3 Explain Relational Algebra with its Operation.

-> Relational Algebra : It is procedural query Language.

Relational Algebra is gives step by step process to obtain result of Quary.

This are the Basic Operation of Relational Algebra.

1 Select Operation :

Symbol - σ

Syntax - σ condition (Relation)

Select operation is used to select required tuples of the relations.

2 Projection Operation :

Symbol - Π

Syntax - Π attribute set (Relation)

Projection Operation is used to select specify attribute set from the data.

3 ~~Cartaisi~~

3 Cartesian Operation:

Symbol: X

Syntax: Relation (R_1) X Relation (R_2)

Cartesian Operation is used to multiple the each tuple of R_1 to each tuple of R_2.

4 Union Operation:

Symbol: U

Syntax: $R_1 \cup R_2$

Union Operation is used to combine the recordes from two or more quary in single result

5 Intersection Operation:

Symbol: $\cap$

Syntax: $R_1 \cap R_2$

Intersection Operation is used to select comman value from two or more quary in single result

6 Difference Operation:

Syntax: $R_1 - R_2$

Symbol: −

Difference Operation is used to returns all the records from first quary.

7 Rename Operation:

Symbol: ρ

Syntax: $\rho_A(x_1, x_2, \ldots, x_n)(\text{Relation})$

Rename Operation is used to changed table and Attributes name from data.

This Operation perform three type of Quary.

(i) $\rho_x(E)$ (ii) $\rho_{(A_1, A_2, \ldots)}(E)$ (iii) $\rho_{x(A, \ldots)}(E)$

Example :

Student

No.	Name	CPI
1	A	9
2	B	9

Branch

Name	Branch
B	CE
C	IT

1 Select Operation : σ Name = "A" (Student)

1	A	8

2 Projection Operation : Π No, Name (Student)

No.	Name
1	A
2	B

3 Cartesian Operation : Student X Branch

No.	S_Name	CPI	B_Name	Branch
1	A	8	CE B	CE
1	A	8	C	IT
2	B	9	B	CE
2	B	9	C	IT

4 Union Operation : Π name (student) U
Π name (Branch)

Name
A
B
C

5 Intersection Operation:

Π name (student) $\cap$ Π name (Branch)

Name
B

6 Difference Operation: Student - Branch
Name Name
: A

7 Rename Operation:

(i) $\rho_{(S\_D)}$ Student - Table name changed

(ii) $\rho_{(N\_S,\ Name\_S,\ C\_S)}$ Student

(iii) $\rho_{(S\_D)}$ $_{(N\_S,\ Name\_S,\ C\_S)}$ Student

4 Explain Join Operation with its types:

Join Operation is used to combines a related tuples from different relation.

There are three types of Join Operation.

(1) Natural Join
(2) Outer Join
(3) Equiv Join

(1) Natural Join:

Symbol: $\bowtie$

Syntax: $R_1 \bowtie R_2$

For Natural Join, we have to perform this three steps.

(i) Perform Cartesian Operation

(ii) Remove In consistance tuple

(iii) Remove Duplicat Attributes.

(2) Outer Join:

There are three types of Outer Join:

(i) Left Outer Join
(ii) Right Outer Join
(iii) Full Outer Join

(i) Left Outer Join: Display all the tuple in left relation even if it does not match in the right side.

(ii) Right Outer Join: Display all the tuple in right relation even if it does not match in the left side

(iii) Full Outer Join: Display all the values of tuple.

Example:

Student

R.no	Name	Branch
1	A	CE
2	B	EE

Result

R.no	SPI
1	8
3	9

1 Natural Join: Student ⋈ Result

(i)

S_R.no	Name	Branch	R.R.no	SPI
1	A	CE	1	8
1	A	CE	2	9
2	B	EE	1	8
2	B	EE	2	9

(ii)

S_R.no	Name	Branch	R_R.no	SPI
1	A	CE	1	8
2	B	EE	2	9

(iii)

R.no	Name	Branch	SPI
1	A	CE	8
2	B	EE	9

2 Outer Join:

(i) Left Outer Join: Student ⟕ Result

R.no	Name	Branch	SPI
1	A	CE	8
2	B	EE	Null

(ii) Right Outer Join: Student ⟖ Result

R.no	Name	Branch	SPI
1	A	CE	8
3	Null	Null	9

(iii) Full Outer Join: Student ⋈ Result

R-no	Name	Branch	SPI
1	A	CE	8
2	B	EE	Null
3	Null	Null	9

5 Explain Integrity Constraints with its types.

Integrity Constraints is one types of set of rules.

Integrity Constraints is used to maintain the quality of information.

There are four type of Integrity Constraints.

(a) Domain Constraint
(b) Entity - Integrity Constraint
(c) Referential Integrity Constraint
(d) Key Constraint

(a) Domain Constraint:

Domain Constraint is use to allow Only vaild set of values for an attribute.

Ex.

ID	Name	Age
1	A	10
2	B	11
3	C	(B)

Age is number not a ch.

(b) Entity - Integrity Constraint:

This Constraint is used to primary key value can not be null.

In this constraint, Primary key is not null value.

Ex.

* ID	Name	Age
1	A	10
2	B	11
O	C	20

ID can not be null.

(c) Referential - Integrity Constraint:

In this Constraint one table contant Forgien key and secound table contant Primary key.

Forgien key in one table refers to primary key in secound table, then every value in table one must be available in table two.

Ex,

Table-1

F.K

E.id	Name	D.id
1	A	24
2	B	(25)
3	C	26

Table-2

*

D.id	Name
24	A
27	B
26	C

25 is not vaild value it is null value or 27 value.

(d) Key Constraint:

In this Constraint, Primary key is always contant unique value.

Ex.

*Id	Name	Age
1	A	10
2	B	11
(1)	C	21

Primary key must be unique.

* Explain Genralization and Specialization and Aggregation.

-> Genralization:

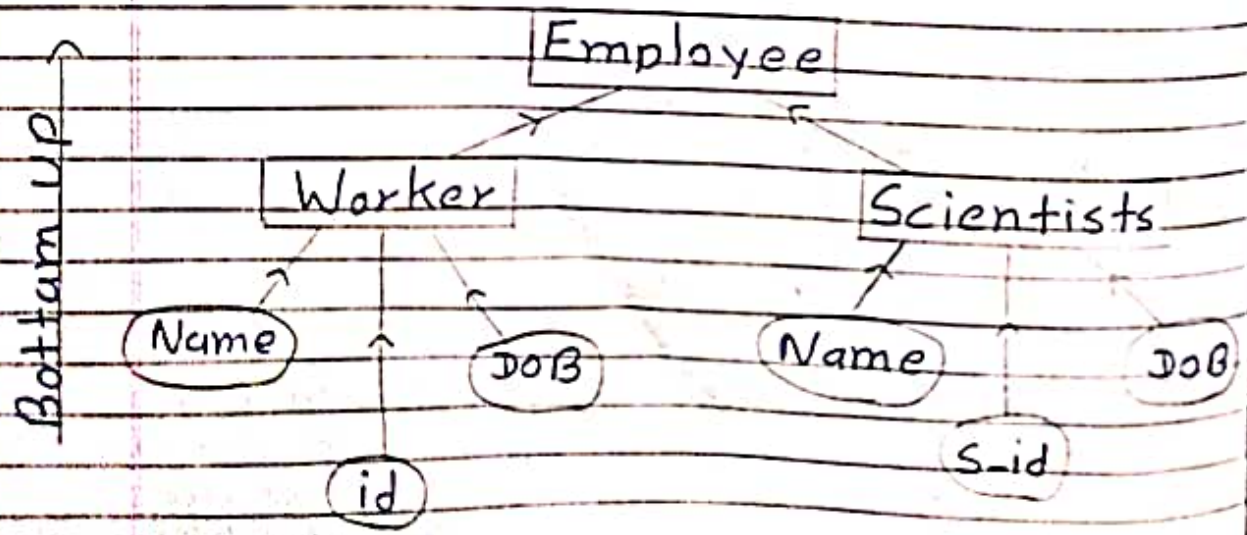
Genralization is works on the principle of Bottam up Approach.

In Genralization, lower level Function are cambined to from Higher level function or Entity.

In Genralization, size of schema gets reduced.

Genralization process starts with the number of entity set and it create high-level entity.

EX.



-> Specialization :

Specialization is works on the principle of top-down approach.

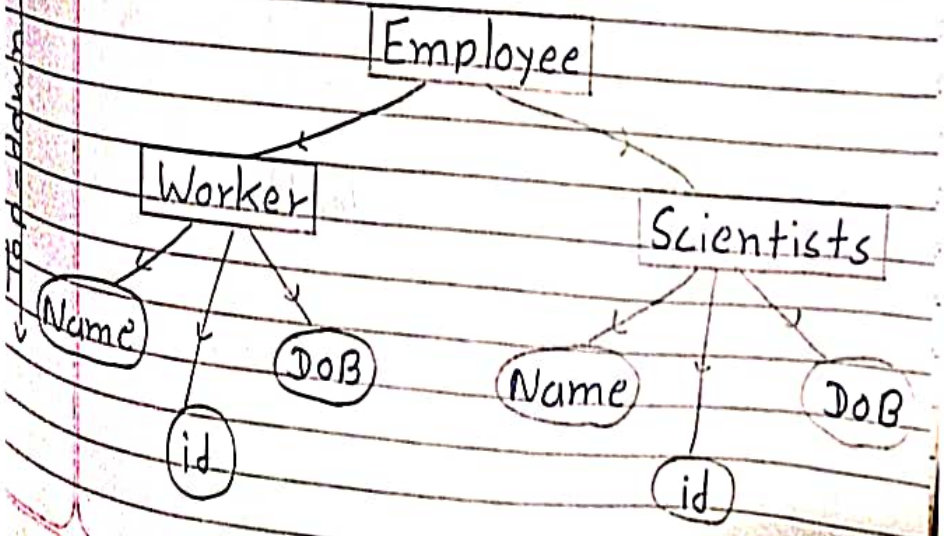
In Specialization, higher level entity are divided into the lower level entity or function.

Specialization is work to opposite of Genralization.

In Specialization, size of schema gets increase.

Specialization is ~~wor~~ starts with high-level entity and create the number of entity set.

Ex



→ Aggregation:

In Aggregation, the relation between two entities is treated as a single entity.

In Aggregation, relationship with its corresponding entities is aggregated into a higher level.

Ex.