Application

Application is a set of programs to do a particular task

Standalone application

- Installation is mandatory.
- Internet is not required.
- Browswer is not requried/
- Stored in own device. e.g. => notepad, paint, word, excel, temple run etc.

Web application

- Installation is not mandatory.
- Internet is required.
- Browswer is required.
- Stored in server. e.g. => facebook, instagram, whatsapp, gmail, amazon etc.

Client-server application/ mobile application.

- installation is mandatory.
- Internet is required.
- Browswer is required.
- Stored in server and in own device. e.g. => facebook, telegram, instagram, amazon, gmail, pubg etc.

SQL (structured query langugage)

- SQL is also called as
  S - Simple
  E - English
  SQL - Querry
  L - Language

Data

It is a raw fact which describes attributes of an entity. (Attributes = properties) (Entity = living / non-living thing / object)

Database

Database is a place or medium which is used to store the data in systematic and organised manner.

On database we can perform CRUD operations:

- Create / Insert

- Read / Retreive
- Update / Modifty
- Drop / Delete

(DBMS) Database Management System.

DBMS is a software which is used to maintain and manage the database.

- In DBMS we can store the data in file format.
- Here we are using Querry Langugage (QL) to interact with (DBMS).
- Security and Authorization are the important features of DBMS.

Security:

```
No third party can acces it.
```

Authorization:

```
is giving permission and take back the given permission.
```

RDBMS (Relational DBMS).

RDBMS is a software which is used to maintain and manage the database.

- In RDBMS we can store the data in table form.
- Here we are using structured query language to interact with RDBMS.
- Security and authorization are two important features.

02/02/2023

Stucture of table

- Columns => The veritcal sectors in the table is known as columns.
- Rows => The horizontal sectors in the table is known as rows.
- Cell => The smallest unit in the table. or => The intersection of rows & columns is called as cell.
- Table => The organisation of rows and coolumns is called as table.

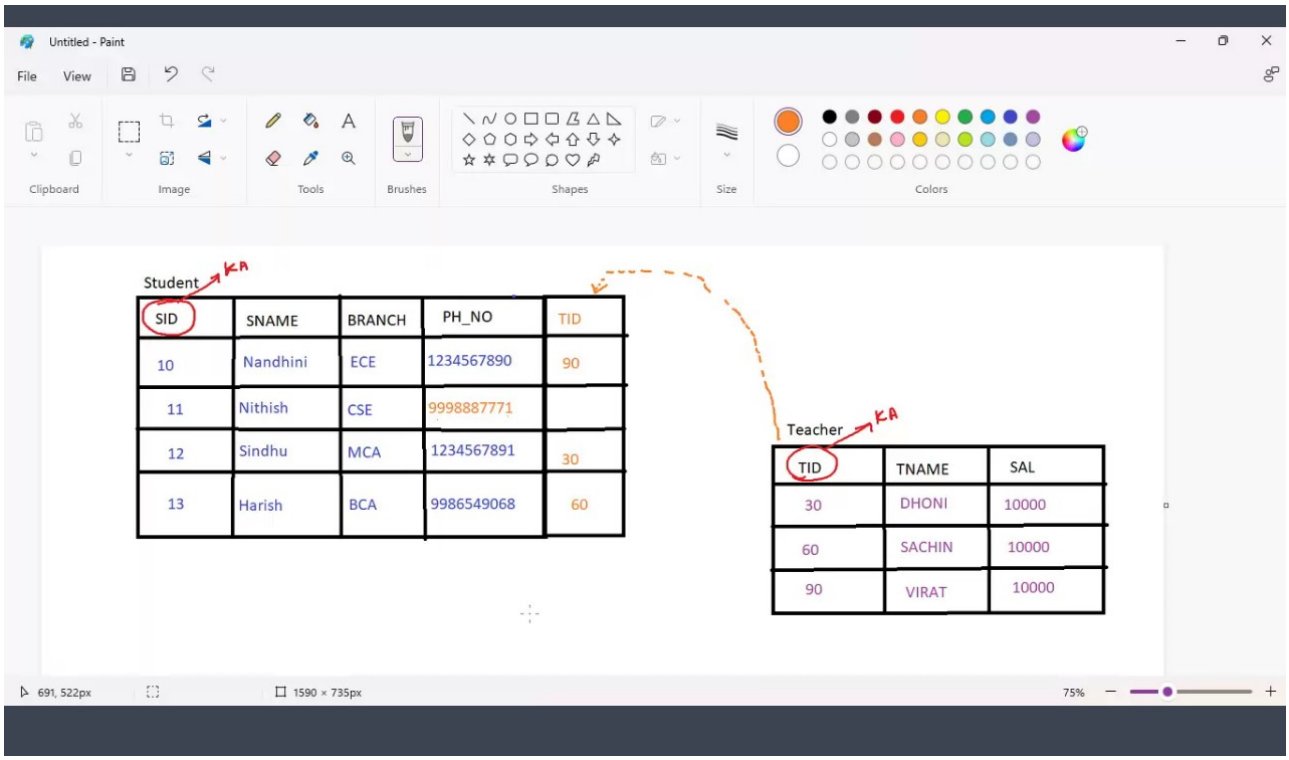
Relational Model

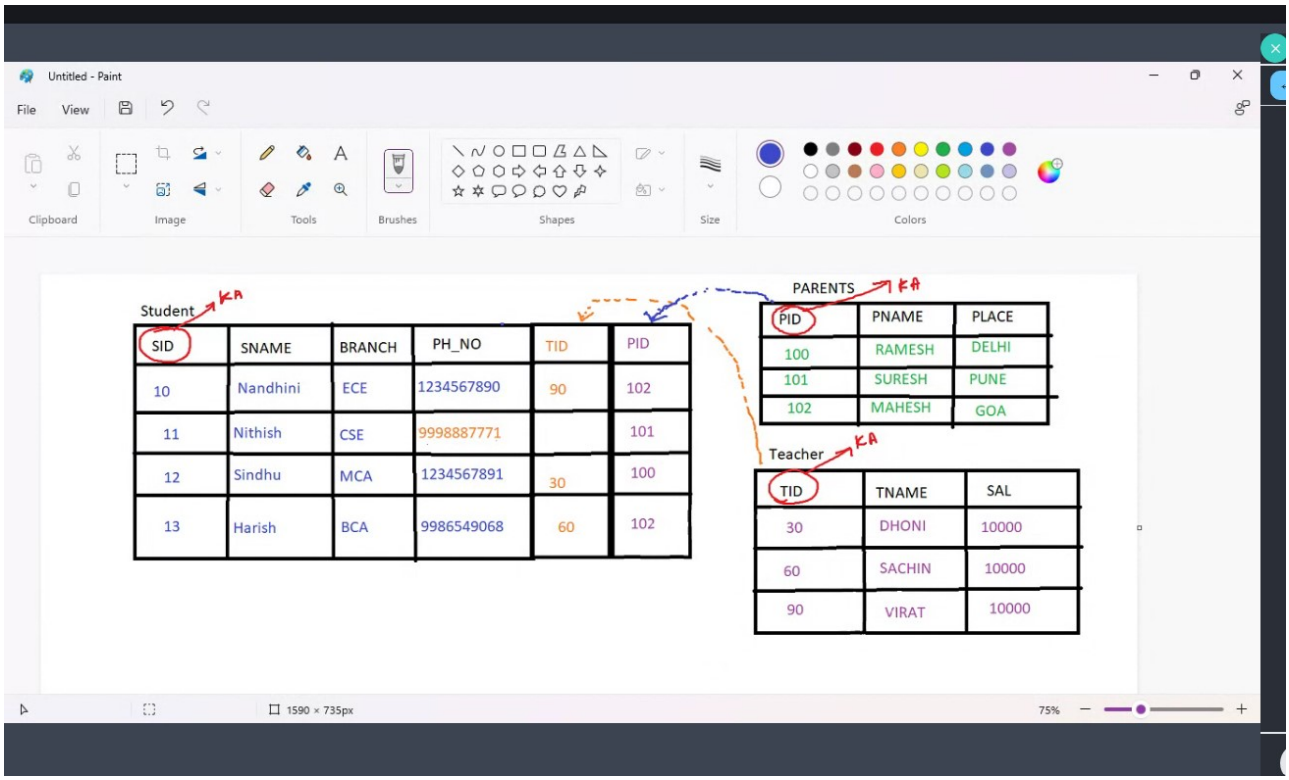
- The data scientist called E.F.Codd invented ralational model.
- Any DBMS software which follows relational model in it becomes RDBMS.
- In relational model we will store everything in the form of table.

- DBMS + RM = RDBMS

Rules of E.F.Codd

1. The data entered in the cell should be a single valued data (atomic data).
2. In RDBMS we can store everthing in the form of tables including metadata.
   metadata => the data about the data is called as metadata and it is stored in metadata table.
   for example: time, size, date, format of image present in table.
   this metadata is stored in metatable. metadata is created by software.
3. In RDBMS we can store the data in multiple tables if we want we can create the connection between the tables by using the "Key Attributers"
4. The data entered in the table can be validated in 2 steps:
   1) By assigning Datatype (mandatory).
   2) By assigning contraints (optional).





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Data Types

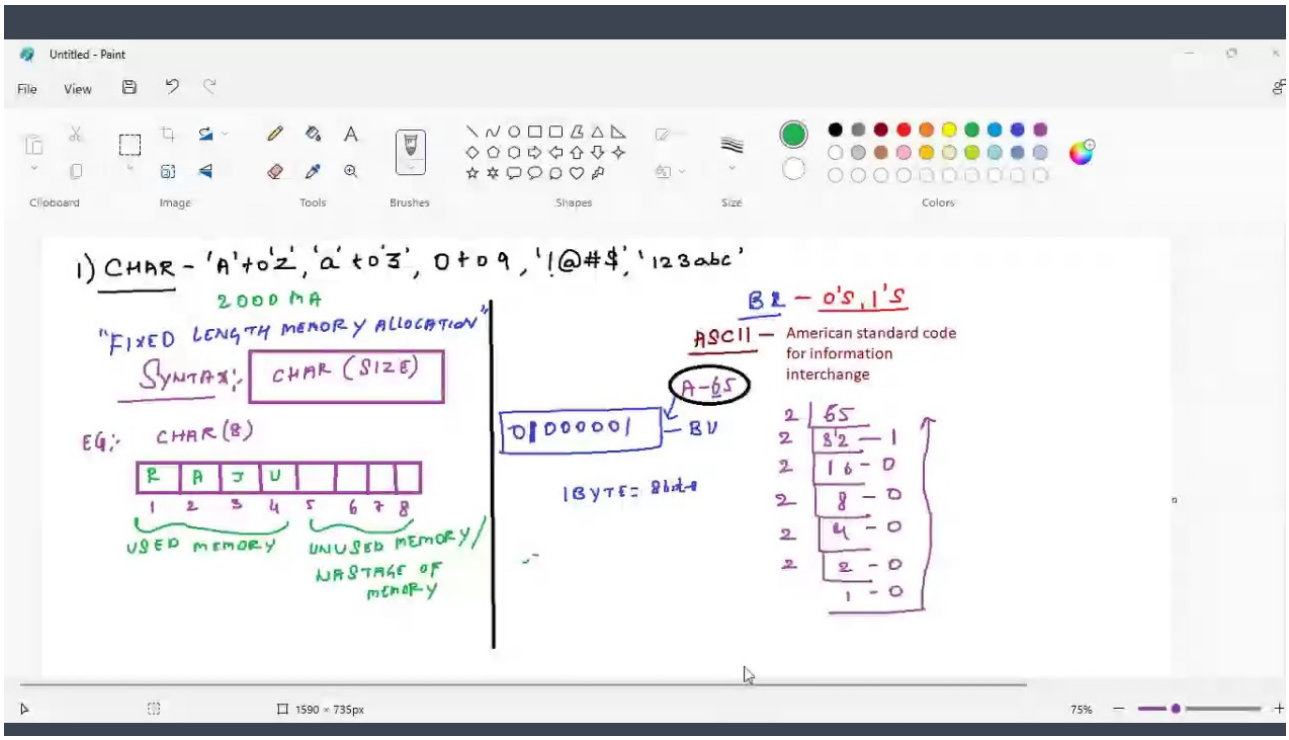
Datatypes are used to find what kind of data is present in a particular column.

Types:

```
1) Char datatype
2) Varchar/Varchar2 datatype
3) Date datatype
4) Number datatype
5) Large Object
   a) Character large object (LOB)
   b) Binary large object (BLOB)
```

1) Char datatype:

- It will accept A-Z, a-z, 0-9, '!@#$%^&', '!@#abc'
- whenever we use char datatype we want ot mention size for it.
- we can store upto 2000 memory allocation
- char uses "fixed length memory allocation".
- syntax = Chhar(size)
- it uses fixed length memory allocation.
- we have to define the length first.
- it can lead to memory wastage.



2)Varchar:

- It will accept 'A'to 'Z', 'a' to 'z', 0 to 0, '!@#$%^&', '!@#abc'.
- whenever we use varchar datatype we want to mention some size for it.
- we can store upto 2000 memory allocation.

- varchar uses "variable length memory allocation".
- Syntax = VARCHAR(size)
- unused memory will be used for other data,. (no memory wastage.)

Varchar2:

- It is an updated version of varchar
- we can store upto 4000 memory allocation\
- syntax = varchar2(size)

3) Date:

- it is used to store the data in a particular date format.
- syntax = Date

oracle date formats:

```
a) DD-MON-YYYY eg.=> '10-NOV-2023'
b) DD-MON-YY    eg.=> '10-NOV-23'
```

4) NUMBER datatype:

- it is used to store numerical values.
- syntax = Number(Precision[,scale])

eg. 999.99
where 999 is precesion and .99 is scale.

- Precision
    - Precision is nothing but interger values.
    - Precision cant be 0
    - Precision ranges from 1 to 38
    - There is no default value for precision
- Scale
    - Scale is nothing but decimal values
    - The default value of scale is 0.
    - scale ranges from -84 to 127

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`5) Large Object:-`

a) Character large object:
- It is used to store characters upto 4GB of size.
- Syntax: `CLOB`

b) Binary large object :
- It is used to store the binary value of image, mp4, mp3, document ....upto 4GB of size.
- Syntax: `BLOB`

Constraints

- Constraints are the extra validation given for a particular column.

Types:

1. Unique constraint
2. Not Null constraint
3. Check constraint
4. Primary key
5. Foreign key

1) Unique constraint:

- Unique is a constraint in which it will not accept repeated and duplicate values.

2) Not Null constraint:

- Not Null is a constraint in which it will not accept null values.

  Notes:-

  - Null means empty or nothing.
  - 0 is not a null value.
  - Any operations that can be performed with Null becomes Null.
  - eg.:-
    - 1 + Null = Null
    - 1 - Null = Null
    - 1 * Null = Null
    - 1 / Null = Null

3) Check constraint:

- Check is the constraint in which it will be given as extra validation depending upon the condition, if the condition is true it will accept the values else it will reject.

- eg.:-

  1. check (SAL > 0)
  2. check (LENGTH(PH_No) = 10)

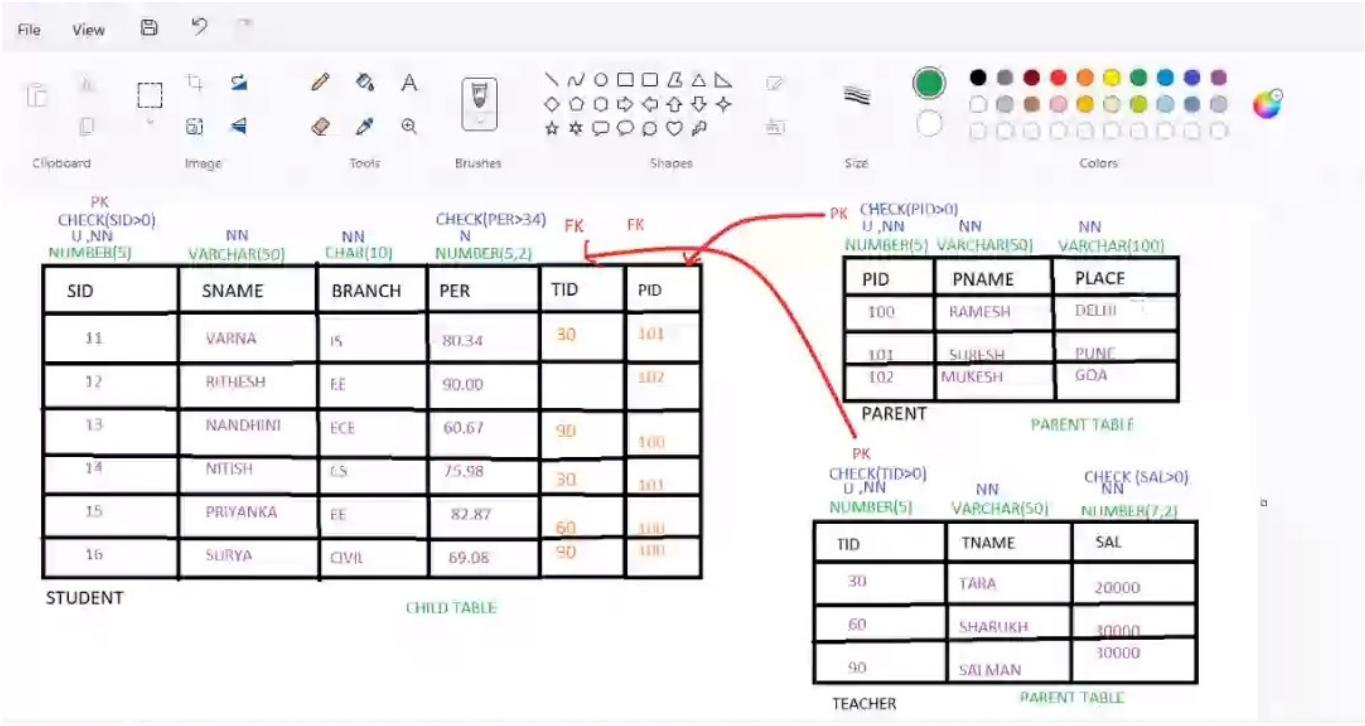
4) Primary Key:-

- Primary key is a constraint which is used to identify the record uniquely from the table characteristics of primary key.

- Primary key will not accept duplicate and repeated values.
- Primary key will not accept Null values.
- Primary key is a combination of unique and Not Null.
- Primary key is not mandatory but recommended to have one in an table.

5) Foreign Key:-

```
+Foreign key is used to create connection between multiple table characteristics
of foreign key.
+Foreign key will accept repreated and duplicate values.
+Foreign key will accept Null values.
  - To be a foreign key it should be the primary key in its own table.
  - Actually foreign key is present in child table but belong to parents table.
  - foregin key is also called as 'Referential integrity constraint'.
-Foreign key is not a combination of Unique and Not Null.
```



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Overveiw of SQL:-

1) Data Definition Language(DDL)

```
  - Create
  - Rename
  - Alter
  - Truncate
  - Drop
```

2) Data Manipulation Language(DML)

```
- Insert
- Update
- Delete
```

3) Transaction Controlled Langugage

```
- Commit
- Rollback
- Savepoint
```

4) Data Controlled Language

```
- Grant
- Revoke
```

5) Data Querry Langugage

```
- Select
```

- Projection
- Selection
- Joins

Important questions

```
-
-  1. what is data?
-  2. what is database?
-  3. what are CRUD and operations? give an example.
-  4. what is DBMS and RDBMS and tell the difference.
-  5. Tell the alternative name for Rows, Coumns.
-  6. Definition for Rows, Cell and Table
-  7. who invented Relational Model.
-  8. Rules of E.F. Codd
-  9. Explain Datatypes and tell the Difference between Var and Varchar.
-  10. Explain constraints and tell the difference between Primary key and Foregin
key
```

```
-  11. Another name for foregin key.
-
---
```

Data Query language (DQL):-

- It i a language in which we can get/fetch the data from already created table.
- types of statements:

Projection

- projection is used to fetch the data by selecting only columns.
- Syntax:-

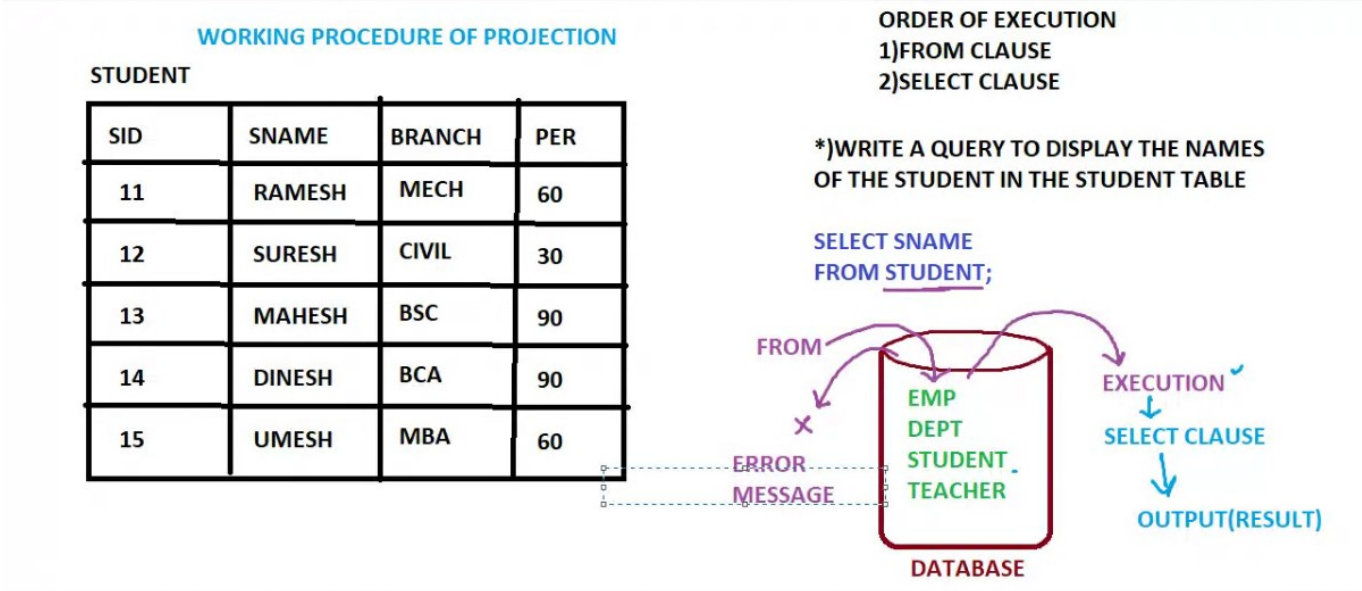
```
SELECT*/[DISTINCT],COL_NAME,EXPRESSION/[ALIAS]FROM TABLE_NAME;
```

- arguments written in [] square braces are optional
- there are 5 arguments in above example.
- 3 are mandatory and 2 are not mandatory.

ORDER OF EXECUTION:

```
1) FROM CLAUSE
2) SELECT CLAUSE
  - we have to specify SELECT clause first then FROM clasuse.
  - but form clause will be excecuted first.
```

working proceduure of projection img:



working procedure of projection:

```
- first FROM clause will starts the execution and search for the given table.
- if the table is present in the database it will be kept under execution.
- if the table is not present in  the database, it will be throwing you an eror message.
- after the execution of FROM clause, SELECT clause will starts the execution and gives you the output.
```

SELECT clasuse :-

- the job of select clasuse is to display the result and it is also responsible ffor the result table.

Semicolon(😉 :-

- it is used to end the statement or Query.

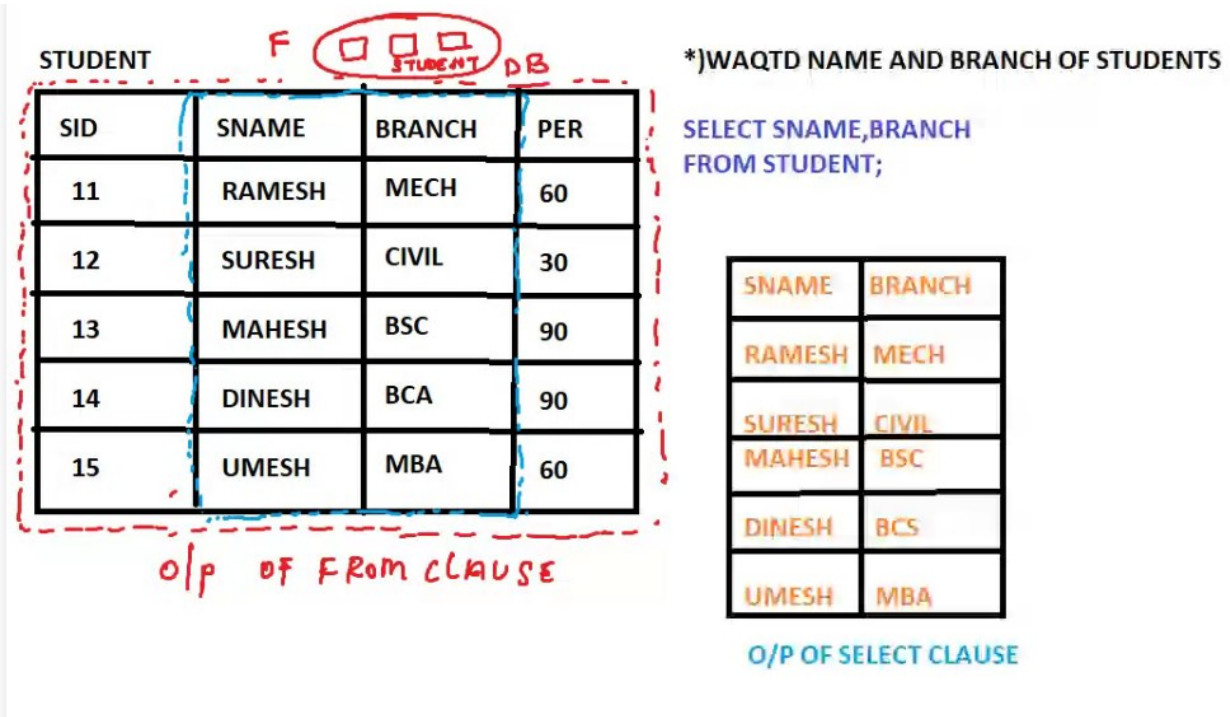
Seperator(,) :-

- it is used to wrtite the Multiple column names or Multiple argumentsub the SELECT clause.

Example:

Question. WAQTD (Write a query to display) name and branch of students.

- SELECT SNAME,BRANCH FROM STUDENT;
- **Answer:**



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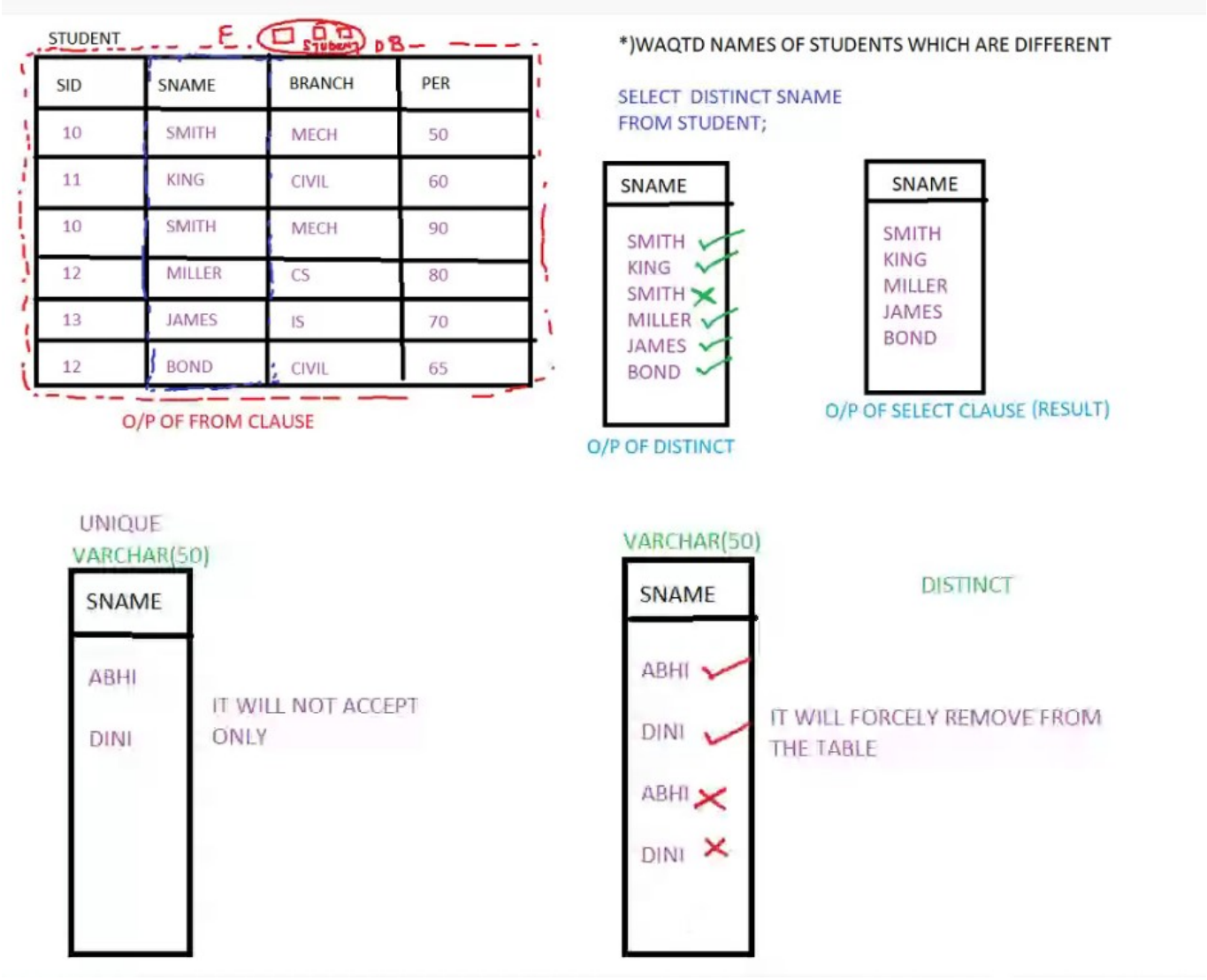
Distinct Clause :-

- Distinct clause is used to remove the duplicate values in the result.
- Distinct clause has to be passed as the first argument in the select clasuse.
- In distinct clasuse we can pass multiple column_names and it will remove the combination of columns which are repeated.

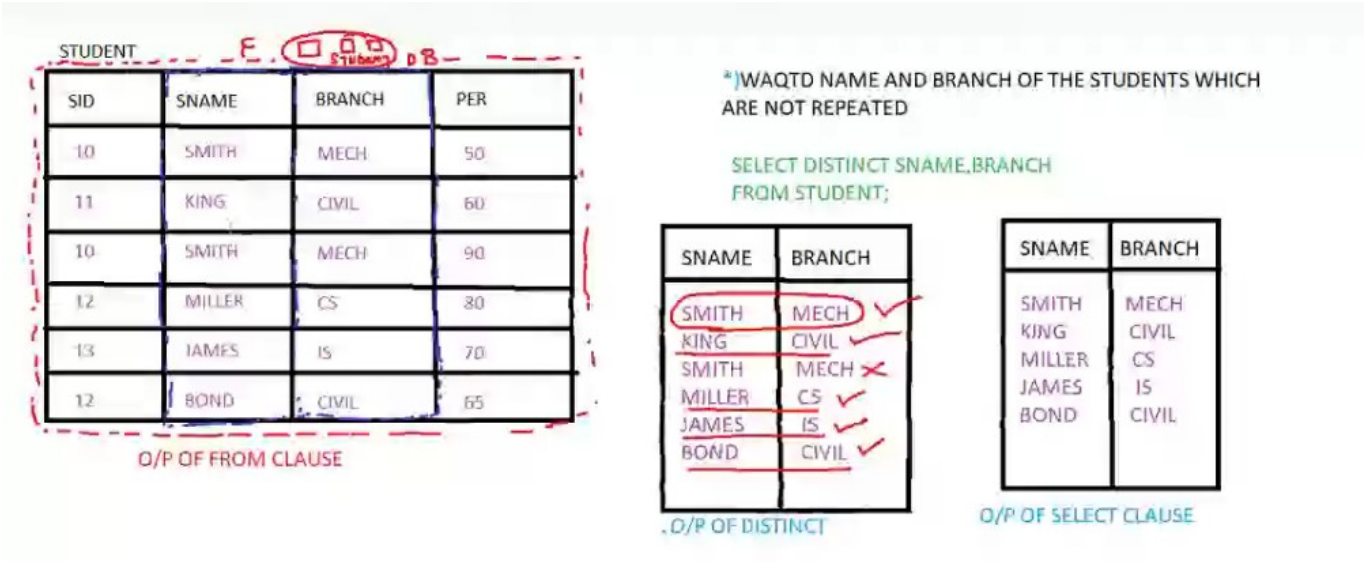
Note:-

```
- Distinct clause will remove all the duplicate records only if all the column values are same.
```

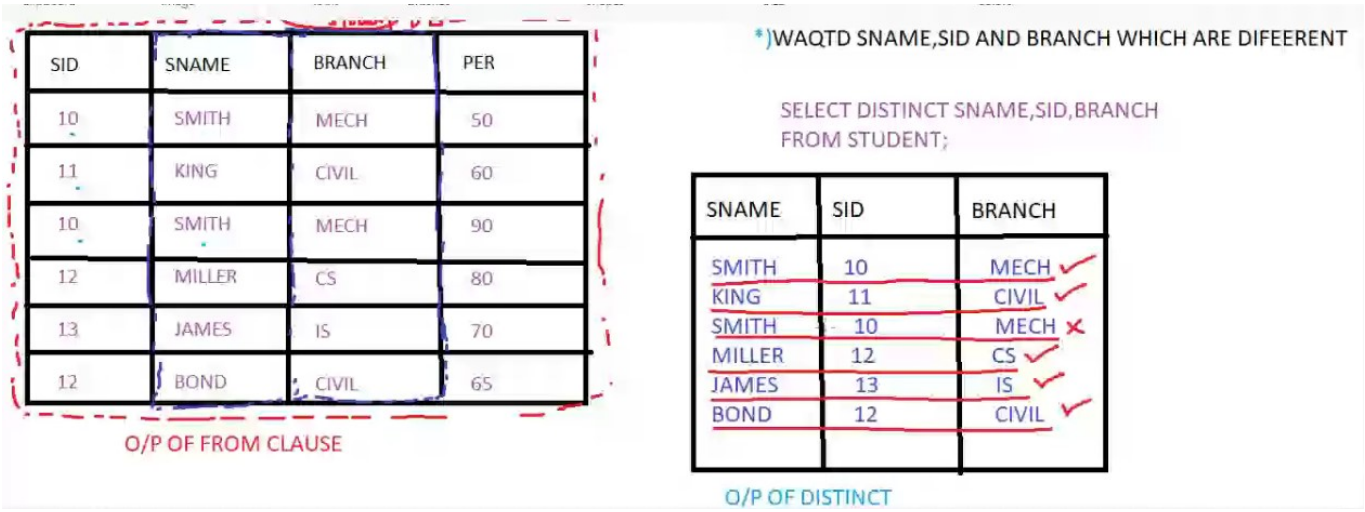
example 1:-



example 2:-



example 3:-

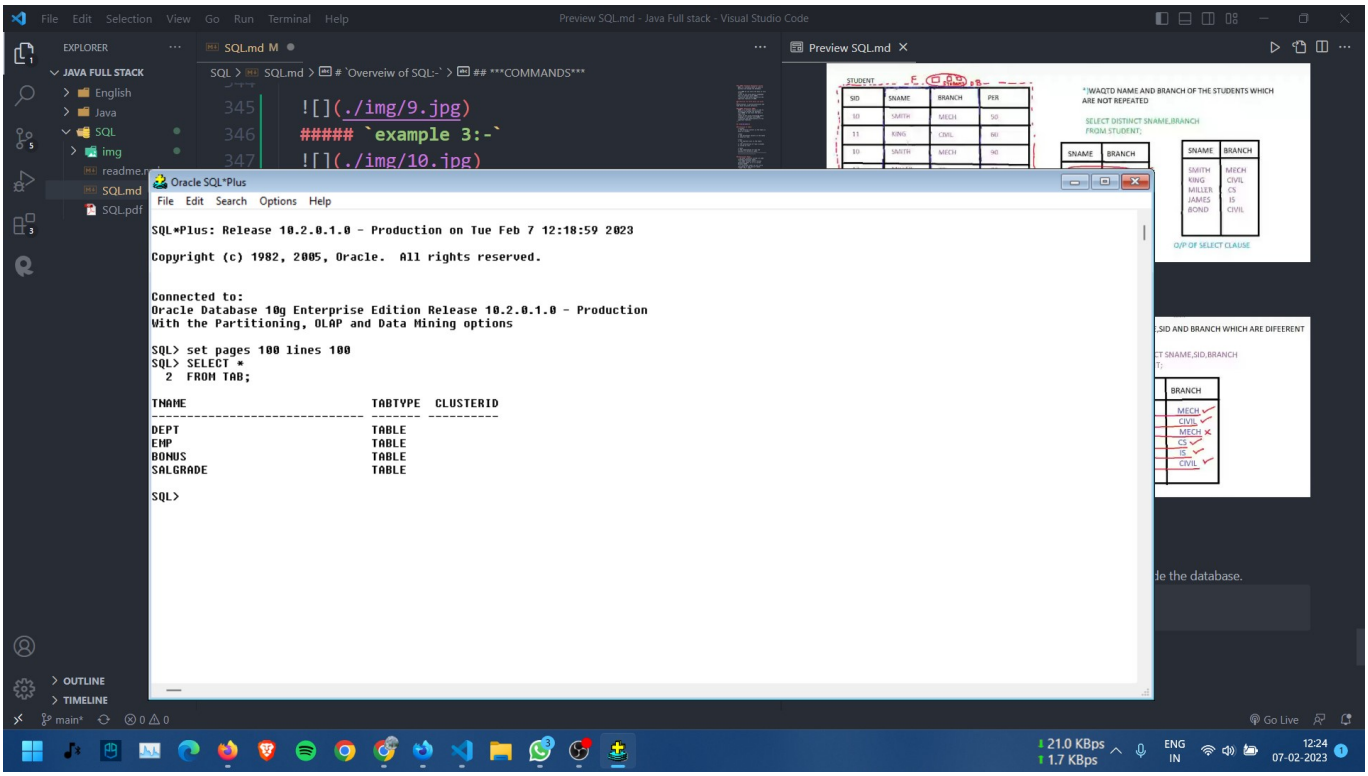


COMMANDS

1.

```
SELECT * FROM TAB;
```

```
- This command is used to get all the table names from the database.
```



2.

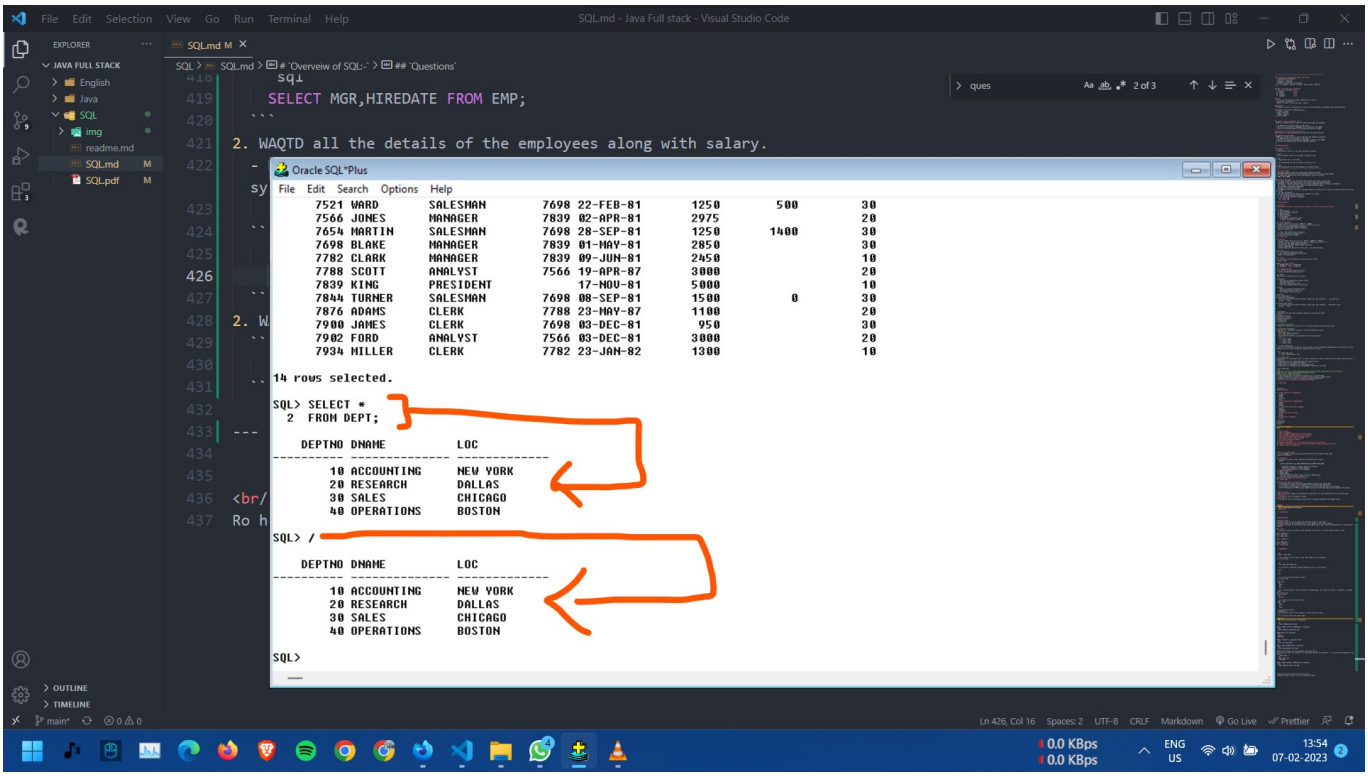
```
SET LINES 1000 PAGES 100;
```

- it is used to ellaborate the page length and lines of the software.

3. Slash

```
/
```

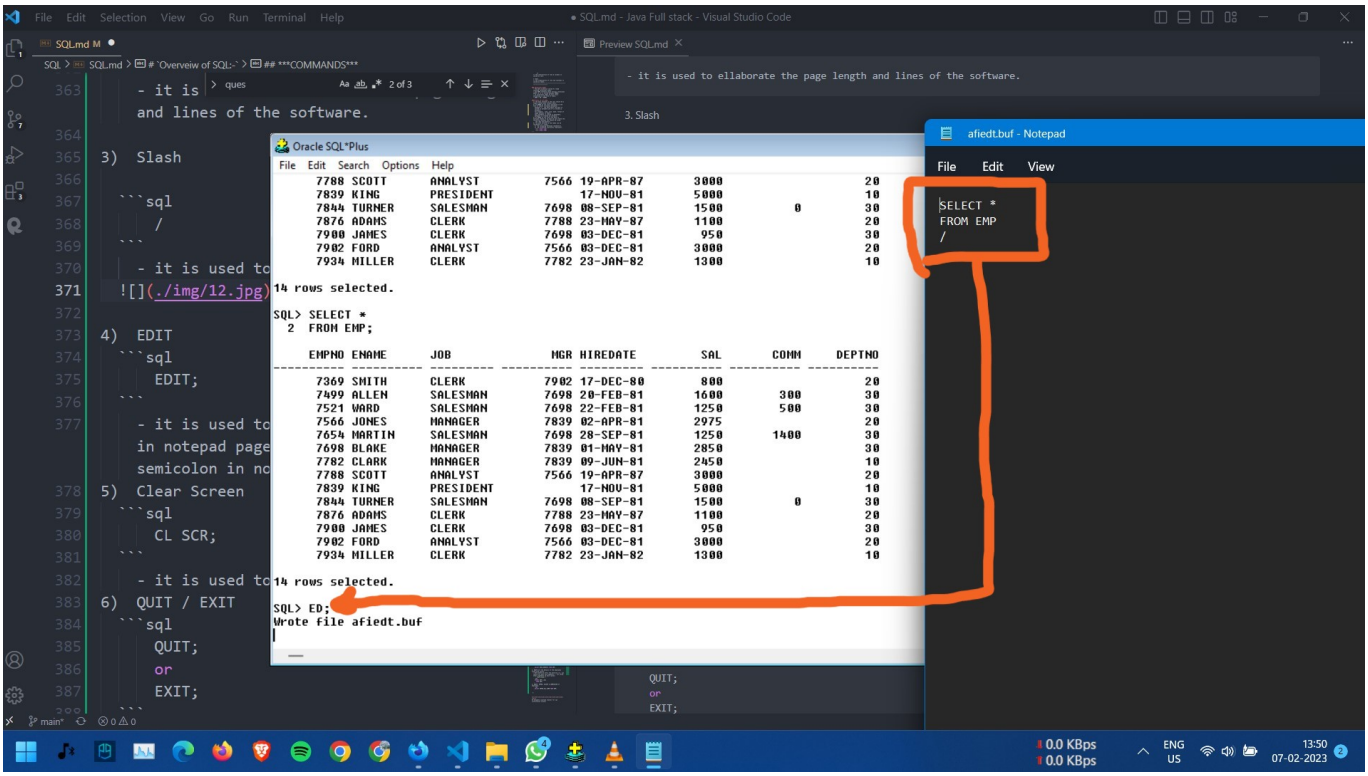
- it is used to get the previous output.



4. EDIT (ED)

```
EDIT;
OR
ED;
```

```
- it is used to modify or alter the query in notepad page, you  should not enter (;) semicolon in notepad page.
```



5) Clear Screen

```
CL SCR;
```

```
- it is used to clear the whole screen.
```

6. QUIT / EXIT

```
QUIT;
or
EXIT;
```

```
- to close the software.
```

7. ASTERISK (*)
   - it is used to fetch all the columns & records inside the table. or
   - it is used to fetcth the entire table.

Questions

1. WAQTD name and designation of employees.

```
SELECT ENAME,JOB FROM EMP;
```

2. WAQTD EMPNO, SALARY & COMMISSION of employees.

```
SELECT EMPNO,SAL,COMM FROM EMP;
```

3. WAQTD details of employees.

```
SELECT *
FROM EMP;
```

2. WAQTD location in department table.

```
SELECT LOC FROM DEPT;
```

2. WAQTD MGR& JOINING DATE of employees.

```
SELECT MGR,HIREDATE FROM EMP;
```

2. WAQTD all the details of the employees along with salary.

- Here before & after the Asterisk (*), you should not pass any arguments... for using other arguments we have syntax:
  `Table_name.*`

```
SELECT EMP.*,SAL
  FROM EMP;
```

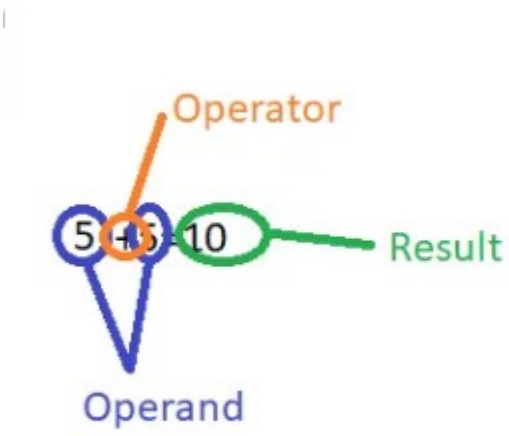
2. WAQTD EMPNO, SALARY & COMMISSION of employees.

```
SELECT EMPNO,SAL,COMM FROM EMP;
```

10/02/2023

Expression

- Expression is a combination of Operands and Operator. or
- Expression is a Statement which gives you the Result.



1. WAQTD ENNAME, SALARY & ANUAL SALARY of employees.

```
SELECT ENAME, SAL, SAL*12 FROM EMP;
```

```
SQL> SELECT ENAME,SAL,SAL*12
  2  FROM EMP;

ENAME          SAL     SAL*12
---------- ---------- ----------
SMITH             800       9600
ALLEN            1600      19200
WARD             1250      15000
JONES            2975      35700
MARTIN           1250      15000
BLAKE            2850      34200
CLARK            2450      29400
SCOTT            3000      36000
KING             5000      60000
TURNER           1500      18000
ADAMS            1100      13200
JAMES             950      11400
FORD             3000      36000
MILLER           1300      15600

14 rows selected.

SQL> SELEC
```

2. WAQTD NAME, SALARY, SALARY with the hike of 10%.

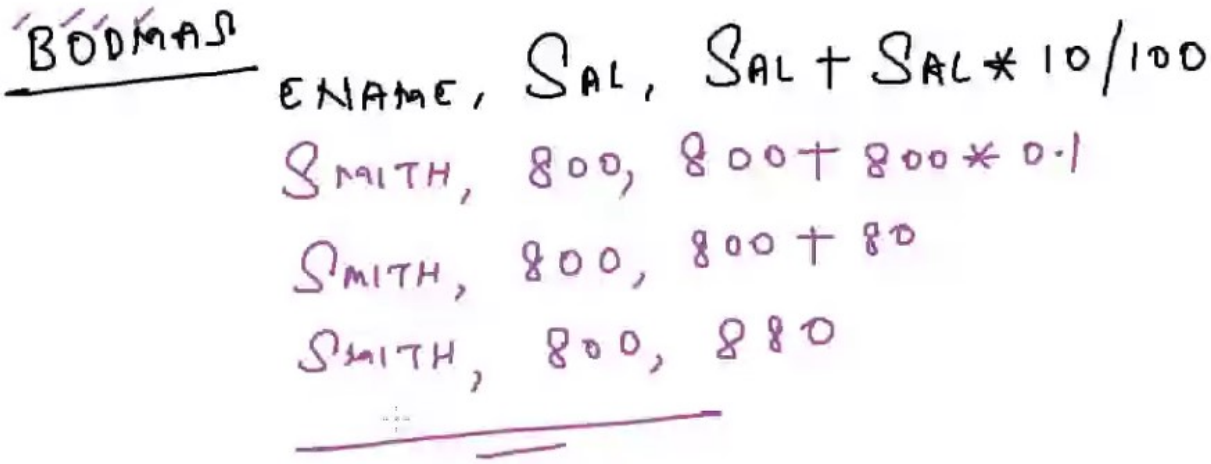
```
SELECT ENAME,SAL,SAL+SAL*10/100 FROM EMP;
```

```
SQL> SELECT ENAME,SAL,SAL+SAL*10/100
  2  FROM EMP;

ENAME             SAL SAL+SAL*10/100
---------- ---------- --------------
SMITH             800            880
ALLEN            1600           1760
WARD             1250           1375
JONES            2975         3272.5
MARTIN           1250           1375
BLAKE            2850           3135
CLARK            2450           2695
SCOTT            3000           3300
KING             5000           5500
TURNER           1500           1650
ADAMS            1100           1210
JAMES             950           1045
FORD             3000           3300
MILLER           1300           1430

14 rows selected.

SQL>
```



3. WAQTD NAME, SALARY, SALARY with the deduction of 10%.

```
SELECT ENAME, SAL, SAL - SAL*10/100 FROM EMP;
```

4. WAQTD all the details of employees with the 15% hike in salary.

```
SELECT EMP.*, SAL+SAL*15/100 FROM EMP;
```

5. WAQTD all the details of emp's with the deduction of 15% in salary.

```
SELECT EMP.*,SAL-SAL*15/100 FROM EMP;
```

6. WAQTD all the ENAME, SAL of EMP's with the hike of 10% in annual salary.

```
SELECT ENAME, SAL, SAL*12 + SAL*10/100 FROM EMP;
```

7. WAQTD all the ENAME, SAL of EMP's along with the deduction by 10% in annual salary.

```
SELECT ENAME, SAL, SAL*12-SAL*12/100 FROM EMP;
```

8. WAQTD ENAME, SAL & also half term SAL.

```
SELECT ENAME,SAL,SAL*6 FROM EMP;
```

9. WAQTD ENAME, SAL also PER DAY SALARY of EMP's.

```
SELECT ENAME,SAL, SAL/30 FROM EMP;

              OR

SELECT ENAME,SAL, SAL*12/365 FROM EMP;
```

10. WAQTD NAME, SAL, ANNUAL SALARY and also ANNUAL BONUS of 2000

```
SELECT ENAME, SAL, SAL*12,SAL*12+2000 FROM EMP;
```

11. WAQTD ENAME, COMMISSION & also increase of COMMISSION in 10%.

```
SELECT ENAME,COMM,COMM+COMM*10/100 FROM EMP;
```

12. WAQTD NAME, SAL and also MONTHLY BONUS of 1500.

```
SELECT ENAME,SAL,SAL+1500 FROM EMP.
```

ALIAS

- ALIAS is an alternative name given for a particular column.

- ALIAS can be used by the keyword called 'As'.
- ALIAS can be enclosed within double quotes (" ")and serperated by underscore (_).

NOTE:

```
- By calling ALIAS name the origional name will not change.
```

1. WAQTD NAME of emmployees with ALIAS.

```
   SELECT ENAME WORKER, FROM EMP;
```

2. WAQTD NAME, SAL AND SAL*12 with ALIAS.

```
  SELECT ENAME WORKER, SAL SALARY, SAL*12 ANNUAL_SALARY FROM EMP;
               OR
  SELECT ENAME KARAMCHARI, SAL TANAKHA, SAL*12 SALANA_TANAKHA FROM EMP;
```

3. WAQTD NAME, SALARY & also ANNUAL SALARY with ALIAS NAME.

```
  SELECT ENAME, SAL,SAL*12 "ANNUAL_SALARY" FROM EMP;
                 OR
  SELECT ENAME, SAL,SAL*12 "ANNUAL SALARY" FROM EMP;
                 OR
  SELECT ENAME, SAL,SAL*12 "ANNUALSALARY" FROM EMP;
                 OR
  SELECT ENAME, SAL,SAL*12 "ANNUAL_SALARY" FROM EMP;
                 OR
  SELECT ENAME, SAL,SAL*12 ANNUAL_SALARY FROM EMP;
                 OR
  SELECT ENAME, SAL,SAL*12 ANNUALSALARY FROM EMP;
```

ASSIGNEMENT EXPRESSIONS AND ALIAS

1. WAQTD name of the employee along with their annual salary.

```
  SELECT ENAME, SAL*12, FROM EMP;
```

2. WAQTD name & job for all the emploees with their half term salary.

```
  SELECT ENAME, JOB, SAL*6 FROM EMP;
```

3. WAQTD all the details of the employees along with an annual bonus of 2000.

```
SELECT EMP.*, SAL*12+2000 FROM EMP;
```

4. WAQTD name, salary, salary with hike of 10%.

```
SELECT ENMAE, SAL, SAL+SAL*10/100 FROM EMP;
```

5. WAQTD name and salary with deduction of 25%.

```
SELECT ENAME, SAL, SAL-SAL*10/100 FORM EMP;
```

6. WAQTD name and salary with monthly hike of 50.

```
SELECT ENAME, SAL+50 FORM EMP;
```

7. WAQTD name and annual salary with deduction of 10%.

```
SELECT ENAME, SAL*12-SAL*10/100 FROM EMP;
```

8. WAQTD total salary given to each employee (sal+comm)..

WITHOUT ENAME:

```
SELECT SAL+COMM FROM EMP;
```

WITH ENAME:

```
SE
LECT ENAME,SAL+COM FROM EMP;
```

9. WAQTD details of all the employees along with annual salary.

```
SELECT EMP.*,SAL*12 FROM EMP;
```

10. WAQTD details and designation along with 100 penalty in salary.

```
SELECT ENAME, JOB, SAL-100 FORM EMP;
```

11/02/2023

Ro helpmate (youtube channel for sql installation issues)