

Date
21/8/24

Unit - 3

ER Model

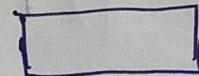
It was developed by Peter Chen in 1976. The ER diagram explains ten relationships among entities present in the database.

There are 3 components of an ER model they are

- ① Entities
- ② Attributes
- ③ Relationships.

- ① Entities =

The entity is a real world object it may be a person, place, thing etc. It is represented by using rectangular symbol.

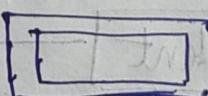


There are two types of entities they are

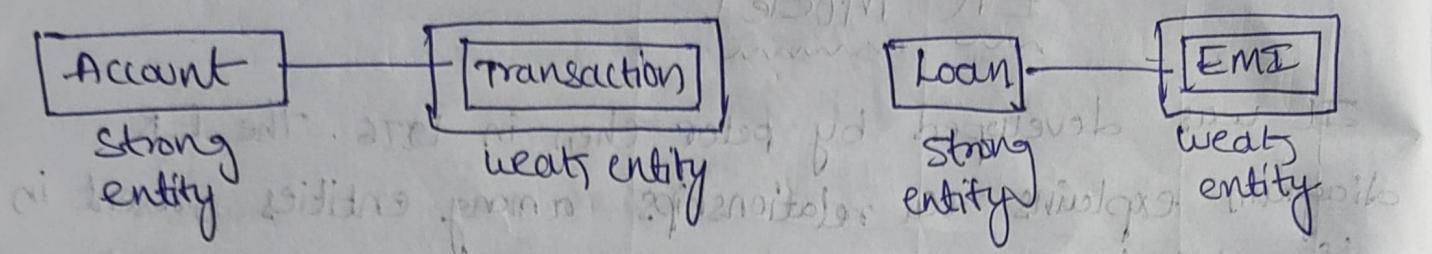
- ① Strong Entity.
- ② Weak Entity.

* strong entity is an independent object and weak entity is a dependent object.

* weak entity is denoted by a rectangle symbol.



Eg:-



2. Attributes:-

It defines the properties of an entity. It is denoted by using ellipse (oval) symbol.

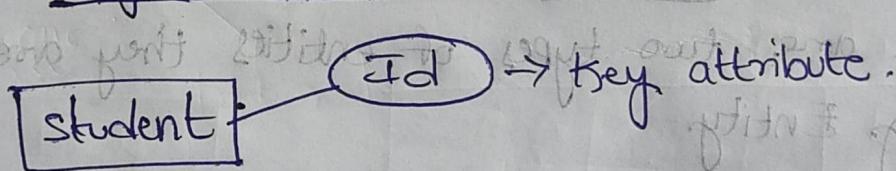
There are 4 types attributes. They are-

1. Key Attribute
2. Composite Attribute
3. Multi value Attribute
4. Derived Attribute

① Key Attribute:-

An attribute that contains unique values known as key attribute.

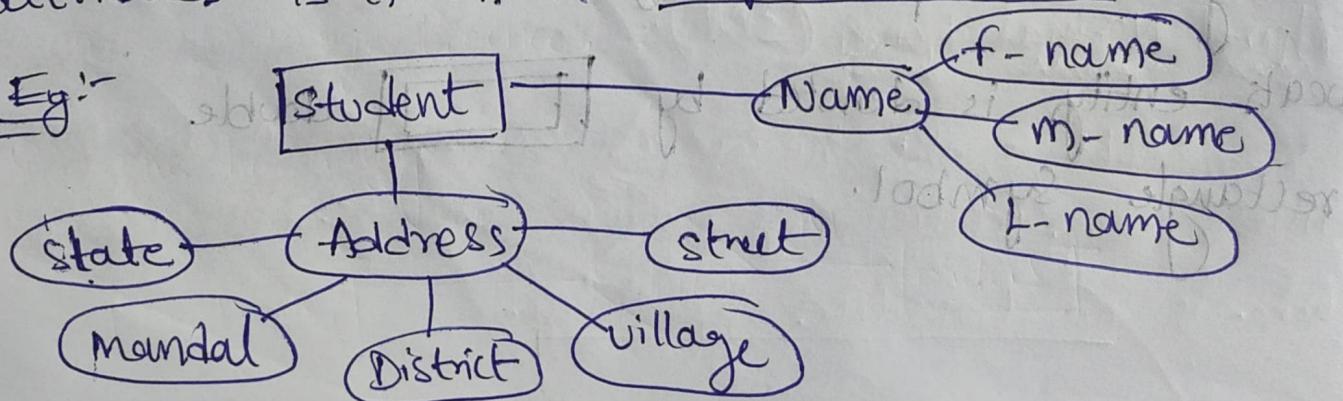
Ex:-



② Composite Attribute:-

An attribute contains combination of other attributes is known as composite attribute.

Eg:-

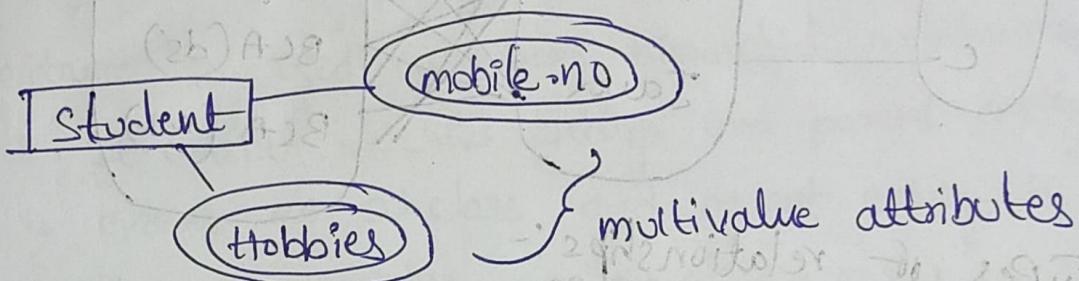


In the above example:- Name & address are the composite attributes.

③ Multi Value Attributes:-

An attribute that stores multiple values is known as multivalue attributes. It is represented by using double ellipse symbol.

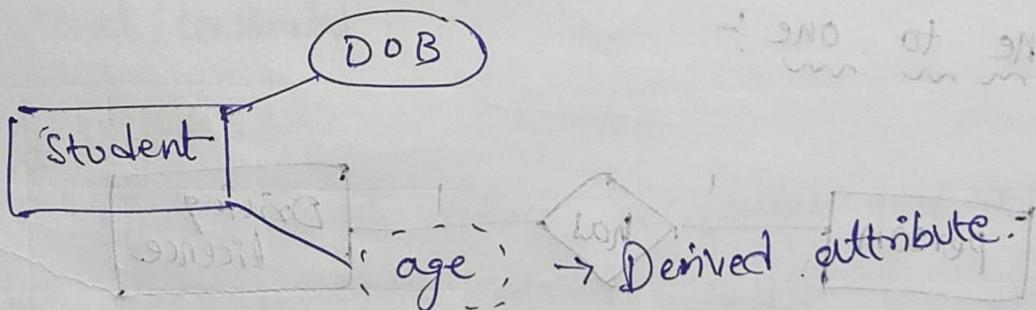
Ex:-



④ Derived Attributes:-

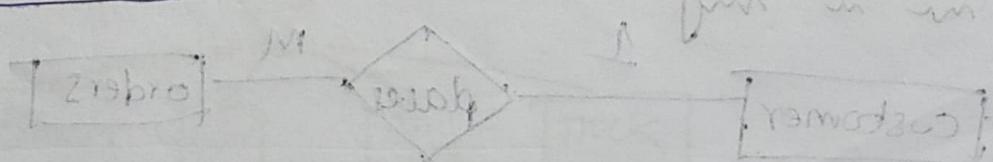
An attribute is derived from another attribute is known as derived attribute. It is represented by using dashed ellipse (---).

Eg:-



⑤ Relationship:-

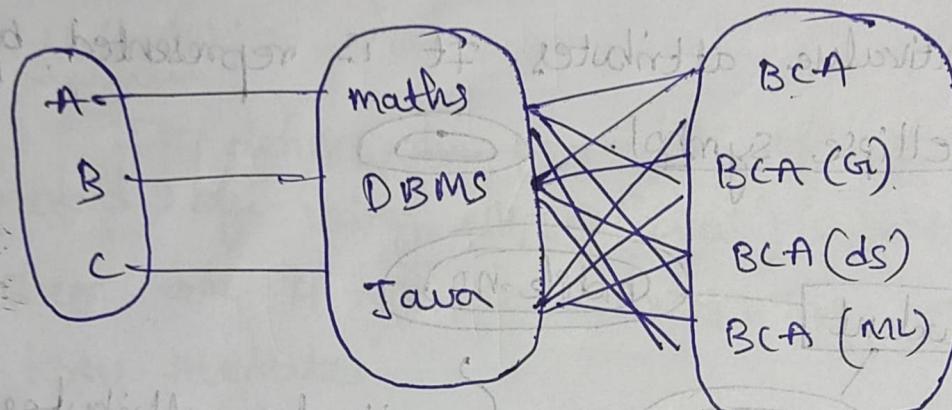
It is used to connect two entities. It is represented by using rhombus symbol.



Relationship set :-

It defines the set of relations of same type

Teacher \rightarrow Teacher student \rightarrow Groups

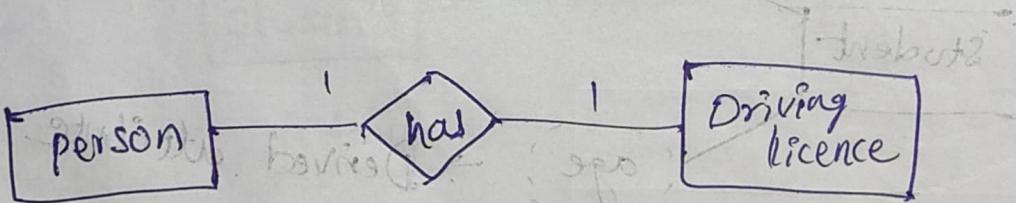


Types of relationships :-

There are 3 types of relationships. They are

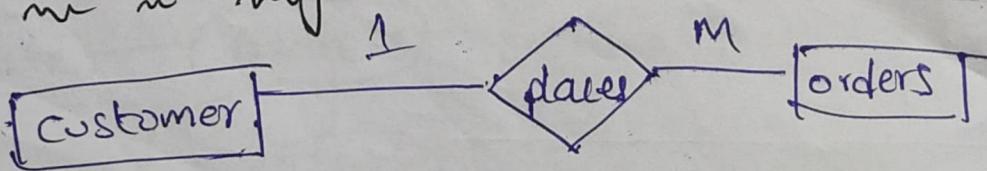
- ① one to one
- ② one to many
- ③ many to many

① one to one :-



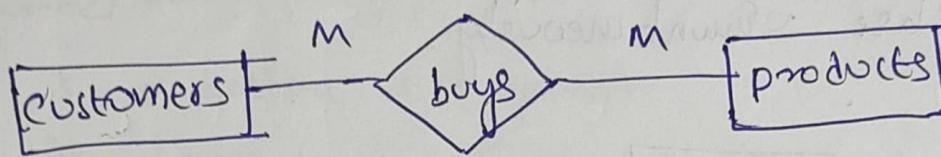
In the above eg one person contains only one Driving licence.

② one to many :-



In the above eg on customer can place many orders.

3. many to many :-



In the above eg many customers buys many products.

Inheritance:-

Inheritance is used to define hierarchical relationship between entities. It consists of child entity and parent entity. Child entity is known as subclass and parent entity is known as superclass. It contains a "IS A" relationship.

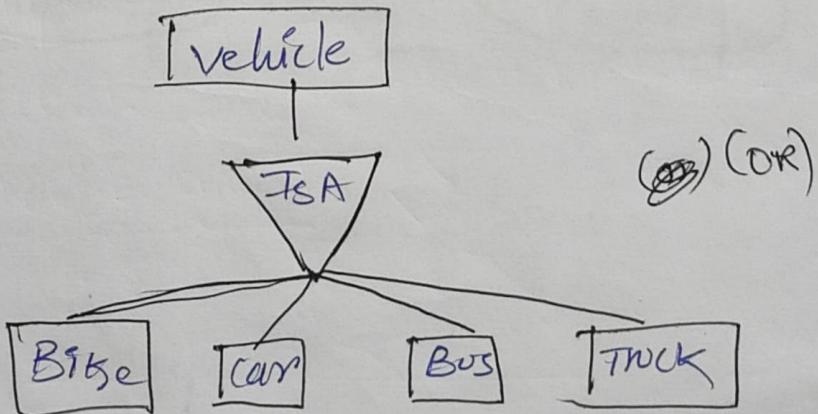
Constraints:-

They are 3 types of constraints.

1. Disjoint constraint
2. Overlap constraint
3. Total constraint.

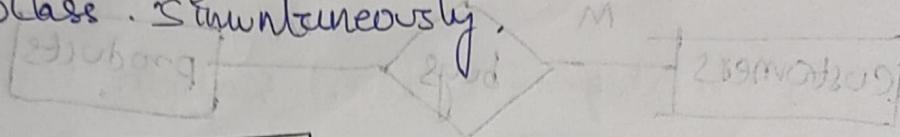
Disjoint constraint:-

This constraint defines a superclass must belong to any one of the subclass at a time.



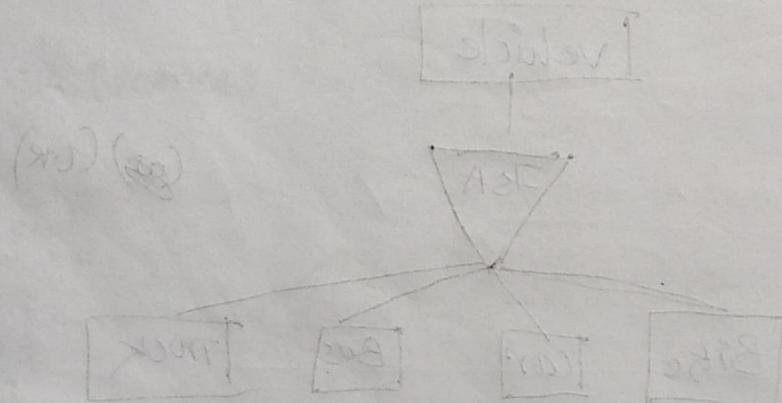
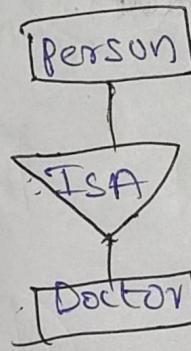
2. Overlap constraints:

This constraint defines superclass must belongs to both subclass simultaneously.



3. Total completeness constraint

This constraint defines a superclass must belongs to only one subclass.

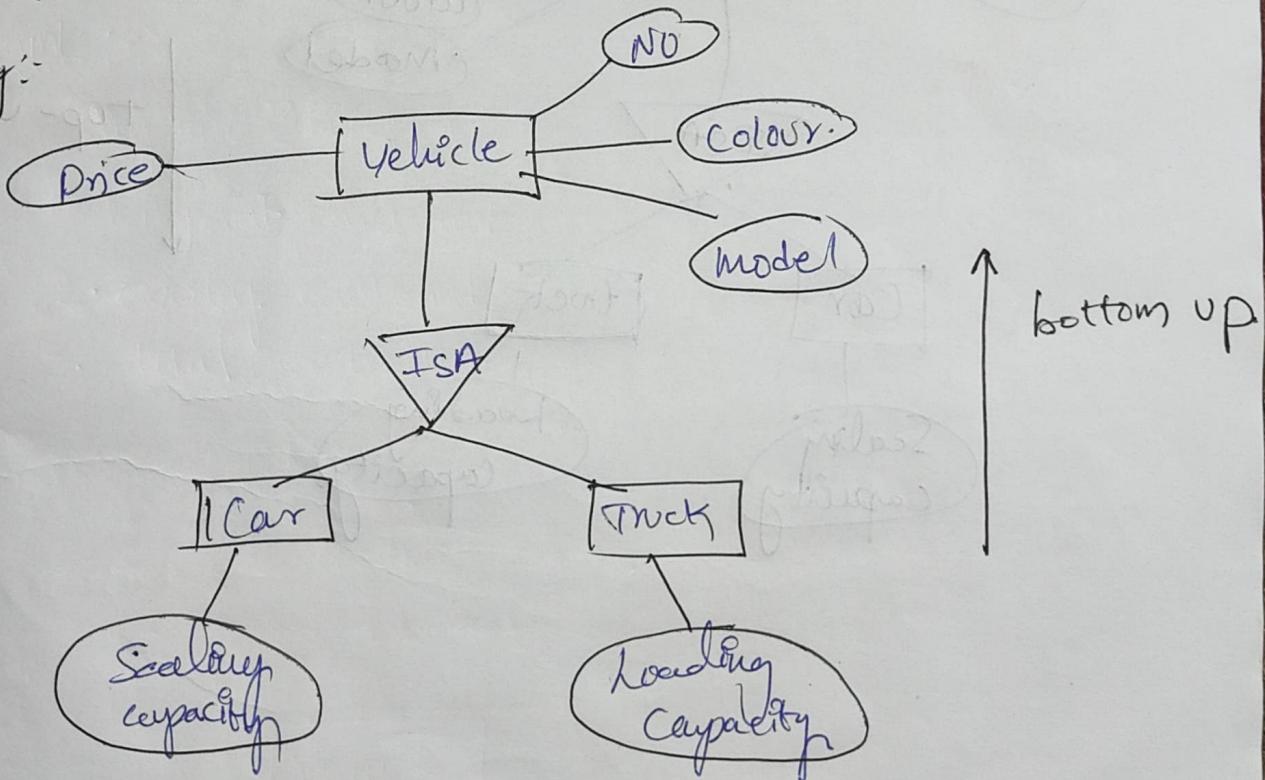


Generalization & Specialization :-

Generalization:-

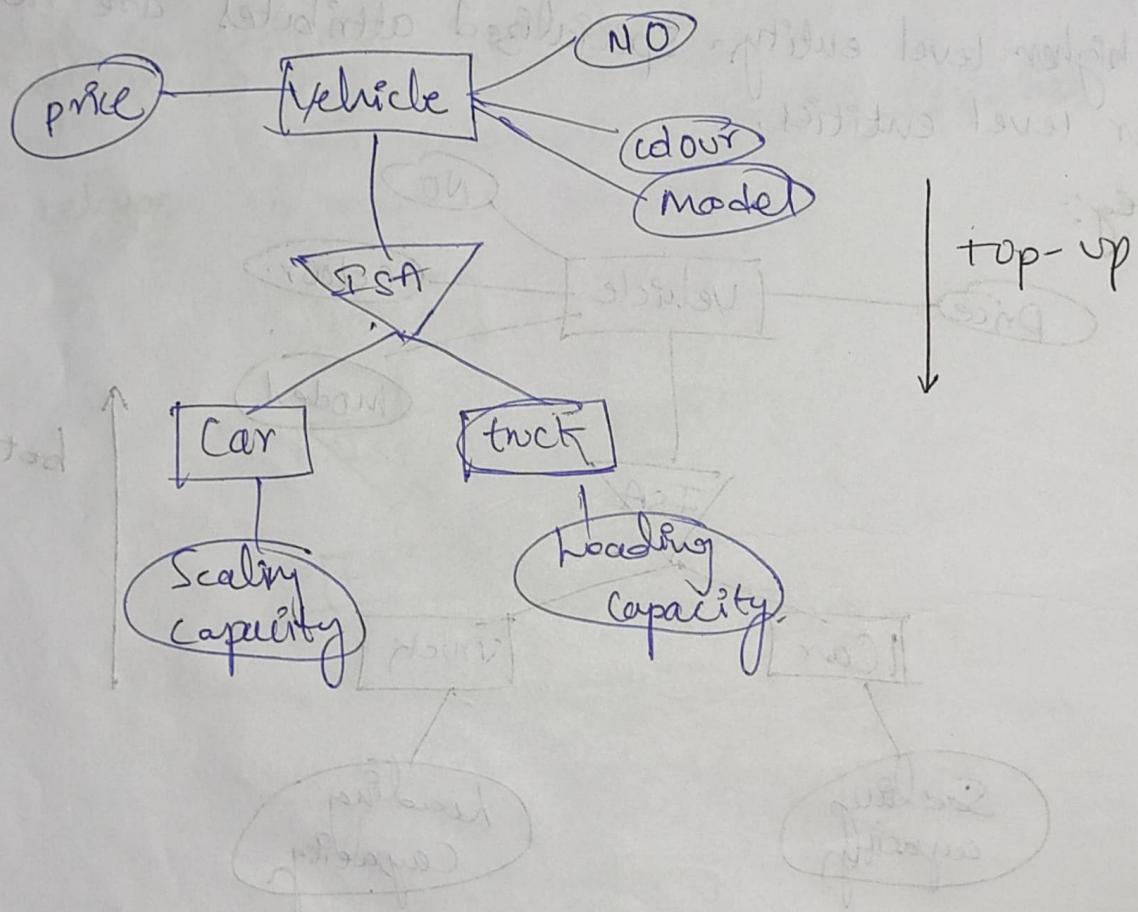
- * It is a bottom up approach
- * All the lower level entities are combined to form a higher level entity.
- * There is a "ISA" relationship between higher level entity and lower level entities.
- * All the common attributes of lower level entities are noted in higher level entity. Specialized attributes are noted in lower level entities.

Eg:-



Specialization :-

- * It is a top down approach.
- * Higher level entity is divided into lower level entity.
- * There is a "ISA" relationship between lower level entity & higher level entity.
- * All the common attributes of lower level entities are noted in higher level entity.



Unit - III - B

Basic SQL

Introduction:-

* SQL means structured Query language.

* The first name of SQL is SEQUEL.

* It is a programming language used for storing and processing information in a relational database.

* It was introduced by Donald D. Chamberlin & Raymond F. Boyce in 1970.

* It allows users to access the database in a lot of ways using different types of queries.

* Queries are created by using different types of commands.
(Instructions)

Data types in SQL:-

The type of the value given to the attribute is known as Datatypes. Datatypes are given to the attributes of a table. types of Datatypes are..

1. int
2. float
3. char
4. varchar
5. date
6. Time

Int :-

It is a integer value. It stores numerical values.

Ex:- id int.

2. float :-

It stores decimal values. Ex:- marks float

3. char :-

It stores characters. The size of the character is between 0 to 255. Ex:- name char(5)

4. Varchar :-

It is a variable character it stores characters from 0 to 65535. Ex:- subject varchar(20)

5. Date :-

It stores the data in the format of YYYY-MM-DD
Ex:- dob Date.

6. Time :-

It stores the time in the format of hh:mm:ss
Ex:- classTiming Time.

Commands in SQL

1. DDL command :-

.. DDL means Data definition management Language

2. These commands are used to Create, Drop, rename, alter, truncate tables.

3. These are also saved Commands

The types of commands are

1. Create

4. Truncate

2. Alter

5. Rename

3. Drop

1. Create :-

(desc - show table)
tablename

It is used to create a new table in the database.

Syntax :-

create table tablename (column names datatype);

Ex:-

create table sethu (id int, name Varchar(20), marks int);

2. Alter:-

It is used to changing the structure

of a table. The change may be either adding
a new attribute or dropping a attribute.

| sethu | | |
|-------|------|-------|
| ID | name | marks |
| | | |
| | | |
| | | |

Syntax:-

1. Alter table tablename add column name datatype;

2. Alter table tablename drop column column name;

Ex:-

1. Alter table sethu add mobilenum int;

| sethu | | |
|-------|------|----------|
| ID | name | mobileno |
| | | |
| | | |
| | | |

2. Alter table sethu drop column marks;

3. Drop :-

It is used to remove the entire table along with
data in a database.

Syntax:-

drop table tablename;

Ex:-

drop table sethu;

4. Truncate :-

It is used to remove all rows in a table but not the entire structure of a table.

Syntax:-

Truncate table tablename;

Ex:-

Truncate table sethu;

5. Rename :-

It is used to change the table name.

Syntax:-

Rename oldtablename to newtablename;

Ex:-

Renamed ~~student~~ sethu to

student; Id [Name] mobile-no
bca

DML Commands:-

DML means Data manipulation language. The types of DML commands are

1. Insert
2. Update
3. Delete

1. Insert :-

It is used to adding row data in a table.

Syntax:-

Insert into tablename values (value1, value2...);

Ex:-
insert into student values (1, 'Sethu', 786534);

2. update :-

It is used to modify row data in a table based on where condition.

Syntax :-

update tablename set column name = value where condition;

Ex:-

Update bca, set name='vardhan' where id=1;

| ID | name | M.NO |
|----|---------|-------|
| 1 | Vardhan | 78534 |

3. Delete :-

It is used to remove the rows in a table based on where condition.

Syntax :-

delete from tablename where condition;

Ex:-

delete from bca where id=1;

| ID | name | M.NO |
|----|------|------|
| | | |

Select and project commands :-

1. Select :-

It is used to get rows from a table

Syntax :-

Select * from tablename;

Ex:-

Select * from bca; (* means it provides all rows in a table)

Select with where condition :-

Syntax:-

Select * from Table name where condition;

Ex:-

Select * from bca where id=1;

Project :-

It returns unique values in a table. In SQL we can use the project command as "select distinct".

Syntax:-

Select distinct ~~from~~ column name from Table name;

Ex:-

Select distinct id from bca;

Operators:-

Operator is a symbol used to perform operation on tables. Types of operators are 1. Arithmetic operators
2. Logical operators.

1. Arithmetic Operator:-

These operators are used to perform mathematical operations like addition, subtraction, multiplication and division.

Addition : +

Subtraction : -

multiplication : *

Division : /

2. Logical operators:-

These operators used to perform logical operations

like AND, OR, NOT on tables

AND: It works if both conditions are true, then the result is true.

OR: If any one of the condition is true, then the result is true.

NOT: It works on single condition. It is a negative operator.

Example:-

① Create table product (name varchar(20), price int, quantity int);

② Insert all into product (name, price, quantity)
values ('oil', 35, 2)

into product (name, price, quantity)
values ('rice', 35, 3)

into product (name, price, quantity)
values ('sugar', 45, 4)

Select * from dual;

③ Select * from product;

④ Select price + 2 as total from product; - Addition

⑤ Select price - 2 as total from product; - Subtraction

⑥ Select price * 2 as total from product; - Multiplication

⑦ Select price / 2 as total from product; - Division

Arithmetic
operators

- ⑧ Select * from product where price > 30 and quality > 3 ;
- ⑨ Select * from product where price > 30 or quality > 3 ;
- ⑩ Select * from product where not name = 'rice';

Aggregate Functions:-

There are 5 types of aggregate functions they are

1. Count()
2. sum()
3. Avg()
4. max()
5. min()

Count():-

It returns total number of rows in a table.

Syntax:-

Select count(*) from table name;

Sum():-

It is similar to addition operator. It performs on numerical column of a table.

Syntax:-

Select sum(column name) from table name;

Avg():-

It returns average value of a numerical column.

Syntax:-

Select avg(column name) from table name;

Max:-

It returns highest value of a numerical column in a table.

Syntax:-

Select max(column name) from table name;

Min() :- It returns least value of a numerical column in a table.

Syntax:-

Select min (column name) from table;

Group by and order by clauses:-

These are often used with aggregate functions.

Group by: it groups similar type of data.

order by: it sort the data either ascending or descending order.

Ex:-

① Create table product (name varchar(5), price int);

② insert all into product (name, price)

values ('rice', 20) ;

into products (name, price)

values ('sugar', 30) ;

into products (name, price)

values ('salt', 30) ;

Select * from dual;

③ Select * from product;

④ Select count (*) from product;

Select sum(price) from product;

Select avg(price) from product;

Select max(price) from product;

Select min(price) from product;

Select name, sum(price) from product group by name;

Select * from product order by product price;

Important Questions:-

1. Define ER model? Explain the components of ER model?
2. Explain the generalization & specialization with example?
3. Explain DDL & DML commands with an Example?
4. Explain the Arithmetic & logical operators in SQL with an example?
5. Explain different types of aggregate functions?
6. Explain the different types of database datatypes in SQL?