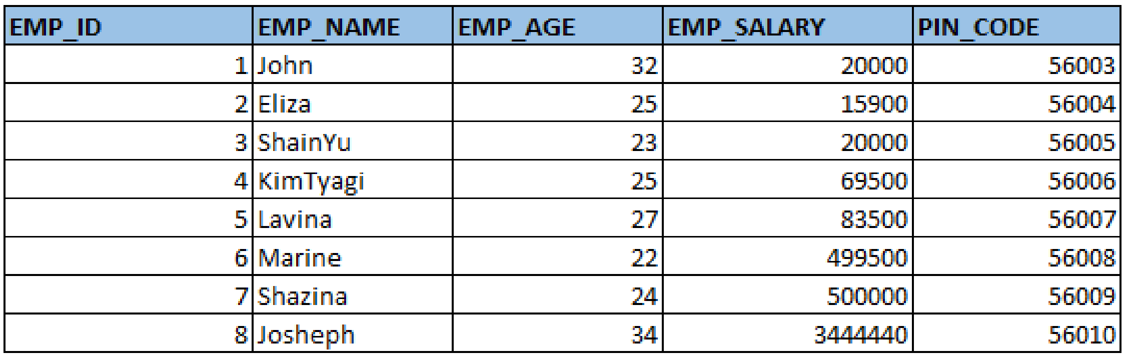
GROUP BY – This is used to show the result-set as a group for the same values in the columns.

HAVING – This is also used to apply criteria and work with GROUP BY

ORDER BY – This is used to apply sorting order on records/result-set

Expressions in SELECT Statement? – Many arithmetic operators can be used with a select statement like division, multiplication, addition, subtraction. If more than one operator is used then it works based on the precedence which used to be done left to right and different based on parentheses along with used multiple operators.

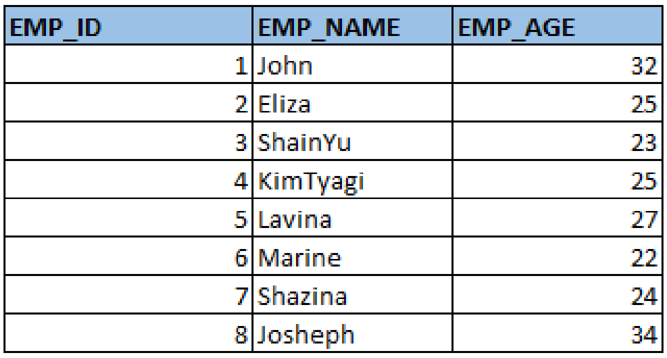
Below is the EMPLOYEE_DETAILS having the following records.



EMP_ID	EMP_NAME	EMP_AGE	EMP_SALARY	PIN_CODE
1	John	32	20000	56003
2	Eliza	25	15900	56004
3	ShainYu	23	20000	56005
4	KimTyagi	25	69500	56006
5	Lavina	27	83500	56007
6	Marine	22	499500	56008
7	Shazina	24	500000	56009
8	Josheph	34	3444440	56010

EMPLOYEE_DETAILS

Let's fetch a few columns – EMP_ID , EMP_NAME,EMP_AGE from the above table.

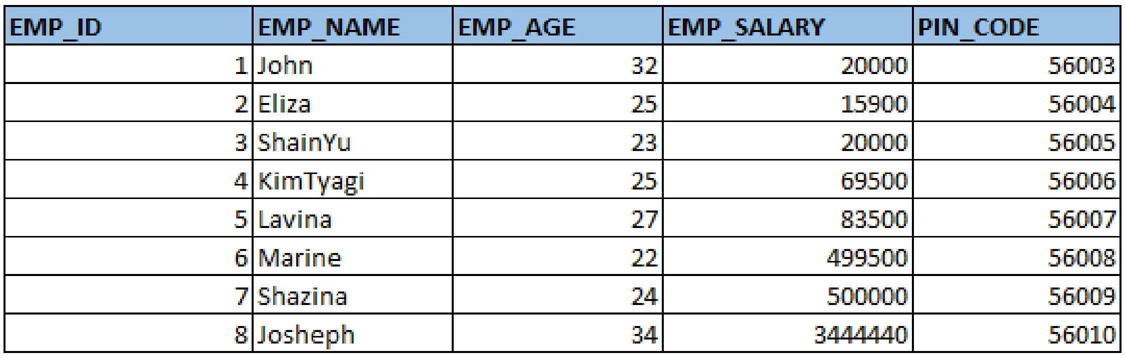


EMP_ID	EMP_NAME	EMP_AGE
1	John	32
2	Eliza	25
3	ShainYu	23
4	KimTyagi	25
5	Lavina	27
6	Marine	22
7	Shazina	24
8	Josheph	34

SELECT EMP_ID,EMP_NAME,EMP_AGE FROM EMPLOYEE_DETAILS;

Let's write the query now to select all the columns, following is the same.

SELECT * FROM EMPLOYEE_DETAILS;



EMP_ID	EMP_NAME	EMP_AGE	EMP_SALARY	PIN_CODE
1	John	32	20000	56003
2	Eliza	25	15900	56004
3	ShainYu	23	20000	56005
4	KimTyagi	25	69500	56006
5	Lavina	27	83500	56007
6	Marine	22	499500	56008
7	Shazina	24	500000	56009
8	Josheph	34	3444440	56010

NESTED SUBQUERY

NESTED queries it is nothing but a query which can return the data to the main query giving more detriments of the retrieving data and we are Where Clause using in embedded queries.

It can be using in the languages DDL,DML for giving the commands Insert, Delete, Update, Select, Truncate using of the Logical operators <,>,<>,= using in the command / Statements in the given data.

SYNTAX:

SELECT column_name

FROM table_name

WHERE column_name [operator]

(SELECT column_name

FROM table_name1, [table_name2]..

WHERE condition)

WHERE:

We are creating the Database, table and fields for giving appropriate data for all the fields.

Consider a table as a student and we are providing the data for oldest database for the student details in the college database and using the query for displaying all the details of the students.

There are majorly two types of nested queries:

Majorly classified into two different types are given below:

Independent Nested Queries

Co-related Nested Queries

Independent Nested Queries:

This query is mainly useful for an independent and executions starts from the innermost and outer query can be executing from the inner query and the operations can be in the different ways likes IN, NOT IN, ANY, CALL, Etc.,

IN:

If we want to find out S_IDwho are enrolled in C_NAME 'DSA' or 'DBMS', we can write it with the help of independent nested query and IN operator. From the COURSE table, we can find out C_ID for C_NAME 'DSA' or DBMS' and we can use these C_IDs for finding S_IDs from STUDENT_COURSE

We can find the values for the STUDENT Table X_ID can be enrolled with X_Name in the DBMS. We can either write or view the tables of the data contents with the help of using the independent query for a IN Query and also using this query in the COURSE Table we can predicting the Y_ID and Y_NAME in the DBMS.

How the steps can be implemented in the Independent Queries are mentioned below:

STEP 1:

Y_ID for Y_NAME =DBMS

Select Y_ID from COURSE where Y_NAME = 'DBMS'

STEP 2:

we can implement the Y_IDusing step 1 for finding the X_ID

Select X_ID from STUDENT where Y_ID IN

(SELECT Y_ID from COURSE where Y_NAME = ’DBMS’);

NOTES:

The inner query will return a set with members Y1 and Y3 and the outer query will return those X_IDs for which Y_IDis equal to any member of the set (C1 and C3 in this case). So, it will return to X1, X2, X3, and X4.

This query will return a set of numbers Y1 and Y4 in the subquery and X1 and X4 in the Nested Query.

NOT IN:

WE can find out the X_ID and X_Name using the Database Table Student are in the DBMS can be done using the query are mention below

Select X_ID from STUDENT where X_ID NOT IN

(Select X_ID from STUDENT_COURSE where Y_ID IN

(SELECT Y_ID from COURSE where Y_NAME’DBMS’));

NOTES:

The inner query will return a set with members Y1 and Y3 and the outer query will return those X_IDs for which Y_IDis equal to any member of the set (C1 and C3 in this case). So, it will return to S1, S2, S3, and S4.

This query will return a set of numbers Y1 and Y4 in the subquery and X1 and X4 in the Nested Query.

Co-related Nested Queries:

This Query can helpful in the nested queries the output can be inner query can be currently executed in the query depending upon the required rows in the table of students and course tables.

Consider the Student Table X_ID and X_Name can exist in the Course Table Y_ID and Y_Name data in the database.

(select * from STUDENT S where S.X_ID=S.X_ID and S.Y_ID=’X1’);

NOTES:

For the entire row we can be using the STUDENT Table we can be providing the data STUDENT where X.X_ID= S.X_IDand S.Y_ID=’Y1’. If for an X_ID from STUDENT S, finally inner query will return the statement is true and corresponding the Student Table X_ID will be the return of output.

SAMPLE DATA – SQL QUERY

SELECT X_ID,X_Name, X_Age,X_Contact Details

FROM STUDENT

WHERE AGE = (SELECT MAX(AGE) FROM STUDENT)

NOTES:

- Using this query but, initially, the subquery will be executed then it will display the data for the entire created fields in the database table student.
- Consider how this query will works before that the subquery AGE is invoked and executed at first and we are giving the data for the age in the student DB table for a student's likewise going on.,

STUDENT TABLE

C_ID	C_NAME
C1	ANGULAR JAVA SCRIPT
C2	Programming PARDIGRAMS
C3	DBMS CONCEPTS
C4	WEB DESIGNING

COURSE TABLE:

Y_ID	Y_NAME
Y1	ANGULAR JAVA SCRIPT
Y2	Programming PARDIGRAMS
Y3	DBMS CONCEPTS
Y4	WEB DESIGNING

S_ID	S_Name	S_Age	S_Contact Details
A1	AJAYKUMAR	25	+91-98407 87895
A2	MARY CHARLES	23	+91-98401 23456
A3	ANDREW MOHANRAJ	22	+91-63867 89562
A4	MERRY KALIDAS	25	+91-78747 57678

Y_ID	Y_NAME
Y1	ANGULAR JAVA SCRIPT

Y4	WEB DESIGNING

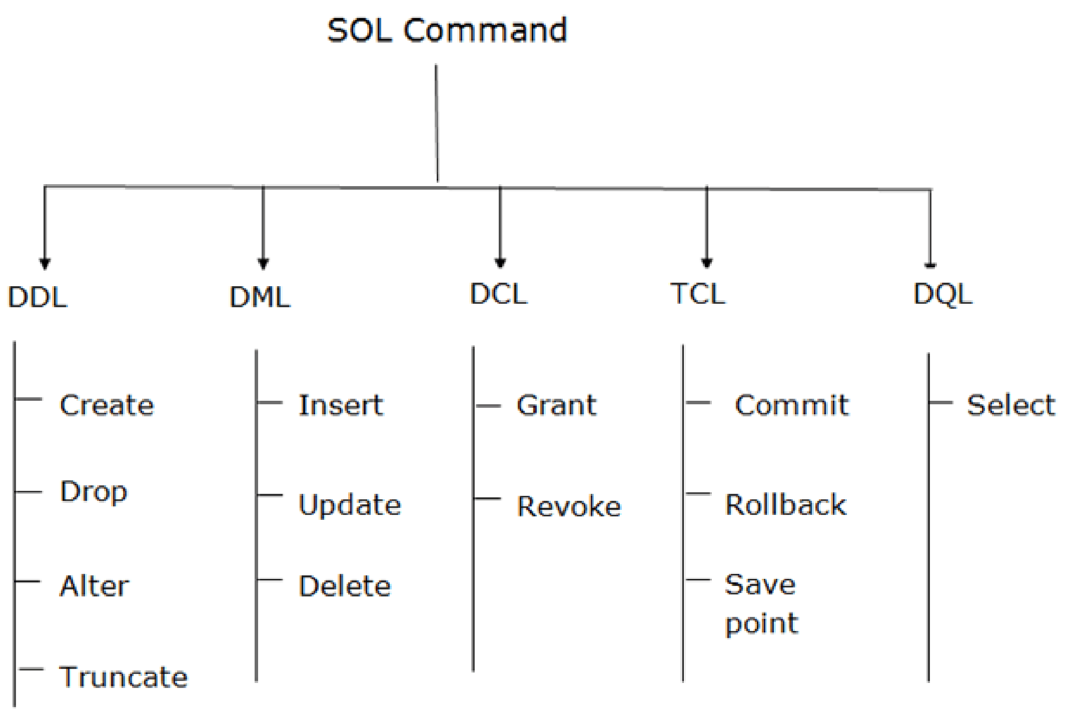
RESULTANT:

STUDENT TABLE and COURSE TABLE

X_ID	X_Name	X_Age	X_Contact Details
X1	AJAY KUMAR	25	+91-98407 87895
A4	MERRY KALIDAS	25	+91-78747 57678

SUBQUERY: AGE for the student table is A1 and A4 is 25 for the given resultant for the above query.

SQL Commands



We are using the sql command four categories:

1.DDL- Data definition Language

2.DML-Data manipulation Language

3.DCL-Data Control Language

4.TCL-Transaction Control Language

1. DDL: (Auto commit)

Abbreviation of DDL is Data Definition language. In sql we are using ddl commands creating the data from schema in your database and deal with the schema object in your database.In that database schema used to create and modify and update in your data.

Here we are using below database DDL commands

Types:

1. CREATE – We are using create command create the database or objects.
2. ALTER – We are using the alter command structure the objects
3. RENAME – We are used the add the comments
4. TRUNCATE – we are using the truncate the command removed the all records
5. DROP – We are using the drop command delete the objects.

CREAT :

It is used to create a new Table in a database (SQL).

CREATE command is a Data Definition Language

CREATE DATABASE command is used to create a new database(schema) in the relational database management system.

CREATE TABLE command is used to create a new table in the existing database.

When we are creating a new table, you can mention the column name and its corresponding datatype. It is optional to mention the Primary key, Foreign Key and constraints for the table.

Example :

```
Create table Sale_order

( SOH_ITEM  VARCHAR2(240),

SOH_QTY    VARCHAR2(240),

SOH_COST VARCHAR2(240)

);

/
```

The Syntax to create new table is

```
CREATE TABLE TABLENAME(column1 dataType, column2 dataType , …………..);
```

Example

Let see an example to create database and table

1. First, we need to create a database as below

SQL>CREATE DATABASE Sample;

Output: Database created

To check whether database has been created , we can use the show databases command .The show databases command will list all the database in the relational database management .

SQL>show databases;

Output:

Databases
Sample

2. **After creating the database, we have to use the database to create the tables inside the database.**

Syntax to use the Database as follows

USE DatabaseName;

To use the sample database , provide the below query.

SQL>use Sample;

3. **Now, we can create the table using the below query , so the table will stored inside the Sample database**

SQL> CREATE TABLE Student(id int, name varchar(30),address varchar(100));

OUTPUT: Table Created

The above command will create a new table with the id, name, and address. Where the column id will store an integer, the name will hold up to 30 characters and address will hold upto 100 characters.

If you are not logged into the database or not giving the use of database command, you can create a table by adding the database name. table name instead of the table name in creating command as below.

SQL> CREATE TABLE Sample.Student(id int, name varchar(30),address varchar(100));

4. **To view the description of the table, you can use the description command as below**

The Syntax for description command

desc table name;

for viewing the description of the table Student, we can use the below query. The desc command shows only the column name, datatype corresponding to the column name and constraints if any.

SQL> desc Student;

OUTPUT:

```
Name      Null      Type

ID                   INT

NAME                VARCHAR2(30)

ADDRESS             VARCHAR2(100)
```

5. **We can use the select command to view all the data along with the column name in the table**

The Syntax for a select statement as below

select * from table name;

For selecting the rows of data from student table, the query as follows

SQL> select * from Student;

Output :

Id	name	Address

6. **Table name should be unique in the database**

SQL>create table Student(id int);

Output: Table or view aleady exists

In the above the , we are creating the table with name Student but tablename is already available in the database, so it does not created the table with same name and shows table or view already exists.

Create a table with a primary key

We can provide the primary key of the column at the time of table creation.

Syntax for creating table with primary key

CREATE TABLE TABLENAME(column1 datatype, column2 datatype,….,PRIMARY KEY(column name));

Example

CREATE TABLE EMPLOYEE(emp_id int,emp_name varchar(20), PRIMARY KEY(id));

Note: Primary Key should always contains the unique value

ALTER:

It is used to Alter the existing data type of a column or Resizing of data type or

Sometimes Renaming of column name , add column and drop column in table

Example :

Alter table sale_order modify SOH_QTY NUMBER;

RENAME :

It is used to Rename of existing Table name in a database , also rename the existing column in a table , modify the data types of existing column.

Example 1 :

Alter table sale_order Rename column SOH_COST to SOH_TOT_COST ;

Example 2 :

Alter table sale_order Rename to Sale_order_details ;

Example 3 :

Alter table sale_order DROP column SOH_COST;

TRUNCATE :

It is used to delete all the data from a table with auto-commit

Truncate is a Data Definition Language command.

Truncate is used to remove all the data or rows from the table. It is mandatory to have ALTER permission on the table to perform the truncate command.

The truncate command is much faster than delete command.

The difference between truncate will only remove all rows and data from the table but drop will remove the entire table from the database.

The major disadvantages of Truncate is, we cannot use the where clause

The Syntax for the truncate command is

TRUNCATE TABLE TABLE_NAME;

Example 1 :

sql plus >select count(*) from sale_order ;

Output:

10 rows selected

Sql plus > Truncate table sale_order ;

Output

Table TEMP1 truncated.

Sql plus > select count(*) from sale_order ;

Output

0 row selected

For Example

TRUNCATE TABLE employee;

Consider the below Student table

Customer_id	Customer_Name	Customer_Phone
105	Ram	7878787878
107	Surya	8988989898

To print the above table we can use the select commands as below.

SQL> select * from Student;

Customer_id	Customer_Name	Customer_Phone
105	Ram	7878787878
107	Surya	8988989898

We can delete all rows of data in the table by using TRUNCATE table command as below

SQL>TRUNCATE table Student;

Now all the data will be deleted from the table and if you give select statement now , it will show only column name because it does not have any data since we performed the truncate command in the table

SQL>select * from Student;

Output:

Customer_id	Customer_Name	Customer_Phone

DROP :

Drop is used to droppingping the entire table with data or some times used to drop the column in a table

DROP is a Data Definition Language command.

DROP is used to remove existing database objects such as database, function, procedure, view, user, and table.

When DROP command used in the table, it removes all rows or data from tables and also removes the table as well as it rows.

DROP table command will remove all the indexes, triggers, privileges, constraints and permission specifications of the table.

It is mandatory to have ALTER permission on the table or database to perform the DROP command

Be careful while dropping the table or table, it is not possible to recover the data after deleting the table or database

In Oracle, if the table is dropped, it will be automatically moved to recycle bin as of Oracle 11 g.

Before deleting the table, it is advisable to delete all the foreign key reference to that particular table.

DROP table command is used to delete the complete table structure from the database

Example 1: Drop table sale_order ;

Table sale_order dropped

Example 1: Alter table sale_order drop column SOH_TOTAL_COST ;

Column SOH_TOTAL_COST dropped

Syntax to drop database

Drop Database DatabaseName;

Example – Drop Database Admin;

Syntax to drop function

Drop Function FunctionName;

Example – Drop Function ADDER;

Syntax to drop procedure

Drop Procedure ProcedureName;

Example – Drop Procedure GET_LINE;

Syntax to drop table

Drop Table TableName;

Example – Drop Database Student;

Consider the below Customer table

Customer_id	Customer_Name	Customer_Phone
105	Ram	7878787878
107	Surya	8988989898

To print the above table we can use the select commands as below,

SQL> select * from Customers;

Customer_id	Customer_Name	Customer_Phone
105	Ram	7878787878
107	Suya	8988989898

We can drop the table by using the DROP table command as below

SQL>Drop table Customer;

Now the table customer will be dropped from the database, if you give select statement now it shows the table or view does not exist.

SQL>select * from Customers;

Output: Table or view does not exists.

Syntax to drop User

Drop User User _Name;

Example – Drop User ADMIN;

Syntax to drop View

Drop View View_Name;

Example – Drop View EMP_VIEW;

Note: Once the table or database is dropped, we could not recover it.

2. DML (Data Manipulation Language):

Abbreviation of DML is Data Manipulation language. In sql we are using DML command manipulation of data and present in the database.

Here most of the command in sql statements.

Type :

1. INSERT – We are used to insert the data from the database
2. UPDATE – We are used to update the data from entire column or particular columns
3. DELETE – We are used to the delete command delete the entire records from the datasets.
4. MERGE – We are used to retrieve data from database.

A transaction consists of a collection of DML statement that form a logical unit of work. A DML statement is executed when the user:

1. Add new rows to a table
2. Modify existing rows in a table
3. Remove existing rows from a table

INSERT:

Inserts new rows into a table. You can insert a single row with the VALUES syntax, multiple rows with the VALUES syntax, or one or more rows defined by the results of a query (INSERT INTO…SELECT).

Syntax with Example:

INSERT INTO table name [(column [, …])]

Values (values [, values.])

Example 1:

Below example shows on how to insert values into empty table when we are aware on the columns available in the table.

insert into category stage values

(12, ‘Concerts’, ‘Comedy’, ‘All stand-up comedy performances’);

Example 2:

If the user wants the create another table like category stage table with the same no of records, then the user can the below method:

Create table table-name as

Select * from category stage

Example 3:

If the user wants to insert only particular records into new table from another table then below method can be used. We can also method column and corresponding value in the insert statement

Insert into category stage

Select id, profession, category from staging

Insert into category stage (id, profession, category)

Values (12, ‘Concerts’, ‘Comedy’);

UPDATE:

UPDATE statement is used to modify existing rows with the update records. A user can update more than one tows at a time (if required).

Syntax:

UPDATE table_name SET column = {expression | DEFAULT} [,…] [FROM fromlist] [WHERE condition]

Example:

Update category stage set profession='Teacher', id=50 where

Name='Allen' and dob='12-12-1994'

DELETE:

If the user wants to delete existing rows one or more then he can use the below method but if the user wants to delete all the rows in the table then he should go for Truncate.

Syntax for Delete and Truncate:

Delete from table-name where condition;

Truncate table table-name

Example:

Delete from staging where parent_id in (201922233,20194566) and source='online'

Truncate table staging

MERGE:

Merge or Upsert is a combination of Both Update and insert in a single SQL statement

Example :

MERGE INTO SALE_ORDER A

USING (SELECT * FROM ITEM_MASTER) B

ON (A.SOH_ITEM = B.ITEM_CODE)

WHEN MATCHED THEN

UPDATE SET (A.SOH_TOTAL_COST = B.COST * A.SOH_QTY

WHEN NOT MATCHED THEN

INSERT INTO ITEM_MASTER (ITEM_CODE,COST) VALUES

(A.SOH_ITEM,(A.SOH_TOTAL_COST/ A.SOH_QTY));

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3. DCL:

DCL is an abbreviation of Data Control Language ,by using this we can give the grant permission such as select ,delete,insert,update and create to schema Users ,Similarly we can also Revoke the given grant access such as select ,delete,insert,update and create from Schema Users. In sql we are used to the DLC data control commands to access the database based on the data.

Types:

- GRANT
- REVOKE

GRANT:

By using GRANT command , we can give the grant permission such as select ,delete,insert,update and create to schema Users in a same DB server. Here we are used to the grant command to access the data from database.

Examples:

1. > Revoke select on sale_order to Ashwath;

(By using this we can Revoke the given granted select access on sale_order(table) from Ashwath (schema user)

> Revoke succeded

2. > Revoke select,insert,update,delete on sale_order to GangBoard;

(By using this we can Revoke the given granted select,insert,update,delete access on sale_order(table) from Ashwath (schema user)

> Revoke succeded

3. > Revoke DBA to GangBoard;

(By using this we we can Revoke the given granted grant all DBA access from the GangBoard (schema user)

> Revoke succeded

REVOKE :

By using REVOKE command , we can Revoke the given granted permission such as select, delete,insert,update and create from a schema Users in a same DB server. Here we are used to the revoke command to revoke the acesss from the database.

1. **>** Revoke select on sale_order to Ashwath;

(By using this we can Revoke the given granted select access on sale_order(table) from Ashwath (schema user)

> Revoke succeded

2. > Revoke select,insert,update,delete on sale_order to GangBoard;

(By using this we can Revoke the given granted select,insert,update,delete access on sale_order(table) from Ashwath (schema user)

> Revoke succeded

3. > Revoke DBA to GangBoard;

(By using this we we can Revoke the given granted grant all DBA access from the GangBoard (schema user)

>Revoke succeded

4. TCL:

TCL is an abbreviation of Transaction control language,by using TCL Commands we can commit the DML Operations like (Update ,Delete and Insert) and also we can rollback the DML operations which has not yet commited and also by using TCL Command we can savepoint the DML operation which is commonly used in Plsql block . In Sql we are using to the TCL commands data with the transaction from the database.

Types

COMMIT – Here we are using the commit commands commits the transactions.
ROLLBACK – Here we are using the rollback commands to rollback the data from the database.
SAVEPOINT – Here we are using the Savepoint to save within the Transactions.
SET TRANSACTIONS – Here we are specify the characterisitic for the data from the Transactions

COMMIT :

By using 'COMMIT' Command we can commit the DML Operations like (Update ,Delete and Insert) Which has already done(DML)

Example :

1. **>**Delete from SALE_ORDER

Where soh_item_code = 'COMPUTER';

1 Rows Deleted
Commit ;
Commit Completed

2. >Update SALE_ORDER set SOH_QTY = 3 , SOH_COST =150000

Where soh_item_code = 'COMPUTER';

1 Rows Updated
Commit ;
Commit Completed

3. >Insert into SALE_ORDER(soh_item_code,soh_qty,soh_cost)

Values('PRINTER','3','31000');

1 Row Inserted
Commit ;
Commit Completed

ROLLBACK:

By using 'ROLLBACK' Command we can rollback the DML operations which has not yet Commited,

Example :

1. **>**Delete from SALE_ORDER

Where soh_item_code = 'COMPUTER';

1 Rows Deleted
Rollback ;
Rollback Completed

2. >Update SALE_ORDER set SOH_QTY = 3 , SOH_COST =150000

Where soh_item_code = 'COMPUTER';

1 Rows Updated
Rollback ;
Rollback Completed

3. >Insert into SALE_ORDER(soh_item_code,soh_qty,soh_cost)

Values('PRINTER','3','31000');

1 Row Inserted
Rollback ;
Rollback Completed

5. DQL (Data Query Langauge):

The SQL SELECT statement returns a result set of records from one or more tables. A SELECT statement retrieves zero or more rows from one or more database tables or database views.

In most applications, SELECT is the most commonly used data query language (DQL) command.

Below is the list of topics which are used under SELECT

Syntax

WITH Clause, SELECT List, FROM Clause, WHERE Clause, GROUP BY Clause, HAVING Clause

UNION, INTERSECT, and EXCEPT, ORDER BY Clause, Join Examples, Subquery Examples

Correlated Subqueries

Example SELECT Query with all the topics included:

Write a query to print Year, Producer,total current year revenue, total Previous year revenue,Revenue difference,Revenue difference percentage from the given data. Tables are given below.

Note: consider current year is 2019 and previous year is 2018

Table_name : Calendar

year	Date

2019	2006-09-17
2019	2006-07-17
2019	2006-06-17
2018	2006-05-16
2018	2006-04-16
2018	2006-03-16
2019	2006-02-17

Table_name: Producer

Advertiser_name	**Item_key**
SUPERMEDIA INC.	794938
HAGERTY INSURANCE	796774
PEPSICO – QUAKER OATS	784384
ADV/T.B.D.	794744
JOHNSON & JOHNSON – J&J	749040
OSRAM SYLVANIA	740333
UNILEVER – UNILEVER	849303

Table_name: Revenue

Rate	**Item_key**	**date**
2004	794938	2006-09-17
4004	796774	2006-07-17
48753	784384	2006-06-17
654	794744	2006-05-16
84329	749040	2006-04-16
7480	740333	2006-03-16
4793	849303	2006-02-17

Sample Output:

Producer	Current year	Previous year	Revenue diff	Revenue diff %
HAGERTY INSURANCE	261345	261345	0	0
UNILEVER –	0	14294	-14294	-100
ADV/T.B.D.	0	810918	-810918	-100

Query: with revenue as (select a.year as Year, b.advertiser_name as Producer, sum(c.rate) as Revenue from calendar a, Producer b, Revenue c where a.date = c.date and b.item_key = c.item_key and

a.year in (extract(year from current_timestamp), extract(year from current_timestamp)-1) group by Year,Producer)

select top 10 cy.year, cy.Producer, cy.Revenue as “Current Year Revenue”, py.Revenue as “Previous Year Revenue”, cy.Revenue – py.Revenue as “Revenue Diff”, ((cy.Revenue – py.Revenue)/py.Revenue) * 100 as “Revenue Diff %”

from revenue py, revenue cy where py.Year = (cy.Year – 1) and

cy.Producer = py.Producer and py.Revenue > 0 order by “Revenue Diff %” asc

The order of execution for SQL Query is

SELECT column, group_function

FROM table

Where [Condition]

Group BY [group by expression]

Having Clause [Group condition]

Order By column;

SQL UPDATE STATEMENT

In generally,we are saving a data,it’s necessary to modify on the data,when we need.

i.e : A database contains a set of data, a update is coming, deletion is coming.so,we have to achieve those manipulations for the following commands.

In,commands generally we are called in Queries in sql.

UPDATE STATEMENT:

UPDATE is a structured query language (SQL) used to change or update values in a table.
Usually has a suffix WHERE to restrict the change to a set of values that meet a specific set of criteria.

Example:

UPDATE Customers

SET ContactName = ‘Alfred’ WHERE CustomerID = 1;

[Su_table responsive=”yes”]

CustomerID	Contactname	City
1	Smith	Australia
2	Allen	UK

[/su_table]
After Update the Query,the contact name Smith changed to Alfred.This is the way of Update Statement we are handling into SQL.

Updating records in Sql:

Example:

Update command for Single Record:

Table name:Employee

No	Name	Place
1	Raja	India
2	Smith	USA
3	George	UK

Example:

We want to update a single record,or a single person data update,we are going to use the below query:

Update Employee Set Place= ‘Malaysia’ where No=1;

Explanation of Above Query:

Employee table update the place Malaysia,Where no=1,Here No 1,belongs to Raja,so the Raja Place is update from India to Malaysia

After execute the query,the table data is below:

Table name:Employee

No	Name	Place
1	Raja	Malaysia2
2	Smith	UK
3	Allen	UK
4	George	India

So,the above scenario, which is explained how to update a single record.In other words,there is a query,which is used to update a multiple records.

UPDATE MULTIPLE RECORDS:

Update Employee Set Name= 'Raja' where Place='UK';

So,whoever belongs to UK,the all person name changed into Raja.

After,the execution of the above query,the output will like this:

S.No	Name	Place
1	Raja	Malaysia
2	Raja	UK
3	Raja	UK
4	George	India

SQL – Order By Command

Order By comment used to sort the output of specified columns either in Ascending or Descending format

Ascending or Descending can be specified by short form ASC/DESC.

On not specifying any of above sorting order the default sorting order would be Ascending.

Sorting can be done column wise and not row wise

Syntax:

SELECT * FROM table_name ORDER BY column_name ASC|DESC

- Table name in the above syntax mentioning the name of the table.
- Column_name is specifying the targeted column name to be sorted.
- EM

Description:

- Sorting will work column wise and it will change all other corresponding values based on targeted column.
- Sorting can be done on existing table or to the newly created field.
- Sorting can be combined with all other Sql comments.

Sample:

Below is the table we going to use for Order by comment.

Table Name : EMP_St

EMP ID	EMP Name	EMP Status
151521	Selvi	A
151515	Kamal	A
151520	Ijaz	A
151522	Selvi	A
151526	Rani	A
151523	Saravanan	A
151512	Sendil	A

- The above table contains employee tables and it is names as EMP_st.
- In the above table EMP ID has not been sorted properly.
- Lets see how the above table changes with order by comment

Scenario 1: (Order by Ascending)

SELECT * FROM EMP_st ORDER BY EMP ID ASC

- Above query will sort the EMP ID column by Ascending order.
- All other columns such as EMP Name & EMP status will be sorted based on Column EMP ID.
- Output will be as below.

Output:

EMP ID	EMP Name	EMP Status
151512	Sendil	A
151515	Kamal	A
151520	Ijaz	A
151521	Selvi	A
151522	Selvi	A
151523	Saravanan	A
151526	Rani	A

Scenario 2: (Order by Descending)

SELECT * FROM EMP_st ORDER BY EMP ID DESC

Above query will sort the EMP ID column by Descending order.

All other columns such as EMP Name & EMP status will be sorted based on Column EMP ID.

The output will be as below.

Output:

EMP ID	EMP Name	EMP Status
151526	Rani	A
151523	Saravanan	A
151522	Selvi	A
151521	Selvi	A
151520	Ijaz	A
151515	Kamal	A
151512	Sendil	A

The third type will give the same output as ascending order and the syntax will be as shown below.

SELECT * FROM EMP_st ORDER BY EMP ID ASC

SQL – Select TOP Command

Select top comments is used to select the number of rows from the table based on the condition specified in the comment

Select top comment can be used to select:

A specific number of Rows.

Percentage of rows from the table.

Rows with the condition.

Syntax:

The syntax will be varied based on the requirement.

A specific number of Rows

SELECT TOP *number column_name(s)*

FROM *table_name*;

Percentage of rows from the table

SELECT TOP *number column_name(s)*

FROM *table_name*;

Rows with condition

SELECT TOP number column_name(s)

FROM *table_name*;

WHERE *condition*;

Description:

Selecting Top/Percentage of rows will give the output with specified number of rows

Conditions can be given for the specified number of rows

Top row comment can be written in two ways one with top and another one with Limit.

Sample:

Below is the table we going to use for Top comment

EMP_CNTRY:

Name	City
Ram	Delhi
Sam	Tamil Nadu
Srini	Delhi
Naresh	Kerala

Scenario 1: (Select by TOP)

```
SELECT TOP 3 * FROM EMP_CNTRY;
```

(OR)

```
SELECT * FROM Customers
LIMIT 3;
```

- Both queries will give same output
- Above query will select top 3 row from the table
- And the output will be shown as below

Name	City
Ram	Delhi
Sam	Tamil Nadu
Srini	Delhi

Scenario 2: (Select by Percentage)

```
SELECT TOP 50 PERCENT * FROM EMP_CNTRY;
```

- The above query will take the percentage of entire table and give the output.
- The output will be as below.

Name	City
Ram	Delhi
Sam	Tamil Nadu

Above table has 4 rows and since mentioned as 50 percent the output will give only 2 rows.

Scenario 3: (Select with Condition)

```
SELECT * FROM EMP_CNTRY
WHERE City ='Delhi'
LIMIT 2;
```

- The above query will take will execute the condition first and then it will pop up the first 3 rows.
- The output will be as below.

Name	City

Ram	Delhi
Srini	Delhi

Explanation of MERGE Statement in SQL:

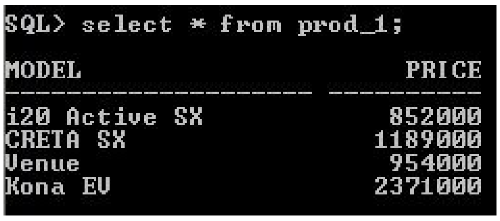
As we discussed before about the MERGE statement in SQL is combination of INSERT, UPDATE and DELETE statements. By using this we can perform all these operations in target table with help of source table data.

Using that, first it will check the matched values from source table, if the value has been matched, then it will perform the operations what we mentioned inside the query, if not matched then it will insert the unmatched record from source table to target table.

Examples:

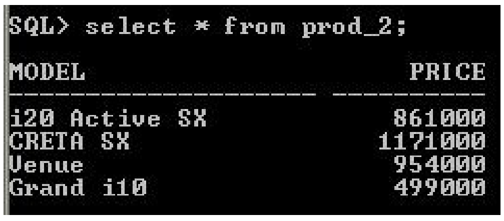
Here we use prod_1 table as source table and prod_2 table as target table. The below example uses prod_2 (target) table to modify the data by getting the data from prod_1 (source) table. Based on the model column's data from both the tables, it can check the price column's data from source table to target table.

Source table: PROD_1



```
SQL> select * from prod_1;

MODEL                     PRICE
-------------------- ----------
i20 Active SX            852000
CRETA SX                1189000
Venue                    954000
Kona EV                 2371000
```

Target table: PROD_2



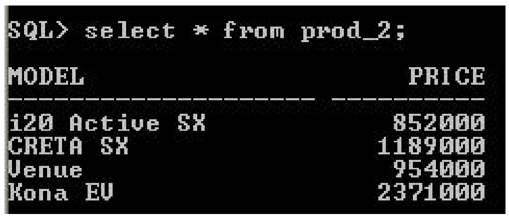
```
SQL> select * from prod_2;

MODEL                     PRICE
-------------------- ----------
i20 Active SX            861000
CRETA SX                1171000
Venue                    954000
Grand i10                499000
```

It will update the data in price column when the data from model column is matched with source table (PROD_1). Otherwise it will insert the record in target table (PROD_2) when the data not available in source table (PROD_1). Delete operation can perform like if the data not available in source table (PROD_1) when the data available in target table (PROD_2), that data can be deleted by using delete statement where I mentioned inside the query.

```
merge into prod_2 p2

using prod_1 p1

//prod_2 is target table and prod_1 is source table

on (p1.model=p2.model)

when matched then

update set p2.price=p1.price

//when record has been matched based on the condition

//it will update the price column from source to target

delete where (p2.model = 'Grand i10')

//if record not exist on source table which is available on taget table

//then the record get delete

when not matched then

//when record not matched on target table, then the record needs to be insert

insert (p2.model, p2.price)

values (p1.model, p1.price);
```

After execution of this query, the price column has been updated in target table using source table data.

RESULT:



```
SQL> select * from prod_2;

MODEL                     PRICE
-------------------- ----------
i20 Active SX            852000
CRETA SX                1189000
Venue                    954000
Kona EV                 2371000
```

This is how we use MERGE statement in SQL. Above I specified the output of the above MERGE statement.

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SQL Merge Statement

Using MERGE statement, we can perform operations like INSERT, UPDATE and DELETE together which is the easiest way to handle the large database and also we need DML(data manipulation privileges) on the target table to execute merge operations.

In simple words, we can update, insert and delete a row conditionally into a table, thus avoiding multiple UPDATE statements. In other words, MERGE Statement in SQL normally merges data from a source record to a target record based on the given condition. The Syntax of the merge statement look differ when compare with other SQL statements.

Consider we have tables like source and target, in that we want to make change in target table with help of source table which consist of updated records. It check the target table from source table like below,

UPDATE:

If the data (used in MERGE condition) from source table is matched with the data from target table, but other than the column is not matched, that columns will be updated from source table to target table.

INSERT:

If the data from source table is not matched with the data from target table, that record will be inserted from source table to target table.

DELETE:

If the data from target table which is not available in source table, that record will be deleted from target table. It means when data not available in source table.

Now we can understand the procedure of MERGE Statement, when to use INSERT, UPDATE and DELETE inside the MERGE statement.

In the Syntax:

USING Clause – specifies the source table where you want to identify the data

ON Clause – specifies the condition between two tables

INTO Clause – specifies the target table where you are updating or inserting or deleting

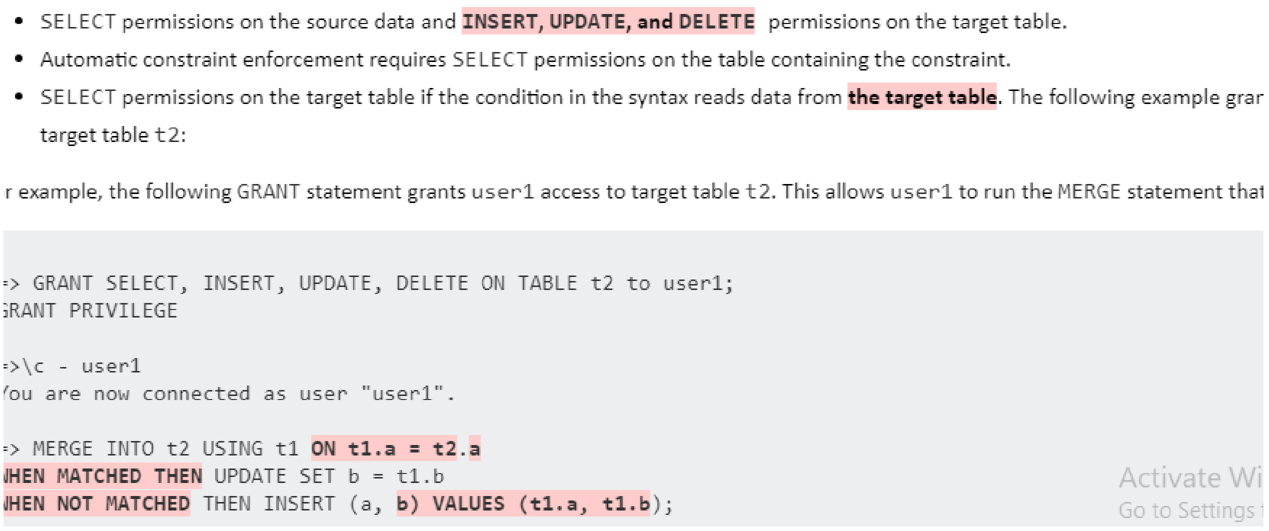
WHEN MATCHED

WHEN NOT MATCHED **–** instruct the SQL server how to perform the results of the join condition

MERGE Statement syntax :

```
Merge target_table t1
// t1 is alias name for target table
using source_table t2
// t2 is alias name for source table
on (t1.a=t2.a)
//fix condition to matching the source column (a) and target column (a)
```

```
when matched then
//if the column has been matched proceed the following condition
update set t2.a=t1.a
when not matched by t1 then
//if the column of target table not matched, then proceed the following condition
insert (t2.a, t2.b) values (t1.a, t1.b)
when not matched by t2 then
//if the column of source table not available, then proceed the following condition
delete;
```



- SELECT permissions on the source data and **INSERT, UPDATE, and DELETE** permissions on the target table.
- Automatic constraint enforcement requires SELECT permissions on the table containing the constraint.
- SELECT permissions on the target table if the condition in the syntax reads data from **the target table**. The following example grar target table t2:

r example, the following GRANT statement grants user1 access to target table t2. This allows user1 to run the MERGE statement that

```
=> GRANT SELECT, INSERT, UPDATE, DELETE ON TABLE t2 to user1;
GRANT PRIVILEGE

=>\c - user1
You are now connected as user "user1".

=> MERGE INTO t2 USING t1 ON t1.a = t2.a
WHEN MATCHED THEN UPDATE SET b = t1.b
WHEN NOT MATCHED THEN INSERT (a, b) VALUES (t1.a, t1.b);
```

USING Clause in SQL

Using clause is specifies a column name which is matched in two tables when performing join operation. It is used in EQUI JOIN where we mentioned it as join condition instead of using ON Clause.

If we use USING Clause in NATURAL join, that kind of join modified as EQUI Because Using Clause and NATURAL Join are mutually exclusive.

It should not have alias name or table name in specified column.

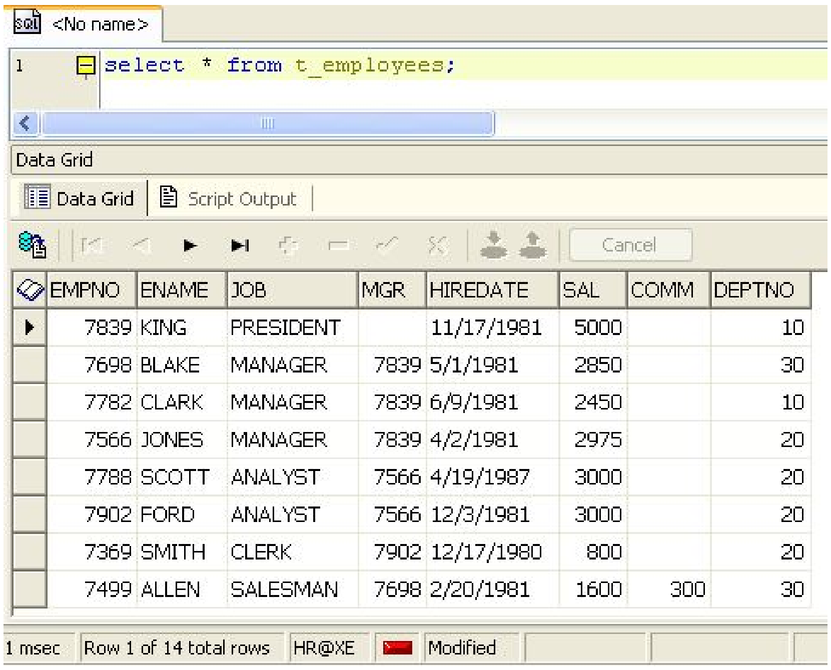
In USING Clause we use only one column to match the record even more than one column matched.

Examples:

The following base tables are used to perform the above join conditions with use of **USING** Clause.

Example 1:

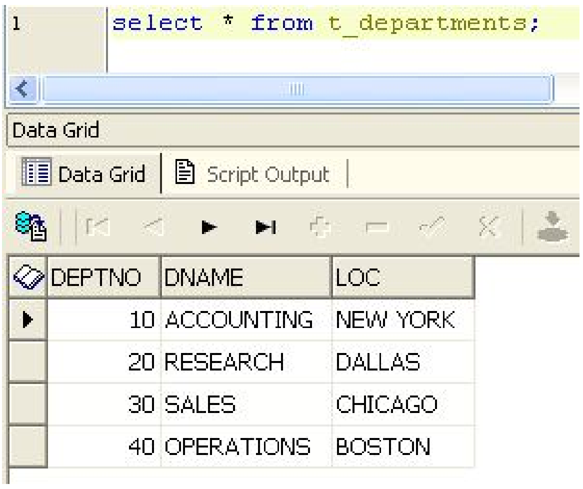
Table name: t_employees



```
select * from t_employees;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7839	KING	PRESIDENT		11/17/1981	5000		10
7698	BLAKE	MANAGER	7839	5/1/1981	2850		30
7782	CLARK	MANAGER	7839	6/9/1981	2450		10
7566	JONES	MANAGER	7839	4/2/1981	2975		20
7788	SCOTT	ANALYST	7566	4/19/1987	3000		20
7902	FORD	ANALYST	7566	12/3/1981	3000		20
7369	SMITH	CLERK	7902	12/17/1980	800		20
7499	ALLEN	SALESMAN	7698	2/20/1981	1600	300	30

Table name: t_departments



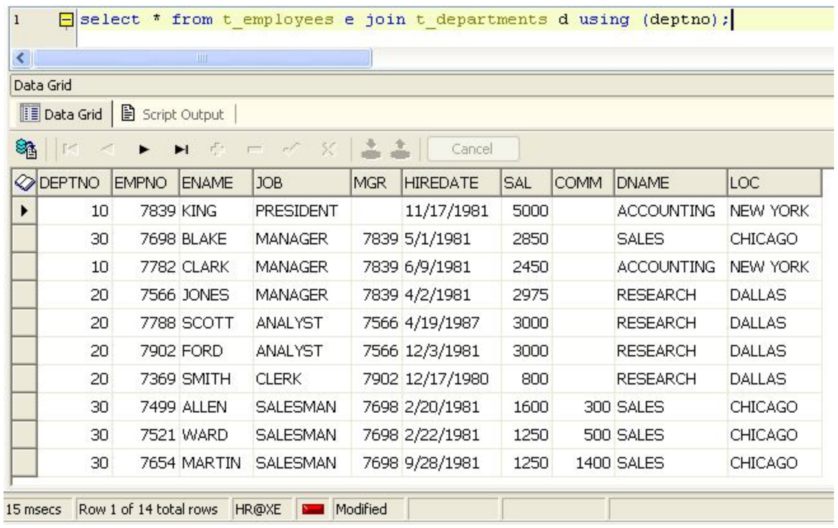
```
select * from t_departments;
```

DEPTNO	DNAME	LOC
10	ACCOUNTING	NEW YORK
20	RESEARCH	DALLAS
30	SALES	CHICAGO
40	OPERATIONS	BOSTON

Requirement 1: Write a query to find department name and location of all employees.

select * from t_employees e join t_departments d using (deptno);

Output:



```
select * from t_employees e join t_departments d using (deptno);
```

DEPTNO	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DNAME	LOC
10	7839	KING	PRESIDENT		11/17/1981	5000		ACCOUNTING	NEW YORK
30	7698	BLAKE	MANAGER	7839	5/1/1981	2850		SALES	CHICAGO
10	7782	CLARK	MANAGER	7839	6/9/1981	2450		ACCOUNTING	NEW YORK
20	7566	JONES	MANAGER	7839	4/2/1981	2975		RESEARCH	DALLAS
20	7788	SCOTT	ANALYST	7566	4/19/1987	3000		RESEARCH	DALLAS
20	7902	FORD	ANALYST	7566	12/3/1981	3000		RESEARCH	DALLAS
20	7369	SMITH	CLERK	7902	12/17/1980	800		RESEARCH	DALLAS
30	7499	ALLEN	SALESMAN	7698	2/20/1981	1600	300	SALES	CHICAGO
30	7521	WARD	SALESMAN	7698	2/22/1981	1250	500	SALES	CHICAGO
30	7654	MARTIN	SALESMAN	7698	9/28/1981	1250	1400	SALES	CHICAGO

15 msecs | Row 1 of 14 total rows | HR@XE | Modified

Explanations:

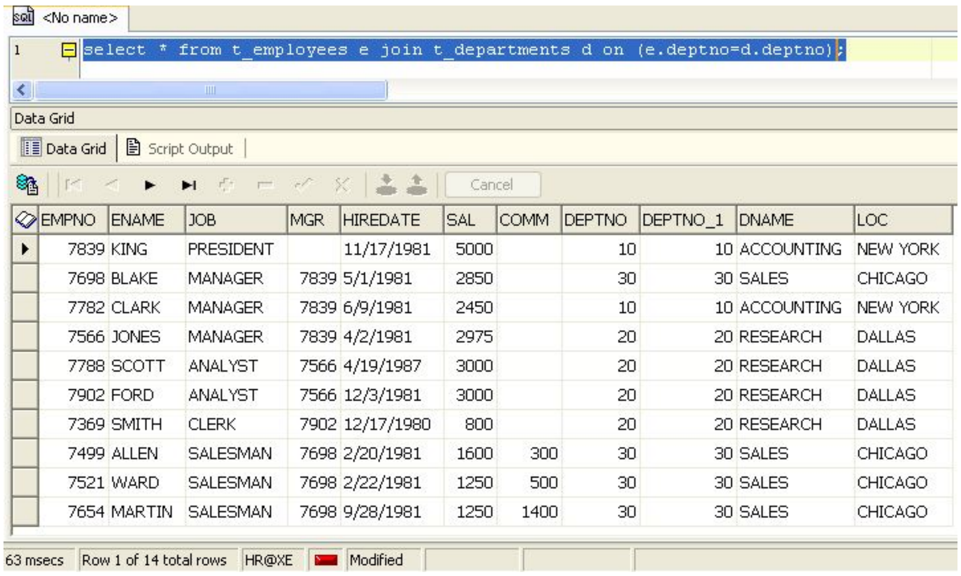
In above example we use USING Clause in DEPTNO column from T_EMPLOYEES and T_DEPARTMENTS to find all employees with their respective department name (DNAME) and locations (LOC).

We can see the same output while using **ON** Clause instead of **USING** Clause. But here we need to mention the equality between two tables.

Alternate Query:

select * from t_employees e join t_departments d on (e.deptno=d.deptno);

Output:



```
select * from t_employees e join t_departments d on (e.deptno=d.deptno);
```

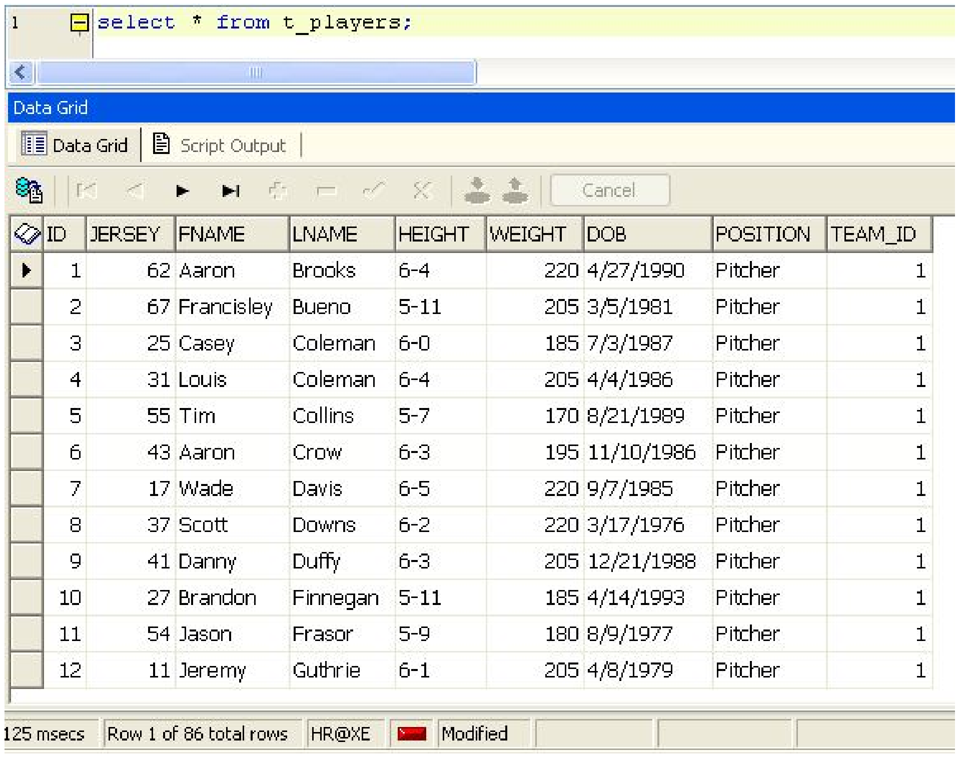
EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO	DEPTNO_1	DNAME	LOC
7839	KING	PRESIDENT		11/17/1981	5000		10	10	ACCOUNTING	NEW YORK
7698	BLAKE	MANAGER	7839	5/1/1981	2850		30	30	SALES	CHICAGO
7782	CLARK	MANAGER	7839	6/9/1981	2450		10	10	ACCOUNTING	NEW YORK
7566	JONES	MANAGER	7839	4/2/1981	2975		20	20	RESEARCH	DALLAS
7788	SCOTT	ANALYST	7566	4/19/1987	3000		20	20	RESEARCH	DALLAS
7902	FORD	ANALYST	7566	12/3/1981	3000		20	20	RESEARCH	DALLAS
7369	SMITH	CLERK	7902	12/17/1980	800		20	20	RESEARCH	DALLAS
7499	ALLEN	SALESMAN	7698	2/20/1981	1600	300	30	30	SALES	CHICAGO
7521	WARD	SALESMAN	7698	2/22/1981	1250	500	30	30	SALES	CHICAGO
7654	MARTIN	SALESMAN	7698	9/28/1981	1250	1400	30	30	SALES	CHICAGO

63 msecs | Row 1 of 14 total rows | HR@XE | Modified

Example 2:

Table Name: t_players

Table Name: t_teams

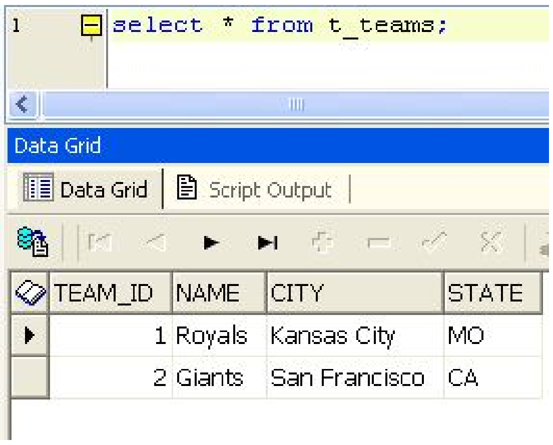


```
select * from t_players;
```

ID	JERSEY	FNAME	LNAME	HEIGHT	WEIGHT	DOB	POSITION	TEAM_ID
1	62	Aaron	Brooks	6-4	220	4/27/1990	Pitcher	1
2	67	Francisley	Bueno	5-11	205	3/5/1981	Pitcher	1
3	25	Casey	Coleman	6-0	185	7/3/1987	Pitcher	1
4	31	Louis	Coleman	6-4	205	4/4/1986	Pitcher	1
5	55	Tim	Collins	5-7	170	8/21/1989	Pitcher	1
6	43	Aaron	Crow	6-3	195	11/10/1986	Pitcher	1
7	17	Wade	Davis	6-5	220	9/7/1985	Pitcher	1
8	37	Scott	Downs	6-2	220	3/17/1976	Pitcher	1
9	41	Danny	Duffy	6-3	205	12/21/1988	Pitcher	1
10	27	Brandon	Finnegan	5-11	185	4/14/1993	Pitcher	1
11	54	Jason	Frasor	5-9	180	8/9/1977	Pitcher	1
12	11	Jeremy	Guthrie	6-1	205	4/8/1979	Pitcher	1

125 msecs | Row 1 of 86 total rows | HR@XE | Modified

Table Name: t_teams



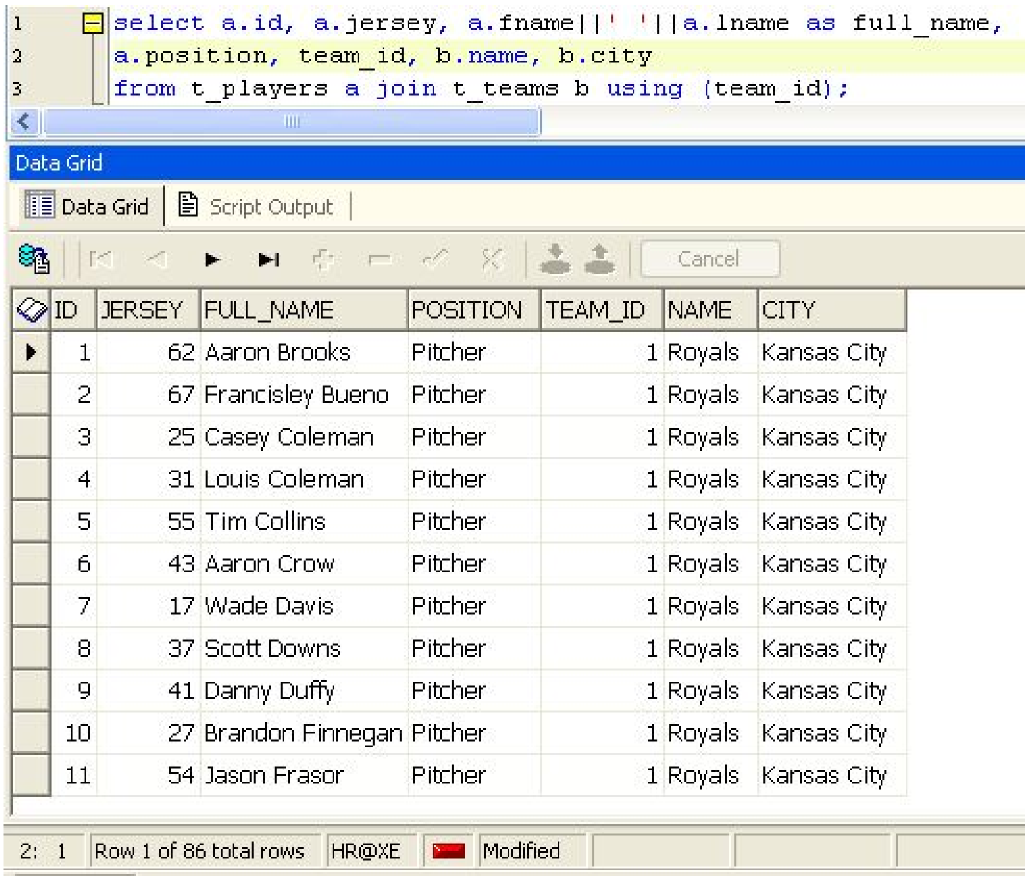
```
select * from t_teams;
```

TEAM_ID	NAME	CITY	STATE
1	Royals	Kansas City	MO
2	Giants	San Francisco	CA

Requirement 2: Write a query to find players id, jersey id, full_name, position and their respective team name and their city.

```
select a.id, a.jersey, a.fname||' '||a.lname as full_name,
a.position, team_id, b.name, b.city
from t_players a join t_teams b using (team_id);
```

Output:



```
select a.id, a.jersey, a.fname||' '||a.lname as full_name,
a.position, team_id, b.name, b.city
from t_players a join t_teams b using (team_id);
```

Data Grid

```
ID JERSEY FULL_NAME         POSITION TEAM_ID NAME   CITY
 1     62 Aaron Brooks      Pitcher        1 Royals Kansas City
 2     67 Francisley Bueno  Pitcher        1 Royals Kansas City
 3     25 Casey Coleman     Pitcher        1 Royals Kansas City
 4     31 Louis Coleman     Pitcher        1 Royals Kansas City
 5     55 Tim Collins       Pitcher        1 Royals Kansas City
 6     43 Aaron Crow        Pitcher        1 Royals Kansas City
 7     17 Wade Davis        Pitcher        1 Royals Kansas City
 8     37 Scott Downs       Pitcher        1 Royals Kansas City
 9     41 Danny Duffy       Pitcher        1 Royals Kansas City
10     27 Brandon Finnegan  Pitcher        1 Royals Kansas City
11     54 Jason Frasor      Pitcher        1 Royals Kansas City

2: 1   Row 1 of 86 total rows   HR@XE   Modified
```

Explanation:

In above example we use USING Clause in TEAM_ID column from T_PLAYERS and T_TEAMS to find all players with their respective team name (NAME) and City name (CITY).

We can see the same output while using ON Clause instead of USING Clause. But here we need to mention the equality between two tables.

Requirement 3: SQL Query to find Second Highest Salary

This query is using to find the 2nd highest Salary in the data set of elements in the data base which Can be determined in the some data sets are using o find the largest salary details using the table employees.

Consider a sample table for finding the 2nd highest salary on the given set of table

EMP_NAME	EMP_SALARY
AMU	15000
RAJU	1789654
GOPU	12000
MALANI	17896

[/sua-table]

How we can finding the data highest salary in the above table RAJU is getting most highest salary than others his salary is 1789654.

Syntax:

In the below syntax clearly understanding how we implemented the query to find out the 2nd highest salary

SELECT name, possible (income) as salary FROM employer

WHERE

We can also the query called nest to finding the highest salary

SELECT name, possible (income) AS income

FROM employees

WHERE income < (SELECT possible (income)

FROM employer);

Sample data – sql query

Alternate way how we can also find out the largest salary in the set of data given below

SELECT name, possible (income) AS income

FROM employer

WHERE income IN

(SELECT income FROM employer MINUS SELECT possible (income)

FROM employer);

SELECT name, possible(income) AS income

FROM employer

WHERE income (SELECT possible(income)

FROM employer);

Resultant:

EMP_NAME	EMP_INCOME
RAJU	1789654

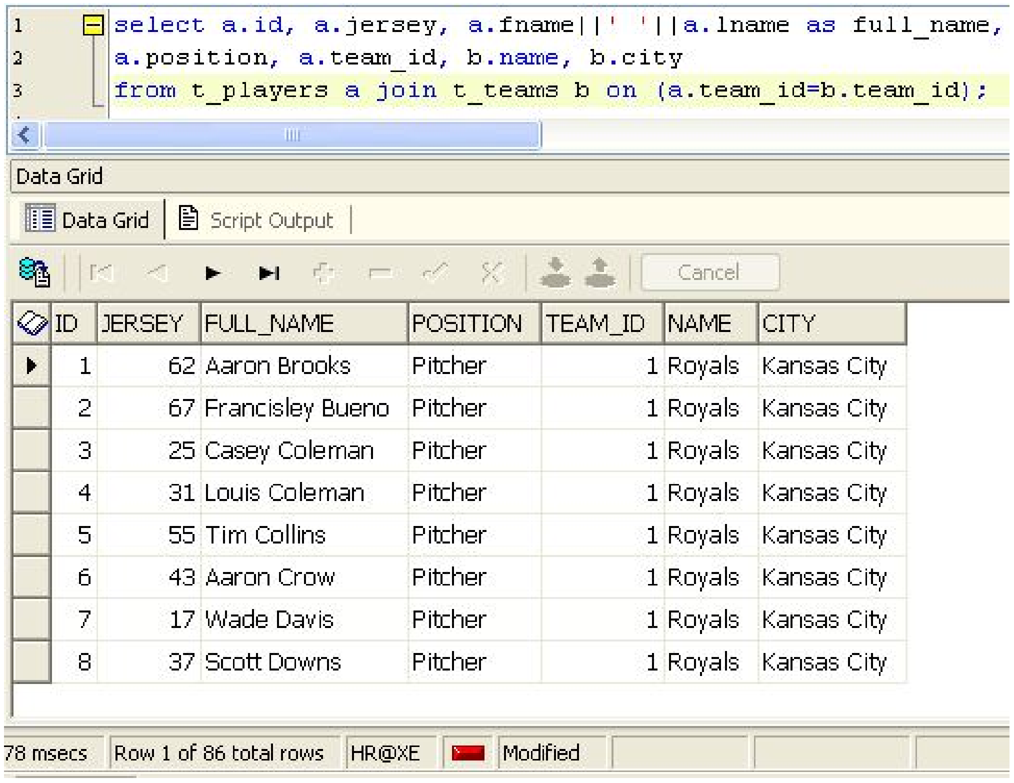
Alternate Query:

select a.id, a.jersey, a.fname||' '||a.lname as full_name,

a.position, a.team_id, b.name, b.city

from t_players a join t_teams b on (a.team_id=b.team_id);

Output:



```
select a.id, a.jersey, a.fname||' '||a.lname as full_name,
a.position, a.team_id, b.name, b.city
from t_players a join t_teams b on (a.team_id=b.team_id);
```

Data Grid

Data Grid | Script Output

ID	JERSEY	FULL_NAME	POSITION	TEAM_ID	NAME	CITY
1	62	Aaron Brooks	Pitcher	1	Royals	Kansas City
2	67	Francisley Bueno	Pitcher	1	Royals	Kansas City
3	25	Casey Coleman	Pitcher	1	Royals	Kansas City
4	31	Louis Coleman	Pitcher	1	Royals	Kansas City
5	55	Tim Collins	Pitcher	1	Royals	Kansas City
6	43	Aaron Crow	Pitcher	1	Royals	Kansas City
7	17	Wade Davis	Pitcher	1	Royals	Kansas City
8	37	Scott Downs	Pitcher	1	Royals	Kansas City

78 msecs | Row 1 of 86 total rows | HR@XE | Modified

Group by Clause in SQL

Is is a SQL Command is used to group the data from the table
It is used in Select statement
By One word about "Group by Clause" is Summarizing Data from the Data Base

GENERAL SYNTAX:

SELECT

FROM

WHERE

GROUP BY

HAVING

ORDER BY

Syntax for group by in a statement

SELECT coloumn_name, functions (coloumn_name)

FROM table_name

WHERE condition

GROUP BY coloumn_name

Roll Number	Name	Age	Height	Weight
101	Abi	21	162	62
102	Bharani	20	172	68
103	Chandhan	19	156	48
104	Dhanush	19	165	68
105	Epsipa	21	156	42

In the above “Student” table , we need Grouped by their Weight by their name and Roll no.

Hence we get the result like below

SELECT Roll Number,Name

FROM Students GROUP By Weight

Result

It will Display Those who are all having same wait that will be shown with their name and Roll No

Roll Number	Name

101	Abi
102	Bharani
104	Dhanush
105	Epsipa

Grouping and aggregate Functions

If we need no of Aggregate Same age people

SELECT ‘Age’, COUNT(‘membership number) FROM ‘students’ GROUP BY ‘Age’:

By executing the above command in MySQL it will gives the Result.

Age	COUNT(‘membership number’)
21	2
20	1
19	2
23	1

Group by in a Statement with Where clause

Considered the below table:

Roll Number	**Name**	**Age**	**Height**	**Weight**
101	Abi	21	162	62
102	Bharani	20	172	68
103	Chandhan	19	156	48
104	Dhanush	24	165	68
105	Epsipa	21	156	42

Query :

list out the Students Name with Hight those who are having above 20years

Syntax

SELECT name, Hight

FROM students

WHERE age>20

Group by Hight

Result:

Roll Number	Name	Height
101	Abi	162
104	Dhanush	165
105	Epsipa	156

Restricting Query Results using the HAVING clause

SELECT coloun1,coloumn2

FROM table1,table2

WHERE [conditions]

GROUP BY coloumn1, column 2

HAVING [conditions]

ORDER BY coloumn1, coloumn2

Examle:

Let consider the table

EMP ID	EMP NAME	AGE	LOCATION	SALARY
1	KUMAR	32	CHENNAI	2000.00
2	MAHESH	25	BANGALORE	1500.00
3	SNEHA	23	KOLKATTA	2000.00
4	RITHESH	27	RAJESTHAN	3850.00
5	KIRAN	32	PUNE	20000.00

QUERY:

Shows the result age count equal to 2 or more than that

SELECT EMP ID,EMP_NAME,AGE,LOCATION,SALARY

FROM CUSTOMERS

GROUP BY age

HAVING COUNT (age) >=2;

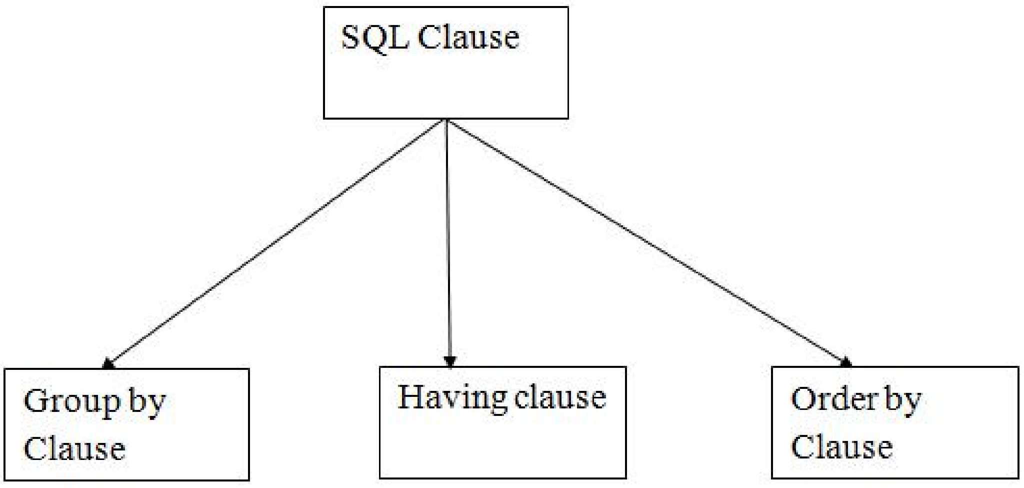
Output:

EMP ID	EMP NAME	AGE	LOCATION	SALARY
1	KUMAR	32	CHENNAI	2000.00
5	KIRAN	32	PUNE	20000.00

SQL Union Clause

The Union Clause is used to join two separate select presentations and produce the result set as a relationship of both the select verbalizations.

- The fields to be used in both the select verbalizations must be in the same mentioning, same number, and same data type.
- The Union revelation produces clear characteristics in the resulting Set, to get the duplicate regards too UNION ALL must be used rather than basically UNION.



SQL Union Clause Basic Syntax

Select * from column_name(s) & tablename1 UNION Select * column_name(s) FROM tablename2; Resultant set consists of distinct values.

Select * from column_name(s) & tablename1 UNION ALL Select * from column_name(s) & tablename2;

Employee

Eid	EM Name	EM Address	EM Phone	Age
101	Mani	Mumbai	xxxxxxxxxx	26
102	Ram	Chennai	xxxxxxxxxx	35
103	Suresh	Salem	xxxxxxxxxx	28
104	Aijay	Delhi	xxxxxxxxxx	40
103	Raj	Pune	xxxxxxxxxx	25
102	Kumar	Gurgon	xxxxxxxxxx	48

Employee Details

Emid	Working	Grade
101	IT	O
102	Mechanical	E
103	Civl	A
104	Electronics	D

Example :

To fetch different Emid from Employee and Employee_Details table.

Select * Emid FROM Employee UNION Select Emid FROM Employee_Details;

Output:

Emid

101

102

103

104

To fetch Emid of Employee and Employee_Details table and including duplicate values. Select * Emid FROM Employee UNION ALL Select Emid FROM Employee_Details;

Output:

Emid

101

102

103

104

103

102

To fetch Emid, EMNAME from the Employee table WHERE Emid is greater than 3 and Emid, Work from Employee_Details table WHERE Emid is less than 3, including duplicate values also definitely filing the data by Emid.

Example

Select * Emid, EM-NAME FROM Employee WHERE Emid>3

UNION ALL

Select * Emid, Work FROM Employee_Details WHERE Emid<3

ORDER BY 1;

The column signs in both those select declarations can infer autonomously save the data type must be that comparable. Additionally, in this result set the sign of the segment done in this at first select announcement will appear.

101	IT
102	Mechanical

104	Aijay

SQL INTERSECT & MINUS CLAUSE

INTERSECT CLAUSE:

The INTERSECT operator is used between two SELECT Statements. It displays the common values from both queries, eliminating duplicate rows and displays data in ascending order. The column which used in the two queries should contain same kind of datatype.

Syntax:

Select column1, column2 from table1

INTERSECT

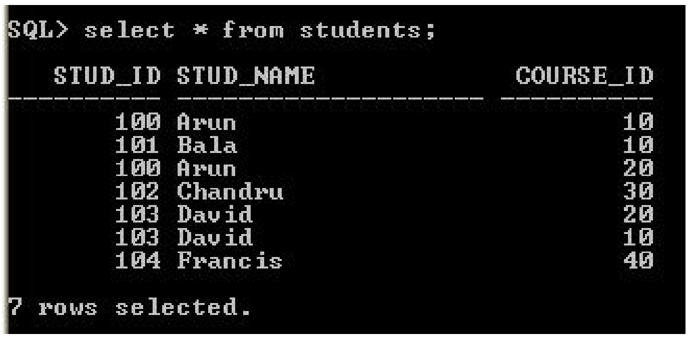
Select column1, column2 from table2;

Here the datatype of column1 and column2 from table1 should match with the datatype of column1 and column2 from table2.

Example:

Table 1: Students

It contain information about the students which their course_id



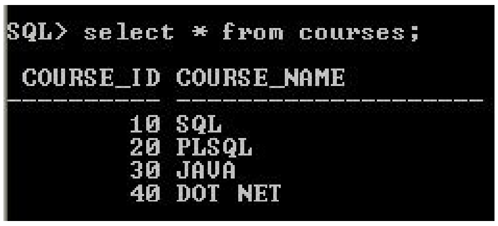
```
SQL> select * from students;

   STUD_ID STUD_NAME             COURSE_ID
---------- -------------------- ----------
       100 Arun                         10
       101 Bala                         10
       100 Arun                         20
       102 Chandru                      30
       103 David                        20
       103 David                        10
       104 Francis                      40

7 rows selected.
```

Table 2: Courses

It contain information about course with their course_id



```
SQL> select * from courses;

 COURSE_ID COURSE_NAME
---------- --------------------
        10 SQL
        20 PLSQL
        30 JAVA
        40 DOT NET
```

Query:

The below query is used to fetch the information about whoever studying both SQL and PLSQL course.

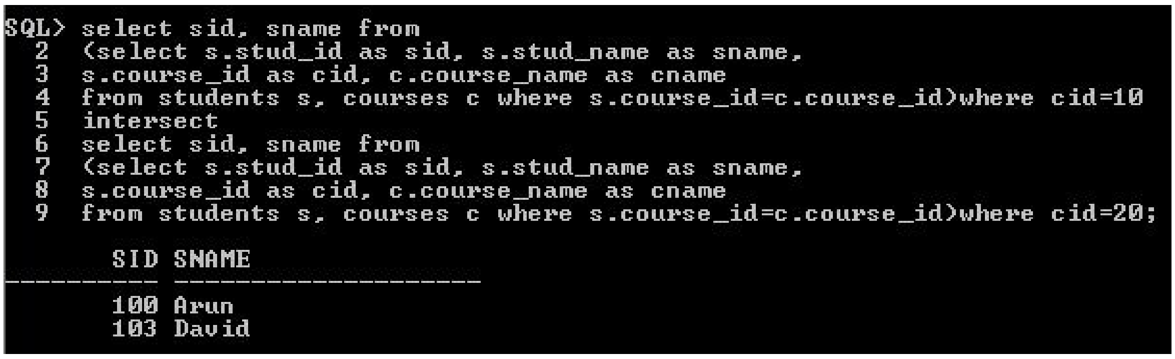
select sid, sname from

(select s.stud_id as sid, s.stud_name as sname, s.course_id as cid, c.course_name as cname from students s, courses c where s.course_id=c.course_id)where cid=10

intersect

select sid, sname from

(select s.stud_id as sid, s.stud_name as sname, s.course_id as cid, c.course_name as cname from students s, courses c where s.course_id=c.course_id)where cid=20;



```
SQL> select sid, sname from
  2  (select s.stud_id as sid, s.stud_name as sname,
  3  s.course_id as cid, c.course_name as cname
  4  from students s, courses c where s.course_id=c.course_id)where cid=10
  5  intersect
  6  select sid, sname from
  7  (select s.stud_id as sid, s.stud_name as sname,
  8  s.course_id as cid, c.course_name as cname
  9  from students s, courses c where s.course_id=c.course_id)where cid=20;

       SID SNAME
---------- --------------------
       100 Arun
       103 David
```

MINUS CLAUSE

The SQL MINUS Clause/Operator is used to return the rows from 1st select statement that is not available in 2ndstatement. It means 1st select statement ignore some record whichever available in 2nd statement. It is opposite to INTERSECT Clause, which shows common records from both queries. But here doesn't show the common records.

Syntax:

Select column1, column2 from table1

MINUS

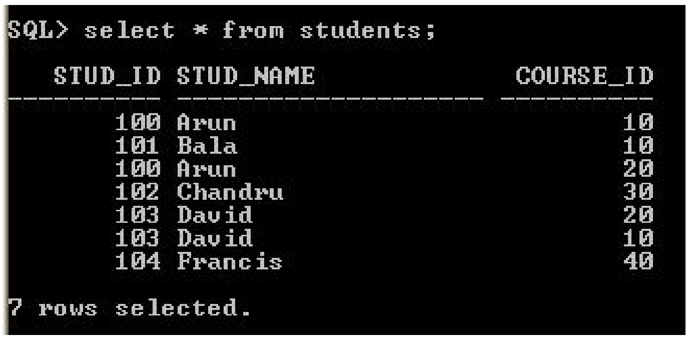
Select column1, column2 from table2;

Here the datatype of column1 and column2 from table1 should match with the datatype of column1 and column2 from table2.

Example:

Table 1: Students

It contain information about the students which their course_id



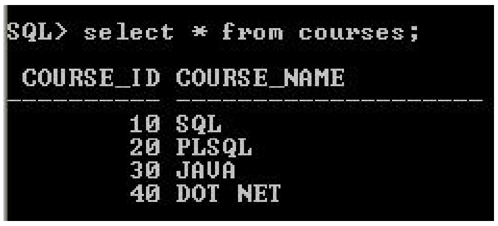
```
SQL> select * from students;

   STUD_ID STUD_NAME             COURSE_ID
---------- -------------------- ----------
       100 Arun                         10
       101 Bala                         10
       100 Arun                         20
       102 Chandru                      30
       103 David                        20
       103 David                        10
       104 Francis                      40

7 rows selected.
```

Table 2: Courses

It contain information about course with their course_id



```
SQL> select * from courses;

 COURSE_ID COURSE_NAME
---------- --------------------
        10 SQL
        20 PLSQL
        30 JAVA
        40 DOT NET
```

Query:

The below query is used to fetch the information about whoever not studying SQL course.

select stud_id, stud_na

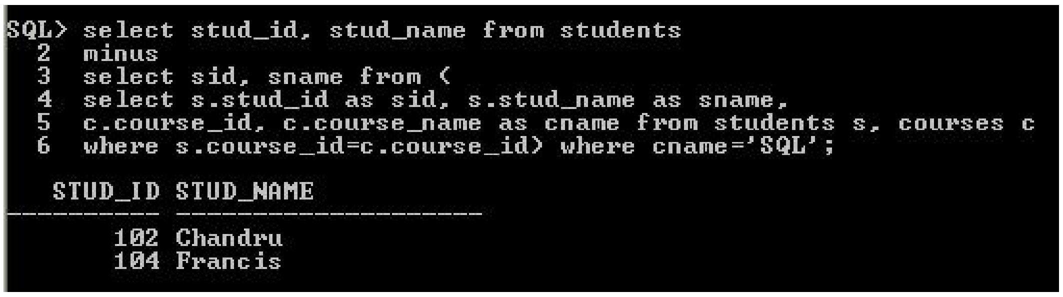
me from students

minus

select sid, sname from (select s.stud_id as sid,

s.stud_name as sname, c.course_id, c.course_name as cname

from students s, courses c where s.course_id=c.course_id) where cname='SQL';



```
SQL> select stud_id, stud_name from students
  2  minus
  3  select sid, sname from (
  4  select s.stud_id as sid, s.stud_name as sname,
  5  c.course_id, c.course_name as cname from students s, courses c
  6  where s.course_id=c.course_id) where cname='SQL';

   STUD_ID STUD_NAME
---------- --------------------
       102 Chandru
       104 Francis
```

SQL View

View:

View is the imaginary table or virtual record set. It contains data at run time only not created in database. The results of using view are not permanently stored in database. View can use in functions, joins and where clause.

- The view will not accept the parameters.
- The view should be a single select query.

The view can UPDATE, DELETE, INSERT the table based on the same scenario which is called updatable view. We will discuss late

Different Ways to Use VIEW:

- Select * from viewname
- Select * from studenmark (Nolock) SM inner join view name VNon VN.sid=SM.sid

Create View:

In SQL a view is a virtual table dependent on the outcome set of a SQL proclamation.

A view contains lines and sections much the same as a genuine table. The fields in a view are fields from at least one genuine tables in the database.

The below-creating view for the student table who is having greater then 18 years

The syntax for Create View:

Syntax-1

Create VIEW view_name AS

SELECT column1, column2,

FROM table_name

WHERE condition;

Syntax-2

CREATE VIEW view_name as select column1, column2…where condition

Example for Create View:

Example-1

CREATE VIEW myViewDemo as

Select id,name from students where stdage>18

Example -2:

The following SQL creates a view that demonstrates all clients from Bangalore:

Create VIEW [Bangalore Customers] AS

SELECT CustomerName, ContactName

FROM Customers

WHERE Country = ” Bangalore “;

SELECT * FROM [Bangalore Customers];

The Following SQL create a view that chooses each item in the “Items” table with a cost higher than the normal cost

Example -3:

Create VIEW [Products Above Average Price] AS

SELECT ProductName, Price

FROM Products

WHERE Price > (SELECT AVG(Price) FROM Products);

We can question the view above as pursues

SELECT * FROM [Products Above Average Price];

Updating View

A view can be refreshed with the CREATE OR REPLACE VIEW direction.

The below SQL view for updating the student table who is having greater than 18 years and less than 50 years

Syntax for Update View:

Syntax-1:

SQL CREATE OR REPLACE VIEW Syntax

Make OR REPLACE VIEW view_name AS

SELECT column1, column2,

FROM table_name

WHERE condition;

Syntax-2:

CREATE OR REPLACE VIEW view_name as select column1, column2…where condition

Example for Update View:

Example-1:

CREATE OR REPLACE VIEW myViewDemo as

Select * from students where stdage>18

Example-2:

The Following SQL includes the “City” segment to the “Bangalore Customers”

Model

Make OR REPLACE VIEW [Brazil Customers] AS

SELECT CustomerName, ContactName, City

FROM Customers

WHERE Country = “Bangalore”;

Deleting View:

A view is erased with the DROP VIEW direction. The view is deleted with the command of DROP.

The syntax for Drop View:

DROP VIEW view_name

Example for Update View:

The Following SQL drops the “Bangalore Customers”

Example-1:

DROP VIEW [Bangalore Customers];

Example-2:

DROP VIEW myViewDemo as

Updatable Views:

- The updatable view can use insert, update, delete based on some rules are
- The view must reference the columns from only one table.
- Should not have the aggregate function (AVG,COUNT,SUM,MIN,MAX)
- Top command is should not have.

Mandatory rules for updating the view:

The view should not have the below

GROUP BY

ORDER BY

DISTINCT

subquery,

join (Means multiple tables),

all, not null values.

With Checkbox Option:

If we create the view using where condition the full table of data will not available in the view. We will get the partial data of the table however a simple view is can updatable whereas it is possible to update the data which is not visible via view when can use the command WITH CHECK OPTION. It will refer only to fetching via view data.

Example:

CREATE OR REPLACE VIEW myViewDemo

As Select * from students where stdage>18 WITH CHECK OPTION

Explanation:

If we didn't use the WITH CHECK OPTION it may happen to (insert, update, delete) less than 18 years students.

SQL Alias

- Expected names are the passing names given to table or section with a definitive target of a specific SQL question. It is utilized when the name of part or table is utilized other than their novel names, in any case, that adjusted name is just
- Pseudonyms made to make table or zone names persistently
- The renaming is only a dupe and table name does not change in the primary
- False names are valuable when table or area names are tremendous or not so much
- These are favored when there is more than one table associated with a solicitation.

Syntax

Select column as alias_name FROM table_name; column: finds the table name

alias_name: Alias name is to use to the temporary replacement of the original column name table_name: to find the table name

For Alias Table Name

Select the Column from the table_name as the alias name Column: fields the data from the table table_name: find the name of the table_name

alias_name: alias table name temporary replacement the table_name

Student_Details		
Student Roll No	**Student Branch Name**	**Student Grade**
1	IT	o
2	ECE	A
3	MECH	o
4	EEE	B
5	CSE	o
6	Arch	C

Queries for determining column alias

To get ROLL_NO from Student table_name using CODE being that alias_name. Select the Roll_No as OfFrom Student_details

Output

1

2

3

4

5

6

To get Branch using Stream as alias name also Grade as CGPA of table Student_Details.

1	IT	o
2	ECE	A

3	MECH	o
4	EEE	B
5	CSE	o
6	Arch	C

Queries for illustrating table alias

Roll.no	**Name**	**Address**	**PhoneNumber**	**Age**
101	Rohit	Chennai	xx xxxxxxx	20
102	kamal	Mumbai	xxxxxxxxxx	18
103	Pradeep	Pune	xxxxxxxxxxx	21
104	Rahul	Vellore	xxxxxxxxxx	18

```
SELECT s.NAME, d.roll FROM Student AS s, Student_Details

AS d WHERE s.Age=20 AND s.ROLL_NO=d.ROLL_NO;
```
Output:

NAME	**Grade**
Kamal	A

SQL Fetch and offset:

Offset and FETCH Clause are used identified with SELECT and ORDER BY stipulation to give an approach to recoup an extent of records.

Bring course is used to return interested number or segments or we can reestablish some degree of whole records and it is used with solicitation by stipulation and not used with itself.

Syntax:

SELECT column_name(R)

FROM table1_name

ORDER BY column1_name

OFFSET rows1_to_skip

FETCH NEXT number_of_rows1 ROWS ONLY;

Example:

Consider that the following Employee table

First Name	Last Name	Employee id	Employee Salary	Super-Employeeid
Ashok	kumar	677368	25000	85662266
Babu	kannan	677369	30000	563333334
Raju	murugan	677370	90000	789654625
Arul	raj	677371	45000	566355553
Mohamed	imran	677372	60000	866663663
Velu	samy	677373	40000	8665225666
Muthu	vel	677374	20000	8966775666

Example 1:

SELECT Firstname, Lastname

FROM Employeeid

ORDER BY EmployeeSalary

OFFSET 2 ROWS

FETCH NEXT 4 ROWS ONLY;

Output:

First Name	Last
Ashok	Kumar
Arul	Raj
Babu	Kannan
Mohamed	imran

Example 2:

Print 2 employeeid details who are at the bottom of the table.

SELECT Firstname, Lastname

FROM Employeeid

ORDER BY EmpoloyeeSalary

OFFSET (SELECT COUNT(*) FROM EMPLOYEE) – 2 ROWS FETCH NEXT 2 ROWS;

Output:

First Name	Lastname
Mohamed	Imran
Raja	murugan

OFEST:

The OFFSET contention is utilized to recognize the beginning stage to return lines from an outcome set. Fundamentally, it bar the principal set of precedent.

Note :

OFFSET must be utilized with ORDER BY condition. It can't be utilized without anyone
OFFSET worth must be more noteworthy than or equivalent to zero. It can't be negative, else return

Syntax:

SELECT column_name(s)

FROM tables_name WHERE condition

ORDER BY column_name

OFFSET rows_to_skip ROWS;

Example 1:

Print Firstname, Lastname of all the Employee except the employee having lowest salary.

SELECT Firstname, Lastname

FROM Employeeid

ORDER BY EmployeeSalary

OFFSET 1 ROWS;

Output:

First Name	Lastname
Muthu	vel
Velu	samy
Mohamed	Imran
Arul	Raj

SQL Date Functions

While working with a database, the configuration of the date in the table must be coordinated with the information date so as to embed. In different situations rather than date, datetime (time is likewise engaged with date) is utilized.

Sysdate :

It returns servers subtleties like date and time. When working with any database, the date format in the table should be matched along with the user data(input data) to insert it to the table. To achieve that some of the date function will be used are listed below.

Below are the date functions that are used in SQL:

LOCALTIME(): It will return the today's date and time.

Syntax: SELECT LOCALTIME() FROM DUAL;

Output: 2019-02-19 02:56:42

LOCALTIMESTAMP(): It will returns the todays date and time.

Syntax: SELECT LOCALTIMESTAMP() FROM DUAL;

Output: 2019-02-19 02:56:48

ADDDATE(): It will returns a date after a certain date interval added to the given data.

Syntax: SELECT ADDDATE("2012-02-19 02:30:47", "5") FROM DUAL;

Output: 2012-02-19 02:30:52

ADDTIME(): It will returns a date time after certain time interval has been added.

Syntax: SELECT ADDTIME("2017-12-15 09:34:21", "2") FROM DUAL;

Output: 2017-12-15 09:34:23

CURDATE(): It will returns the todays date.

Syntax: SELECT CURDATE()FROM DUAL;

Output: 2019-02-19

CURRENT_DATE(): Its returns the todays date with out time.

Syntax: SELECT CURRENT_DATE() FROM DUAL;

Output: 2019-02-19

CURRENT_TIME(): It will returns the current time with out any date

Syntax: SELECT CURRENT_TIME() FROM DUAL;

Output: 02:53:15

CURRENT_TIMESTAMP(): It will returns the todays date and time.

Syntax: SELECT CURRENT_TIMESTAMP() FROM DUAL;

Output: 2019-02-19 02:53:21

CURTIME(): It will returns the current time.

Syntax: SELECT CURTIME() FROM DUAL;

Output: 02:53:28

MAKETIME(): It will returns the time for a certain hour, minute, second combination.

Syntax: SELECT MAKETIME(01, 56, 4) FROM DUAL;

Output: 01:56:04

DATE_ADD(): It will returns a date after a certain date interval has been added.

Syntax: SELECT DATE_ADD(“2019-02-19”, INTERVAL 10 DAY) FROM DUAL;

Output: 2019-02-19

DATE_FORMAT(): It will formats a date as specified by a format mask.

Syntax: SELECT DATE_FORMAT(“2019-12-15”, “%Y”) FROM DUAL;

Output: 2019

DAY(): It will returns the day portion of a date value.

Syntax: SELECT DAY(“2019-02-19”) FROM DUAL;

Output: 16

DAYNAME(): It will returns the weekday name for a date.

Syntax: SELECT DAYNAME(‘2008-05-15’) FROM DUAL;

Output: Thursday

DATE(): It will extracts the date value from the date or date time expression.

Syntax: SELECT DATE(“2017-12-15”) FROM DUAL;

Output: 2017-12-15

DATEDIFF(): It will returns the difference in days between two date values.

Syntax: SELECT DATEDIFF(“2017-12-25”, “2017-12-15”) FROM DUAL;

Output: 10

EXTRACT(): It will extracts parts from a date.

Syntax: SELECT EXTRACT(MONTH FROM “2019-02-19”) FROM DUAL;

Output: 7

HOUR(): It will returns the hour portion of a date value.

Syntax: SELECT HOUR(“2019-02-19 09:34:00”) FROM DUAL;

Output: 9

LAST_DAY(): It will returns the last day of the month for a given date.

Syntax: SELECT LAST_DAY('2019-02-19') FROM DUAL;

Output: 2019-02-31

DAYOFMONTH(): It will returns the day portion of a date value.

Syntax: SELECT DAYOFMONTH('2019-02-19') FROM DUAL;

Output: 16

DAYWEEK(): It will returns the weekday index for a date value.

Syntax: SELECT WEEKDAY("2019-02-19") FROM DUAL;

Output: 0

DAYOFYEAR(): will It returns the day of the year for a date value.

Syntax: SELECT DAYOFYEAR("2019-02-19") FROM DUAL;

Output: 197

SQL Character Function:

Character functions used to accept input data or Colum from a table and apply different transformation to the data which will be resulted in string or number as output.

LOWER: Used to converts alpha character values to lowercase. Also, it will not convert any special characters like $, % etc.

Syntax: LOWER ()

Input: SELECT LOWER('BESANT') FROM DUAL;

Output: besant

UPPER Used to converts alpha character values to uppercase. Also it will not convert any special characters like $,% etc

Syntax: UPPER()

Input: SELECT UPPER('besant') FROM DUAL;

Output: BESANT

INITCAP: Used to converts alpha character values to upper case for each first character.

Syntax: INITCAP()

Input: SELECT INITCAP('besant tech') FROM DUAL;

Output: Besant Tech

CONCAT: used to merge to string into one. Example "abc" & "def"will be merge like "abcdef"

CONCAT('Str1', 'Str2')

Input: SELECT CONCAT('besant' ,'tech') FROM DUAL;

Output: besanttech

LENGTH: used to find the length of the data.

Syntax: LENGTH(Column)

Input: SELECT LENGTH('Lteching Is Fun') FROM DUAL;

Output: 15

SUBSTR: used to return a part of a string from a given starting position.

Syntax: SUBSTR ('String', index, length of string to extract)

Input: SELECT SUBSTR('Database Management System', 9,7) FROM DUAL;

Output: Managem

LPAD and RPAD:used to return the str with data appended left or right of giving string

Syntax: LPAD(Column, n, 'String')

Syntax: RPAD(Column, n, 'String')

Input: SELECT LPAD('500′,5,'#') FROM DUAL;

Output: ##500

Input: SELECT RPAD('10000′,7,'#') FROM DUAL;

Output: 10000##

- **TRIM:** Used to trim the leading or trailing or both the spaces of a given string or column.

Syntax: TRIM(Lead|Trail|Both, trim_char FROM source)

Input: SELECT TRIM('   besant   ') FROM DUAL;

Output: besant

- **REPLACE:** Used to replace a string in a given string. Example: If you want to replace a word "NEW" with another word "Besant" then we can use this function to achieve so.

Syntax: REPLACE(Text, search_str, replace_str)

Input: SELECT REPLACE('NEW TECH', 'NEW','BESANT') FROM DUAL;

Output: BESANT TECH

Input: SELECT REPLACE('abcefabcaaabbbcccabcd', 'abc') FROM DUAL;

Output: efaaabbbcccd

SQL Conditional Expressions

There is 2 type of oracle SQL conditional expression we have.

- CASE
- DECODE

CASE:-

This function is used to decode the values

- Oracle 8.0 introduces the case statement whereas oracle 8i introduces the case conditional statement.
- Case conditional statement is also called a searched case statement.
- Case statement performance is very high compared to the decode function.

Note:- Decode conversion function internally uses equality operator were as case statements we can use all sql operator explicitly

- **CASE Expression:** works in the concept of IF-THEN-ELSE statements. When the expression in true is true it returns the then expression.

Syntax:

CASE expr WHEN expr1 THEN return_expression1

[WHEN expr2 THEN return_expression2

WHEN exprn THEN return_expressionn

ELSE else_expr]

END

Example:

Input:

SELEC

CASE 50 WHEN 50 THEN 1.5*500

WHEN 12 THEN 2.0*500

ELSE 500

END "COLUMN"

FROM DUAL;

Output : 750

The DECODE Function: it is similar to case statement. works in the concept of IF-THEN-ELSE statements. When the expression in true is true it returns the then expression.

Syntax: DECODE(expression , search1 , result1 [, search2 , result2]… [, default])

Input :

SELECT DECODE(50, 50, 1.5*500, , 12, 2.0*500,

500) AS "COLUMN NAME"

FROM DUAL;

Output : 75

GREATEST: Return the largest ASCII value from given list of value/expression

Syntax:

GREATEST(expr1, expr2 [, …..])

Input: SELECT GREATEST(‘ABC’, ‘abc’) from dual;

Output:

GREATEST(‘ABC’, ‘abc’)

ABC

IFNULL: If expression1 is not NULL, returns expression1; otherwise it returns expression

Syntax: IFNULL(expr1, expr2)

Input: SELECT IFNULL(1,0) FROM dual;

Output: 1

Input: SELECT IFNULL(NULL,10) FROM dual;

Output: 10

IN: Is used in where condition to check any one of the value is present in given list of values..

Syntax: WHERE column IN (x1, x2, x3 [,……])

Input: SELECT * FROM TABLE WHERE ID IN(50, 12);

Output: IN(50,20)

LEAST: Return the smallest ASCII value from given list of value/expression.

Syntax: LEAST(expr1, expr2 [, ……])

Input: SELECT LEAST(‘ABC’, ‘abc’)from dual;

Output:

LEAST('ABC', 'abc')

ABC

Input: SELECT LEAST('ABC', null, 'abc') from dual;

Output: LEAST('ABC', null, 'abc')

- **NULLIF:** Returns as a ll value if the e of 1=2, otherwise it returns as value1.

Syntax:NULLIF(1, 2)

Example:

Input: SELECT NULLIF(1122334455, 1122334455) from dual;

Output: NULL

SQL Injection:

SQL injection technique is used to exploit user information via web forms inputs by injecting SQL code as parameter. These data will be further used for manipulate user details or hacking their accounts.

- SQL injection technique is a code injection that might delete your database.
- SQL injection technique is a web hacking technique.
- SQL injection technique is a malicious code in SQL statements.

Web servers communicate with database when they need to retrieve or insert data into database. Attacker's SQL Statements are designed in the manner to executed while the web-server is fetching data from the application server

SQL Injection Example

Suppose we have an app based on employee records. Any employee can view only his or her own records by entering a unique employee ID

Employee id:

And the employee enters the following in the input field:

568483 or 1=1.

So, this basically translates to:

select * from employee where emp_id = 568483 or 1 = 1

Now this **1=1** will remains true without filter any data. Now the hacker has more chance to delete these records from database in similar manner.

Following SQL Statement.

Select * from USER_TABLE where UNAME = “” and PWORD=””

Now the malicious can use the ‘=’ operator to fetch private and secure user details like passwords, Username etc. So instead of the above query the following query when executed, it fetches all the protected data, which are not intended to be shown to the end users.

Select * from USER_TABLE where (UNAME = “” or 1=1) AND (PWORD=”” or 1=1).

SQL Injection Impact

The hacker can fetch all the user details from in the database, such as credit card numbers, Aadhar Card numbers and can also got access to user’s administrator portal. Also, possible to delete the data from the tables.

How to Prevent an SQL Injection

- The way to prevent SQL Injection attacks is the validating input and parametrized queries.
- The application should never use the input directly. The developer must be clean all input, not only web form the inputs also as login forms.
- Must remove potential malicious code such as a single quotes. And turn off the perceptibility of the database errors on your manufacture sites.
- Database errors an might be used with SQL Injection to extract database information.

Mitigation Of SQL Injection Attack Using Prepared Statements (Parameterized Queries):

We explaining the article using SQL Injection attack an exploiting the vulnerability SQL statements into the fields of data which can be executing the data in the fields and it was developed and implemented the year 1998 and still we use the SQL injection attacks. When it is working attacks with DDOS and XSS and DNS hijacking we can use and access the large no of data sets scales.

We explaining the article using SQL Injection attack an exploiting the vulnerability SQL statements into the fields of data which can be executing the data in the fields and it was developed and implemented the year 1998 and still we use the SQL injection attacks. When it is working attacks with DDOS and XSS and DNS hijacking we can use and access the large no of data sets scales.

TERMINOLOGY:

There are two types of terminology

validation

sanitization

Validation: It is nothing a type of validating process for checking the input sets in the given data criteria

Sanitization: It is another type of validating the data sets which can be modifying the inputs that ensure the process is valid and we need to avoid all inputs which can be concatenated in the dynamic data are be sanitized the SQL data to be a correct manner.

Anatomy of an SQL attack:

This can be classified into two types.

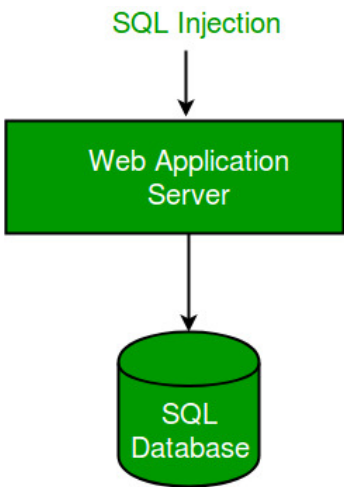
Research

Attack

Research: These methods are mainly for user-end applications process which can be determined by the view the vulnerable data connected the data with the database.

Attack: It is nothing but the malicious fields that can be using the query morph for its own advantages.

Diagramatic Representation:



SAMPLE DATA – SQL QUERY

Find the following data using the piece code an authentication form but it was done in the JAVA Code

Coding

```
filter_none
```

```
Edit

Play_arrow

Brightness_4
```

JAVA CODING

String query = “SELECT Emp_Name, Stock FROM the financial record”

+ “WHERE Emp_Name =” + request.getparameter(“Emp_Name “) +

“and pass_word_protect='” + request.getparameter(“Pass_word_protect”) + “‘”;

Try

{

Statement = connection.createstatement();

Resultset rs = statement.executequery(query);

While (rs.next())

{

Page.addtablerow(rs.getstring(“Emp_Name “),

Rs.getfloat(“Estimate”));

}

}

Catch (sqlexception e)

{}

Using SQL Injection attack we can exploit using the user name and password fields can be generating the TRUE or FALSE (Boolean Expressions), this expression can evaluate the either true or false for considering the fields name and password.

Emp_Name = 1' or '1' = '1

Pass_word_protect = 1' or '1' = '1

The SQL statement then becomes

SELECT Emp_Name, estimate

FROM financial statements

WHERE Emp_Name ='1' OR '1'='1′ and

Pass_word_protect='1′ OR '1'='1′

Using the above query will returning the value that can be using condition (OR 1=1) is true for every statement. This system can be authenticated user can not know with the credentials (Username and Password)

This statement is proved using the command vulnerability that can be prepared statements mitigated can be parameterized queries can be processed.

RESULTANT:

CODING OUTPUT:

Filter_none
Edit
Play_arrow
Brightness_4

```
String query = "SELECT Emp_Name, balance "+
"FROM estimated WHERE emp_name = ?
And pass_word_protect = ?";

Try {
Preparedstatement statement = connection.preparestatement(query);
Statement.setint(1, request.getparameter("Emp_name"));
Resultset rs = statement.executequery();
While (rs.next())
{
Page.addtablerow(rs.getstring("username"),
Rs.getfloat("balance"));
}
```

} catch (sqlexception e)

{ … }

LISTAGG Functions

LISTAGG function in DBMS is used to aggregate strings from data in columns in a database table and an analytical function used to list all column values into a single row and listed. Introduced in oracle 11 g Release 2, making it very easy to perform string aggregation. Only some of the scenarios where we can use this function.

LISTAGG (measure_expr [, 'delimiter']) WITHIN GROUP

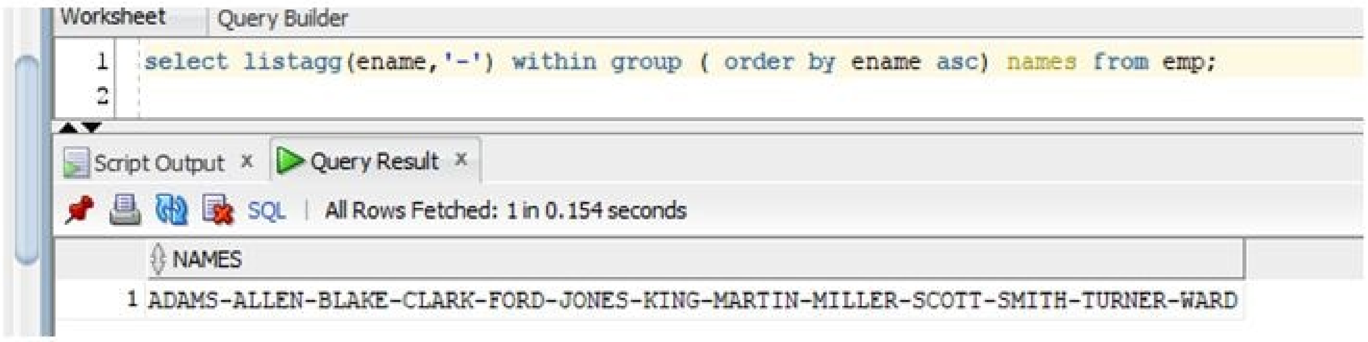
(order_by_clause) [OVER query_partition_clause]

measure_expr : The column or expression to concatenate the values.

delimiter : Character in between each measure_expr, which is by default a comma (,)

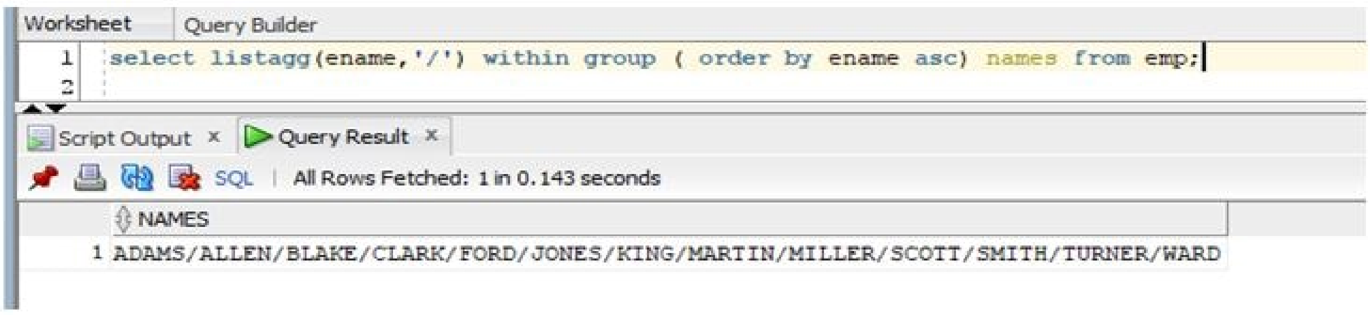
order_by_clause : Order of the concatenated values

Scenario 1: **List all employee names in a single row.**



```
select listagg(ename,'-') within group ( order by ename asc) names from emp;
```

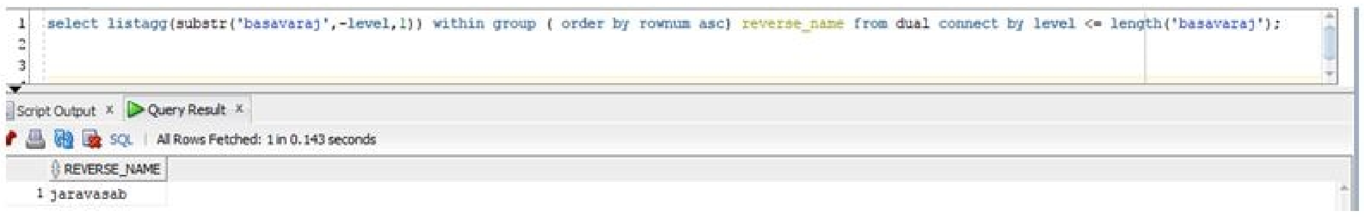
```
  NAMES
1 ADAMS-ALLEN-BLAKE-CLARK-FORD-JONES-KING-MARTIN-MILLER-SCOTT-SMITH-TURNER-WARD
```



```
select listagg(ename,'/') within group ( order by ename asc) names from emp;
```

```
  NAMES
1 ADAMS/ALLEN/BLAKE/CLARK/FORD/JONES/KING/MARTIN/MILLER/SCOTT/SMITH/TURNER/WARD
```

Scenario 2: we can use listagg to reverse a string.

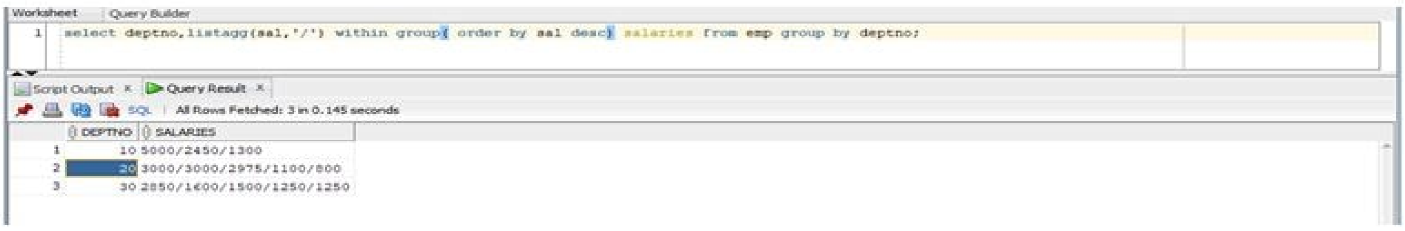


```
select listagg(substr('basavaraj',-level,1)) within group ( order by rownum asc) reverse_name from dual connect by level <= length('basavaraj');
```

```
All Rows Fetched: 1 in 0.143 seconds

  REVERSE_NAME
1 jaravasab
```

Scenario 3: list all salaries in a single row by groupwise.



```
select deptno,listagg(sal,'/') within group( order by sal desc) salaries from emp group by deptno;
```

```
All Rows Fetched: 3 in 0.145 seconds

  DEPTNO SALARIES
1     10 5000/2450/1300
2     20 3000/3000/2975/1100/800
3     30 2850/1600/1500/1250/1250
```

NULL Functions in SQL

There are different types of Null Functions is there..,

1) ISNULL():

ISNULL() Is a Function .. which is used to replace NULL Values

SYNTAX:

SELECT colomn(s), ISNULL(coloumn_name, Value-to-replace)

FROM table_name

Example:

Take below table table Name: “Students”

Name	Marks
Kumar	98
Ramar	NULL

Query: here we find the sum of marks of all students if any Marks of any students is not available, use Mark as “35”

Syntax Via Example:

SELECT SUM(ISNULL(Marks,35) As Marks

FROM Students;

OutPut

Marks
133

ISNULL() functions is used to test the expression in NULL or not ., Suppose the expression give the value “NULL” it give the TRUE or it Gives FALSE .

Syntax:

SELECT coloumn(s)

FROM table-name

WHERE ISNULL(coloumn_name);

Example:

Take below table ”table Name: “Students”

Name	Marks
Kumar	98
Ramar	NULL

Query:

Give the Name of the all Student whose Marks is available in the table (not NULL)

SELECT Name

FROM Students

WHERE ISNULL(Salary);

Output:

Name
Ramar

2) IFNULL

IFNULL is same like ISNULL the only one condition is first value should not be NULL. It seems like a default constraint to add null value to static value.

Syntax

SELECT Coloumn(s), IFNULL(Coloumn_name, value_to_replace)

FROM table_name

Example

Take below table ”table Name: “Students”

Name	Marks
Kumar	98
Ramar	NULL

Query: here we find the sum of marks of all students, if any Marks of any students is not available, use Mark as “35”

OutPut

Marks
133

3) COALESCE

This Coalesce Is The Function Which Returns The First Non-Null From The arguments

SELECT coloumn(s), COALESCE(expression_1,… expression_n)

FROM table_name

Example:

Take below table ”table Name: “Students”

Name	Phone number-1	Phone number-2
Kumar	1234567890	2345678901

Ramar	NULL	5689741425

[/su_table]

Query: fetch the name , phone number of each students

SELECT Name, COALESCE (Phone number1,Phone number2) As Student Contact No

From students;

Output

Name	Student Contact No
Kumar	2345678901
Ramar	5689741425

4) NULLIF

Considers two data here. if two data are equal means it will return NULL Result

Syntax

SELECT Name, NULLIF (Expression1, Expression2)

FROM Table_name;

Example:

Take below table ”table Name: “Students”

Name	Sub1	Sub 2
Kumar	75	36
Ramar	61	61

SELECT Name, NULLIF(Sub1,Sub2)

From students;

OutPut

Name	NULLIF(Sub1,Sub2)

Kumar	75
Ramar	NULL

How to Get the names of the table in SQL

We are providing the data for the SQL Server or MySQL or Oracle whichever we want easily we can create a table and a database for providing the necessary data to the fields for created database tables.

In the names of the tables, we are providing the data's and information's are using the SCHEMA and TYPE and ALL.

SYNTAX:

SELECT * FROM INFORMATION_SCHEMA.TABLES

WHERE:

INFORMATION_SCHEMA: For providing the database details we can view and retrieves the schemas from the database itself and views can be found in the SQL server instances using the master database details VIEWS/ SYSTEM VIEWS.

sys.tables:

select * from sys.tables

sys.objects:

select * from sys.objects where type = 'U'

INFORMATION_SCHEMA.TABLES: This schema will allow getting all about the information's of the schema_tables and views the database details itself.

sys.sysobjects:

select * from sys. sysobjects where type = 'U'

information_schema.tables:

select * from INFORMATION_SCHEMA.TABLES where TABLE_TYPE = 'TABLE'

SAMPLE DATA – SQL QUERY

mysql> SELECT table_name FROM information_schema.tables WHERE table_type = 'base table' AND table_schema='test';

INFORMATION_ TABLE VIEWS:

TABLE_NAME
DEPARTMENT
EMPLOYEE
ROLE
USER

RESULTANT:

Four rows in set (0.00 sec)

HOW TO PRINT DUPLICATE ROWS IN A TABLE

Using the query how to print the duplicates in the given set of elements which can similarly like subqueries because repeated data can be going to displaying in the outputs.

Take a set of elements which can be given below for our references.

S-NAME	S-CLASS
RAMU	TENTH
RAJU	ELEVENTH
SITA	TWELETH
MARRY	TENTH
RAMU	TENTH

We can find the above table we are provided the some sample set of elements some duplicates entries are given so using the query how the query how to display the repeated data.

SELECT S-NAME, S-CLASS FROM table1

GROUP BY -NAME, S-CLASS

HAVING COUNT(*) > 1

There are two different ways we can specifying the data set are given below

simple approach

Best approach: simple approach: this approach are mainly using to count the all the data in the given set of elements in the database and also some repeated duplicates entries are in the database in the given set of elements.

Best approach: Using these approaches are very fastest and quickly we can get the outputs using the keyword GROUP BY and HAVING methods can be used to retrieves the data faster than best approach.

SAMPLE DATA – SQL QUERY

Given a set of elements in the database using the SQL query for displaying the duplicates entries in the given data

S-NAME	S-CLASS
RAMU	EIGHT
RAJU	ELEVENTH
RITA	NINETH
SITA	TWELETH
RAVI	FIFTH
RAMU	EIGHT
SITA	TWELETH
RAVI	FIFTH

RESULTANT:

S-NAME
RAMU
SITA
RAVI

Finally, we are displaying only the duplicate entries in the given set of data in the database**.**

SQL CONSTRAINTS:

Constraints we are used in SQL created and altered the columns, what are all the Columns we Need to use Unique, Primary, and References related to Foreign Keys.

Some Columns need to assign some default constraints For EX: Default (‘ ‘) Empty, Default (0) Numeric Zero, Default(19000101) Date and Time Data Time Data Type Columns, Default (‘Y’), Default (‘N’)

Some columns incase insert Null Reference some select and exec Queries user in projects we will Face Null related Exception that cases to avoid to use

NOT NULL Constraint

CHECK constraint used for some employee-related age restriction we are mostly used, What are all the column we need to restrict while creating the table.That column we are using this constraint.

Above mentioned all Constraints Table Create, Drop, Alter Syntax and Examples:

SYNTAX:

Create Table tablename(Column1 Data type Constraint, Column2 Data type Constraint)

UNIQUE CONSTRAINTS SYNTAX:

Create table Table Name(Column1 Data type Not null Unique)

Or

Create table Table Name(Column1 Data type Not null ,

Unique (Column1))

PRIMARY CONSTRAINTS SYNTAX:

Create table Table Name(Column1 Data type Not null Primary Key)

Or

Create table Table Name(Column1 Data type Not null ,

Primary Key(Column1))

Difference and Definition For unique & primary Key

Unique and Primary Key Both used columns not allowed Duplicates
If we are used unique system will allow to delete and insert without Identity ON or OFF
If We are used primary Key Once we On or OFF identity after that only it will allow to delete and insert this columns

Query to make Identity ON or OFF

SET IDENTITY_INSERT Table name ON

SET IDENTITY_INSERT Table name OFF

NOT NULL & DEFAULT CONSTRAINT SYNTAX:

Create Table table name(Column1 Data type Not Null ,

Column2 Data type Not Null default(‘ ‘),

Column2 Data type Not Null default(0))

CHECK CONSTRAINT SYNTAX:

Create Table table name(Column1 Data type Not Null ,

Check(column1>=Value))

Or

Create Table table name(Column1 Data type Not Null ,

Column2 Data type Not Null default(‘ ‘),

Constraint CHK_Table name Check(cloumn1>=Value and Column2= Value) **)**

FOREIGN KEY CONSTRAINT SYNTAX:

Create table tablename(column1 data type not null,

Foreign key references table name(column1))

Foreign key reference mostly used source and destination table If we refer some destination table from the source table column, it will not allow deleting referred to table value. 1st need to delete destination table value after that Only will allow base table value.

Example:

Employee master creation, Table Name- Employee, Columns-

Name, Id, DOB, DOJ, Department, Designation, Address, Aadhaar Number, Mobile Number, Left Flag, left Date, Age

Create table employee (empid [int] identity (1,1) Not Null, Empname [varchar](50) not null default(‘ ‘),

DOB [Smalldatetime]not null default(‘01/01/1900’),

DOJ [Smalldatetime]not null default(‘01/01/1900’),

Department[Varchar](50) not null default(‘ ’),

Designation[Varchar](50) not null default(‘ ’),

Address[Varchar](100) not null default(‘ ’),

Aadhaar Number [Varchar](100) not null default(‘ ’),

Mobile Number [Varchar](100) not null default(‘ ’),

Left Flag [Char] (1) not Null default(‘N’),

Left Date [Smalldatetime]not null default(‘01/01/1900’),   Age [int],   check(age>=18)

Primary key(empid))

Check Constraints

Check Constraints is used to restrict the values placed in the column. Generally, Check constraints is used in the create table command and alter table command. In the check constraints, we can use the relational operators and list of values. If we try to place the values out of range or not in the list of values, it doesn’t allow to place the value in the column.

We have two option to add check constraints for the particular column. First, at the time of table creation itself, we can add the Check Constraints for the specific column. Second, you can also add the column after the table creation using alter command

Syntax to add check constraints in the Table creation

CREATE TABLE TABLE_NAME(COLUMN1 DATATYPE, COLUMN2 DATATYPE,…, CONSTRAINT CONSTRIANT_NAME CHECK(COLUMN_NAME WITH CONDITION));

Let see an example for creating the table with check constraints

SQL>CREATE TABLE STUDENT(ID INT,NAME VARCHAR2(30),DEPARTMENT VARCHAR2(10),CONSTRAINT CHECK_ID CHECK(ID >45123));

In the above example, table created with the name STUDENT and consists of three columns ID,NAME AND DEPARTMENT. This table contains one check constraints with the name where it check the column ID should always be greater than the value of 45123.

SQL>INSERT INTO STUDENT VALUES(1124,'ramu','IT');

While executing the above query, it does not allow the value in the database because the value of the column ID is not greater than 45123

Check Constraints can be added to an already created table using the check constraints condition in alter table command

Syntax to add check constraints in Table alter the operation

ALTER TABLE TABLE_NAME ADD CONSTRAINT CONSTRAINT_NAME CHECK(COLUMN_NAME CONDITION);

The below query is the example of check constraints in the alter table command. Here, We have added check constraints for the column DEPARTMENT in the table STUDENT which we created already. It checks the value of the column DEPARTMENT, it can have only the value of IT, ECE, CSE, MECH and no other values are allowed in this column

ALTER TABLE STUDENT ADD CONSTRAINT check_dept (DEPARTMENT IN ('IT','ECE','CSE','MECH'));

Drop Check Constraints

To remove the particular check constraints from the table, we can use the alter command to remove it completely. Let see the syntax for dropping the already created check constraints

ALTER TABLE TABLE_NAME DROP CONSTRAINTS CONSTRAINT_NAME;

In the existing table STUDENT, to delete or remove the check contraints check_dept from the column DEPARTMENT , we can use the below query

ALTER TABLE STUDENT DROP CONSTRAINT check_dept

Disable Check Constraints

If we don't want to use existing check constraints at the same it may be wanted future , we can disable the check constraints instead of deleting them. So that we can use them later and suspend now

The syntax for disabling the check constraints.

ALTER TABLE TABLE_NAME NOCHECK CONSTRAINTS CONSTRAINT_NAME;

In the table student, we can disable the check constraint check_id using the below query

ALTER TABLE STUDENT NOCHECK CONSTRAINTS check_id;

Minus Operator

Minus operator is used between two in the selection table. Minus operator will subtract the common values of the first table from the second table. Basically, it removes the common values from two tables and prints the rest of the rows or value from the first table

The basic syntax for the Minus operator

SELECT COLUMN1, COLUMN2,….. FROM TABLE1 MINUS SELECT COLUMN1, COLUMN2,…. FROM TABLE2 ;

NOTE: The number of columns in the select statement for both the tables should be the same. The data type of the corresponding column should be the same. The Minus operator will be supported by the oracle and not supported by the SQL SERVER.

Alternative Operator

The Alternative operator in sql is ‘AS’. The Alternative operator is used to give alternative name for the column or table. The alternative operator is used for creating alias name for the column or table .Basically Alias name are used to give temporary name for the tables and columns. This makes the column more readable .The Alternative Operator will be used mostly in the select command

Alternative operator for Column

SELECT column_name AS alias_Name from table_name;

Let us consider the table with name Customers.

Customers

first_name	last_name	city
John	Michael	Chennai
Raj	Kumar	Salem
Jaya	Krishna	Coimbatore

Example 1:

To view the first_name as Customer_Name , we can use the alternative operator.

SQL>SELECT first_name AS Customer_Name from Customers;

Output:

Customer_Name
John
Raj
Jaya

In this example, table customers contains the column with name as **Name** , we are creating an alias name as Customer_Name using the Alternative operator

The alternative operator mainly used to provide alternative name for concatenating of columns. If we are concatenating two columns as one , then using the alternative operator we can specify the column name for viewing.

Example 2:

SQL>Select first_name|| last_name AS Customer_Name from Customers;

Output:

Customer_Name
JohnMichael
RajKumar
JayaKrishna

The above example show the alternative operator used in the concatenating operator. It concatenates the two columns first_name and last_name as shown as column name Customer_Name from the Customers Table .

Alternative operator for Table

As Like columns, we can also specify the alias name for the table using the Alternative operator

Mostly in Join conditions , we use the Alternative operator for providing alias name for the different table to avoid the confusion of columns in the table . For example , consider two tables Customers and Product .The Product table having the two column id and name . The Customers table having three column id , name and product_id.

Customers

Id	Name	Product_id
102	Raj	56
105	Ram	89
108	Ravi	98

Product

Id	Name
56	Apples
89	Oranges
98	Mango

From the two tables, in order to view the customer name and product buyed by the customers we can execute the query below, we have use the below query. Here, we have

SQL>Select c.name AS Customer_Name, p.name AS Product_Name from Customers c , Product p where c.product_id = p.id;

Output:

Customer_Name	Product_Name
Raj	Apples
Ram	Oranges
Ravi	Mango

In the above example, we have created alias name for Name column in Customers table and alias name for Name column in Product .The alias name are created here using alternative operator.

SQL – Wildcard operators

Wildcard function is used in SQL statements with LIKE operator. LIKE operator is used in WHERE clause to find the specified string in a record. If you want to find the first name start with ‘Al’ and last name end with ‘er’, like this scenario we can use LIKE operator find the record.

The below keywords are used in LIKE operator,

% – It represents zero, one, or multiple characters

_ – It represents a single character

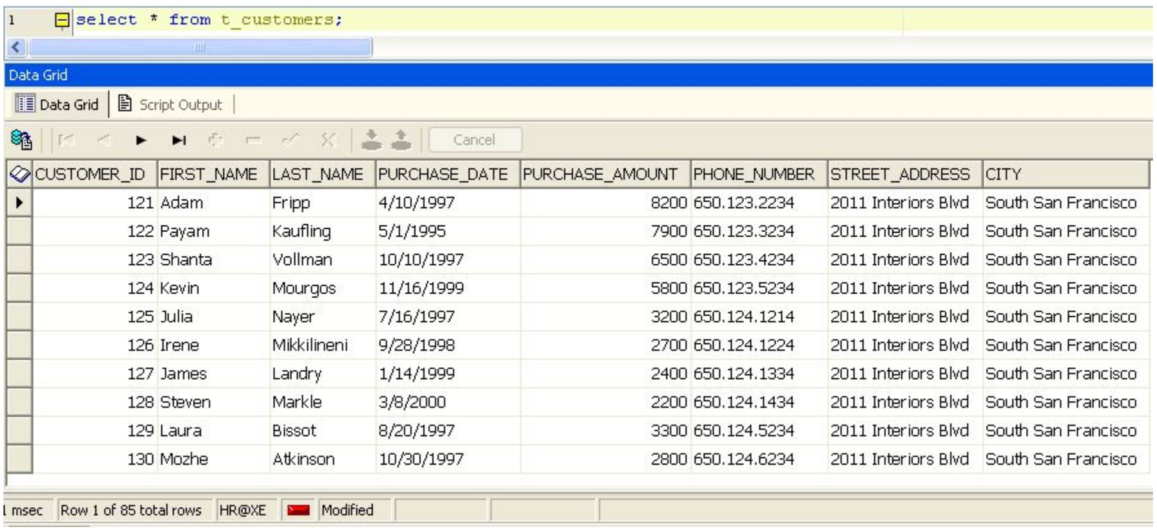
Here I explain about how to represent the keywords in **LIKE** operator with description,

LIKE Operator	**Description**
WHERE First_Name LIKE ‘A%’	Finds any values that start with “A”
WHERE First_Name LIKE ‘%e’	Finds any values that end with “e”
WHERE First_Name LIKE ‘%er%’	Finds any values that have “er” in any position
WHERE First_Name LIKE ‘_a%’	Finds any values that have “a” in the second position
WHERE First_Name LIKE ‘E__%’	Finds any values that start with “E” and are at least 3 characters in length
WHERE City LIKE ‘T%o’	Finds any values that start with “T” and ends with “o”

Let’s take some examples to define Wildcard operators use in LIKE operator. I just take the below table (t_customers) as sample data to explain the Wildcard operators.

Examples:

Actual Table: T_CUSTOMERS



```
select * from t_customers;
```

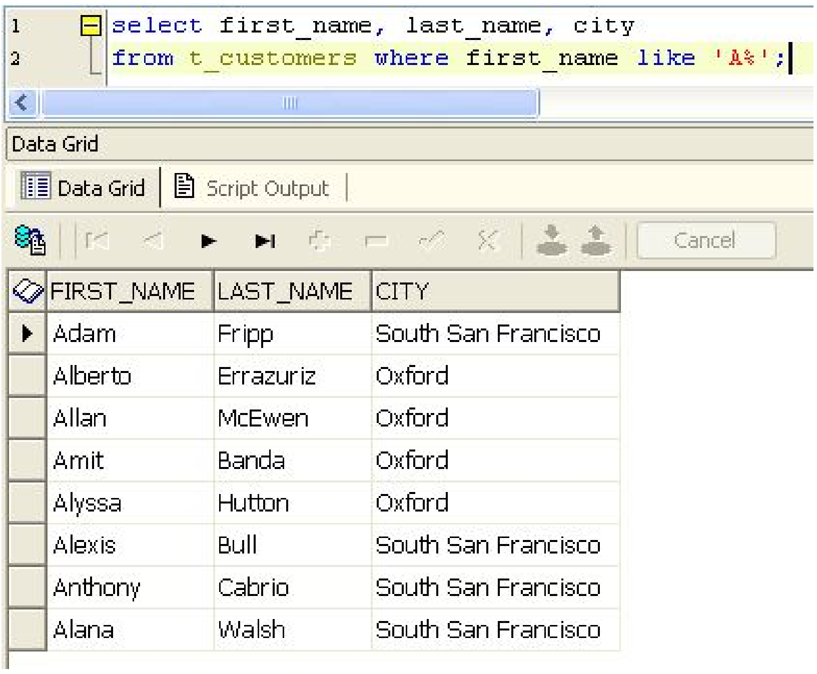
CUSTOMER_ID	FIRST_NAME	LAST_NAME	PURCHASE_DATE	PURCHASE_AMOUNT	PHONE_NUMBER	STREET_ADDRESS	CITY
121	Adam	Fripp	4/10/1997	8200	650.123.2234	2011 Interiors Blvd	South San Francisco
122	Payam	Kaufling	5/1/1995	7900	650.123.3234	2011 Interiors Blvd	South San Francisco
123	Shanta	Vollman	10/10/1997	6500	650.123.4234	2011 Interiors Blvd	South San Francisco
124	Kevin	Mourgos	11/16/1999	5800	650.123.5234	2011 Interiors Blvd	South San Francisco
125	Julia	Nayer	7/16/1997	3200	650.124.1214	2011 Interiors Blvd	South San Francisco
126	Irene	Mikkilineni	9/28/1998	2700	650.124.1224	2011 Interiors Blvd	South San Francisco
127	James	Landry	1/14/1999	2400	650.124.1334	2011 Interiors Blvd	South San Francisco
128	Steven	Markle	3/8/2000	2200	650.124.1434	2011 Interiors Blvd	South San Francisco
129	Laura	Bissot	8/20/1997	3300	650.124.5234	2011 Interiors Blvd	South San Francisco
130	Mozhe	Atkinson	10/30/1997	2800	650.124.6234	2011 Interiors Blvd	South San Francisco

1. **The following example is uses ‘%’ to find the customer’s FIRST_NAME start with ‘A’ letter.**

Query:

select first_name, last_name, city

from t_customers where first_name like 'A%';



```
select first_name, last_name, city
from t_customers where first_name like 'A%';
```

Data Grid

FIRST_NAME	LAST_NAME	CITY
Adam	Fripp	South San Francisco
Alberto	Errazuriz	Oxford
Allan	McEwen	Oxford
Amit	Banda	Oxford
Alyssa	Hutton	Oxford
Alexis	Bull	South San Francisco
Anthony	Cabrio	South San Francisco
Alana	Walsh	South San Francisco

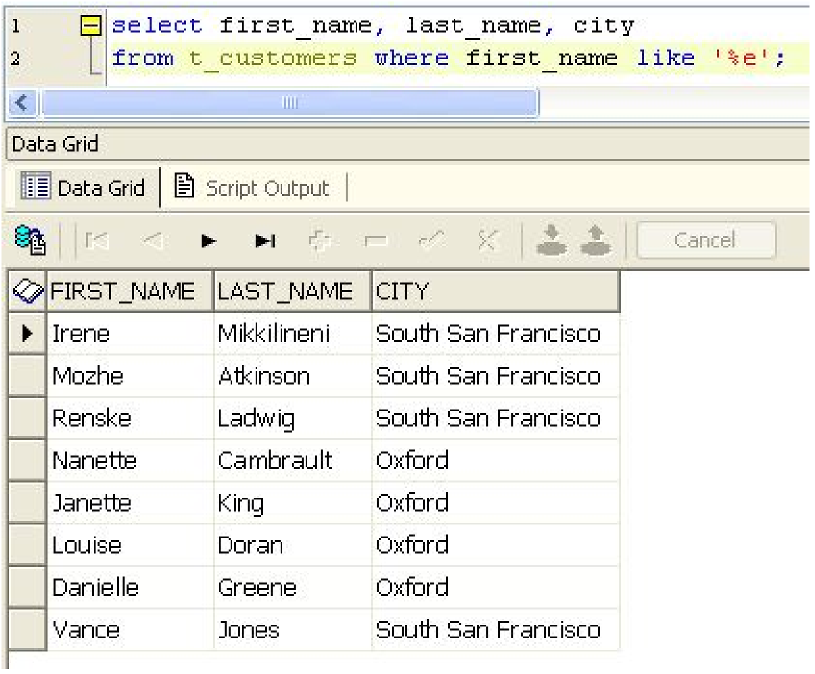
Here 'A%' (Wildcard operator) perform like to show the result start with 'A' and followed by some charters.

2. The following example is uses '%' to find the customer's FIRST_NAME end with 'e' letter.

Query:

select first_name, last_name, city

from t_customers where first_name like '%e';



```
select first_name, last_name, city
from t_customers where first_name like '%e';
```

Data Grid

FIRST_NAME	LAST_NAME	CITY
Irene	Mikkilineni	South San Francisco
Mozhe	Atkinson	South San Francisco
Renske	Ladwig	South San Francisco
Nanette	Cambrault	Oxford
Janette	King	Oxford
Louise	Doran	Oxford
Danielle	Greene	Oxford
Vance	Jones	South San Francisco

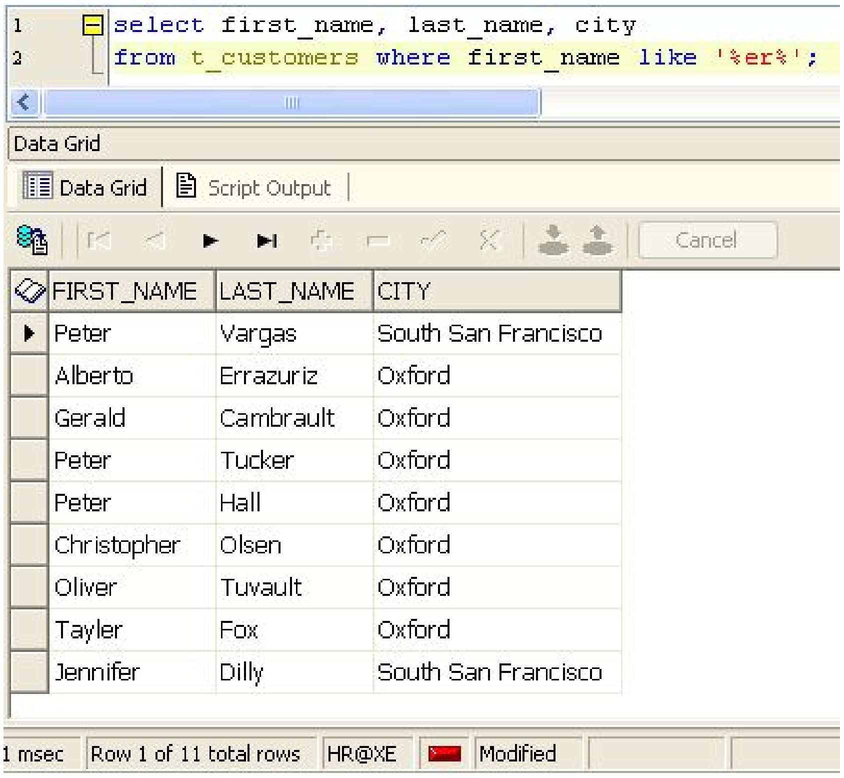
Here '%e' perform like to display the results of first_name end with 'e' letter and preceded by some strings.

3. The following example is uses '%' to find the customer's FIRST_NAME contain 'er' letter in any position.

Query:

select first_name, last_name, city

from t_customers where first_name like '%er%';



```
select first_name, last_name, city
from t_customers where first_name like '%er%';
```

FIRST_NAME	LAST_NAME	CITY
Peter	Vargas	South San Francisco
Alberto	Errazuriz	Oxford
Gerald	Cambrault	Oxford
Peter	Tucker	Oxford
Peter	Hall	Oxford
Christopher	Olsen	Oxford
Oliver	Tuvault	Oxford
Tayler	Fox	Oxford
Jennifer	Dilly	South San Francisco

```
1 msec | Row 1 of 11 total rows | HR@XE | Modified
```

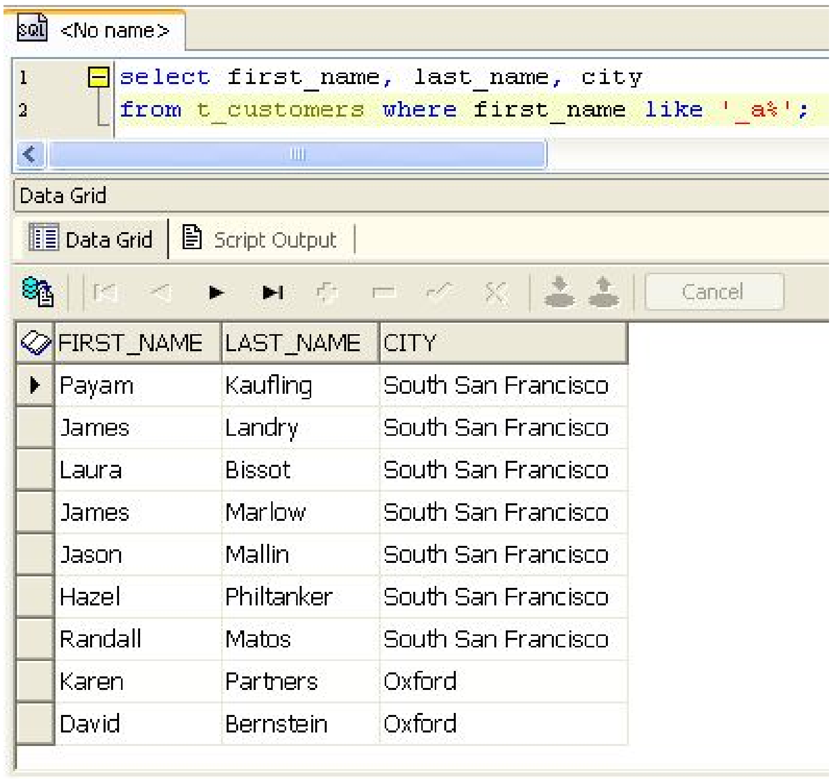
Here '%er%' is used to find the results of first_name whoever contain 'er' letter in their name.

4.The following example is uses '%' to find the customer's FIRST_NAME where '_a' letter appear in second position.

Query:

select first_name, last_name, city

from t_customers where first_name like '_a%';



```
select first_name, last_name, city
from t_customers where first_name like '_a%';
```

Data Grid

FIRST_NAME	LAST_NAME	CITY
Payam	Kaufling	South San Francisco
James	Landry	South San Francisco
Laura	Bissot	South San Francisco
James	Marlow	South San Francisco
Jason	Mallin	South San Francisco
Hazel	Philtanker	South San Francisco
Randall	Matos	South San Francisco
Karen	Partners	Oxford
David	Bernstein	Oxford

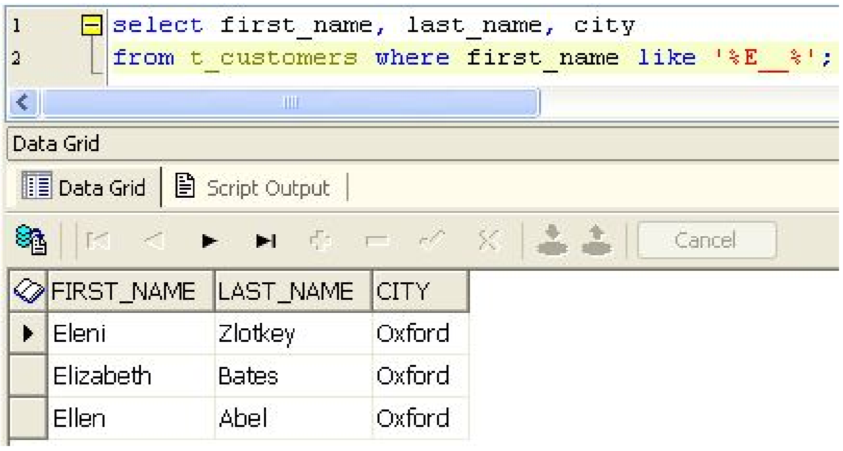
Here '%_a' is used to find the first_name whoever has 'a' letter at second position.

5. The following example is uses '%' to find the customer's FIRST_NAME start with 'E' and that value contain at least 3 letters.

Query:

select first_name, last_name, city

from t_customers where first_name like 'E__%';



```
select first_name, last_name, city
from t_customers where first_name like '%E__%';
```

Data Grid

FIRST_NAME	LAST_NAME	CITY
Eleni	Zlotkey	Oxford
Elizabeth	Bates	Oxford
Ellen	Abel	Oxford

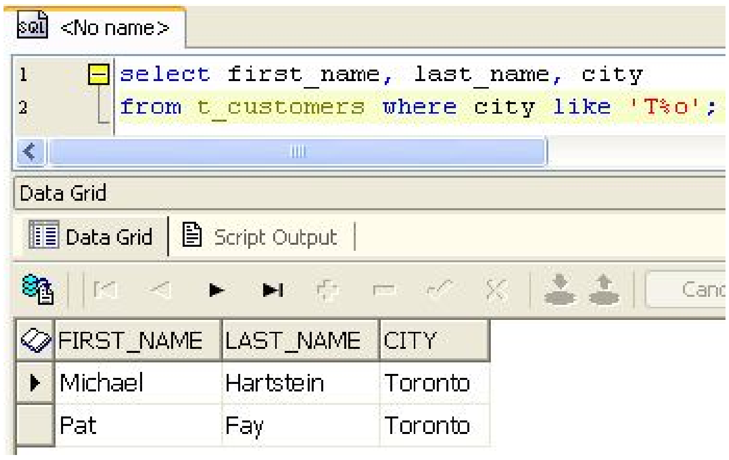
Here 'E__%' is used to find the first_name start with 'E' letter and the name should constrains at least 3 characters.

6. The following example is uses '%' to find the customer's CITY start with 'T' and end with 'o'.

Query:

select first_name, last_name, city

from t_customers where city like 'T%o';



```
select first_name, last_name, city
from t_customers where city like 'T%o';
```

```
FIRST_NAME  LAST_NAME  CITY
Michael     Hartstein  Toronto
Pat         Fay        Toronto
```

Here 'T%o' is used to find the customer's details whoever has city which start with 'T' and end with 'o'.

CONCATENATION OPERATOR

The symbol of the concatenation operator is || is used to add or concrete two or more columns or values in the table. Mostly the concatenation is used the select statement.

The concatenation is widely used in the select statement. The symbol of the concatenation operator is || is used to add or concate two or more columns or values in the table. If we want to join two values of two columns and show as a single column, in these scenarios we can use a concatenation operator.

The syntax for Concatenation operator

Select column_name1 || column_name2||…..from tablename

Let us consider the table with name Employee

Employee

Emp_Name	Emp_Id	Emp_phone
Raja	11895	9997779997
Somu	11896	9997779998
Raju	11897	9997779999
Priya	11898	9997779993

Harini	11899	9997779992

Example 1:

SQL>select Emp_Name ||Emp_Id from Employee;

Output:

Emp_Name ||Emp_Id
Raja11895
Somu11896
Raju11897
Priya11898
Harini11899

In the above example, two columns Emp_Name and Emp_id were joined as a single column using the concatenation operator. It displays the column name as Emp_Name ||Emp_Id with combines as one column

In between the concatenation operator, we can directly use the string literal to add some string in the first, last or middle of the column values. The String literals and column is separated by the concatenation operator.

The syntax for using string literal in concatenation operator

Select column_name1 || 'String literals' ||…..from tablename;

Example 2:

SQL> select Emp_Name || ' id is ' || Emp_Id from Employee;

Output:

Emp_Name ||Emp_Id
Raja id is 11895
Somu id is 11896

Raju id is 11897
Priya id is 11898
Harini id is 11899

In the above example ,two columns Emp_Name and Emp_id was joined, in between the two columns we have used the string literal ‘ id is ’ and ahown as a single column using the concatenation operator.It displays the column name as Emp_Name ||Emp_Id with combines as one column

If we are using the String literals in between two concatenation operator make sure the the String literals are enclosed within single quotes.

Between Operator

The Between operator is used to specify the range of values .The BETWEEN operator is used in the select statement. The values in the between can be number, alphabets and dates. It is also used in the insert, update, select and delete table commands. The between operator is used in the where clause. The AND operator is used between the two values of BETWEEN operator. The first value in between operator is used to specify the values greater than or equal to and second value represent lesser than or equal to .

syntax:

Select column_name1,column_name2,…….. from table_name where column_name between value_1 and value_2.

Example 1:

Let us consider the example below

Student

Id	Name	Marks	Date_of_Birth
102	Raj	50	08-01-2002
105	Ram	85	09-05-2004
108	Ravi	67	04-01-2007
109	Sona	78	22-11-2006
211	Disney	42	18-03-2002
258	David	74	30-06-2001

We can use the between operator here, to view the information from the table Student who has marks greater than or equal to 60 and below than or equal to 80. The query as follows

SQL>Select Name from Student where Marks between 60 and 80;

Output:

Name
Ravi
Sona
David

In the above query, since we have used the between operator for printing the column_name Name from Student table whose mark is between 60 and 80.We can also provide the date ranges of two values in between operator.

Example 2 :

SQL>Select id from Student where Date_of_Birth between 01-01-2001 and 01-01-2006;

Output:

Id
102
105
211
258

In the above example, we have given the query to print the id of the Students from Student Table whose Date_of_Birth between 01-01-2001 and 01-01-2006. Here it collects the id from the range given in between operator.

We can also use the Not operator in the between to avoid the specific range of values from the table

The Syntax for using Not operator with Between operator.

Select column_name1, column_name2,……. from tablename where NOT BETWEEN value_1 and value_2;

Let us consider an example