

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 query.

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: \times

Syntax: Relation (R_1) \times 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: \cup

Syntax: $R_1 \cup R_2$

Union Operation is used to combine the records from two or more query in single result.

5 Intersection Operation:

Symbol: \cap

Syntax: $R_1 \cap R_2$

Intersection Operation is used to select common value from two or more query in single result.

6 Difference Operation:

Syntax: $R_1 - R_2$

Symbol: $-$

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

7 Rename Operation:

Symbol: ρ

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

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

This Operation perform three type of Query.

- (i) $\rho_x(E)$
- (ii) $\rho_{(A_1, A_2, \dots)}(E)$
- (iii) $\rho_x(A_1, \dots)^E$

Example :

Student

Branch

No.	Name	CPI	Name	Branch
1	A	9	B	CE
2	B	9	C	IT

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

1	A	9
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2 Projection Operation: π No, Name (Student)

No.	Name
1	A
2	B

3 Cartesian Operation: Student \times Branch

No.	S-Name	CPI	B-Name	Branch
1	A	9	CE B	CE
1	A	9	C	IT
2	B	9	B	CE
2	B	9	C	IT

4 Union Operation: π name (student) \cup
 π name (Branch)

Name
A
B
C

5 Intersection Operation:

$$\pi_{name}(student) \cap \pi_{name}(Branch)$$

Name
B

6 Difference Operation: Student - Branch

Name Name

= A

7 Rename Operation:

(i) $P_{(S \rightarrow D)}$ Student - Table name changed

(ii) $P(N-S, Name-S, C-S)$ Student

(iii) $P_{(CS \rightarrow D)}$
 $(N-S, Name-S, C-S)$ student

4 Explain Join Operation with its types:

Join Operation is used to combine related tuples from different relations.

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 these three steps.

- (i) Perform Cartesian Operation
- (ii) Remove Inconsistent tuples
- (iii) Remove Duplicate 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

Result

R.no	Name	Branch
1	A	CE
2	B	EE

R.no	SPI
1	8
3	9

1 Natural Join: Student \bowtie 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 \bowtie Result

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

(ii) Right Outer Join: Student \bowtie Result

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

ciii) Full Outer Join: Student XI 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.

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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
0	C	20

ID can not be null.

(c) Referential-Integrity Constraint:

In this constraint one table contain Foreign key and second table contain Primary key.

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

Ex,

Table-1			Table-2	
F.K	E.id	Name	D.id	*
	1	A	24	A
	2	B	25	B
	3	C	26	C

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

(d) Key Constraint:

In this constraint, Primary key is always constant unique value.

Ex,

*Id	Name	Age
1	A	10
2	B	11
①	C	21

Primary key must be unique.

* Explain Generalization and Specialization and Aggregation.

→ Generalization:

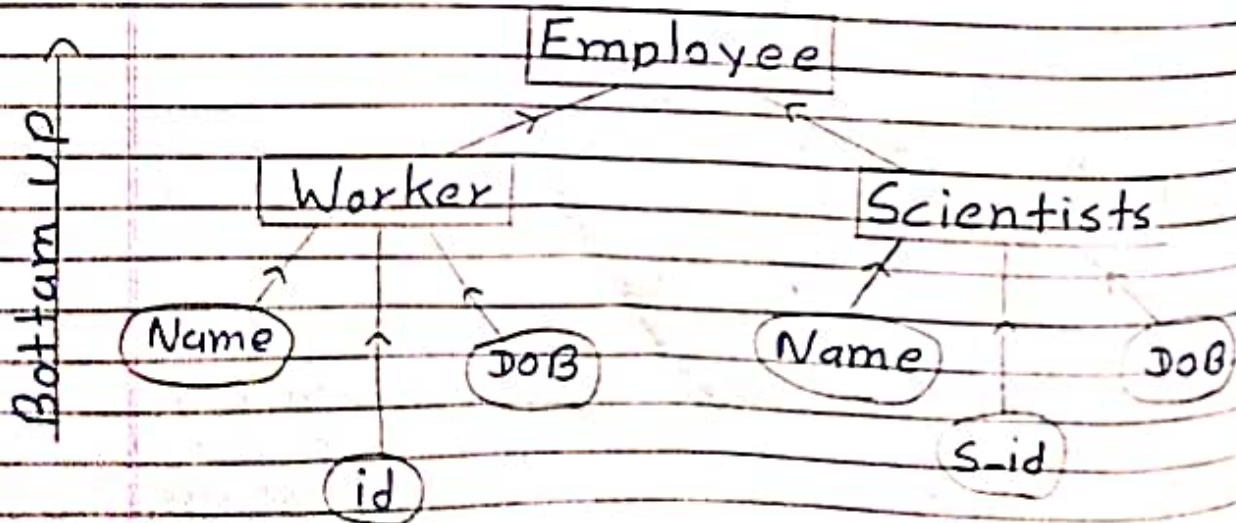
Generalization works on the principle of Bottom up Approach.

In Generalization, lower level functions are combined to form higher level function or entity.

In Generalization, size of schema gets reduced.

Generalization process starts with the number of entity set and it creates high-level entity.

EX.



-> Specialization:

Specialization works on the principle of top-down approach.

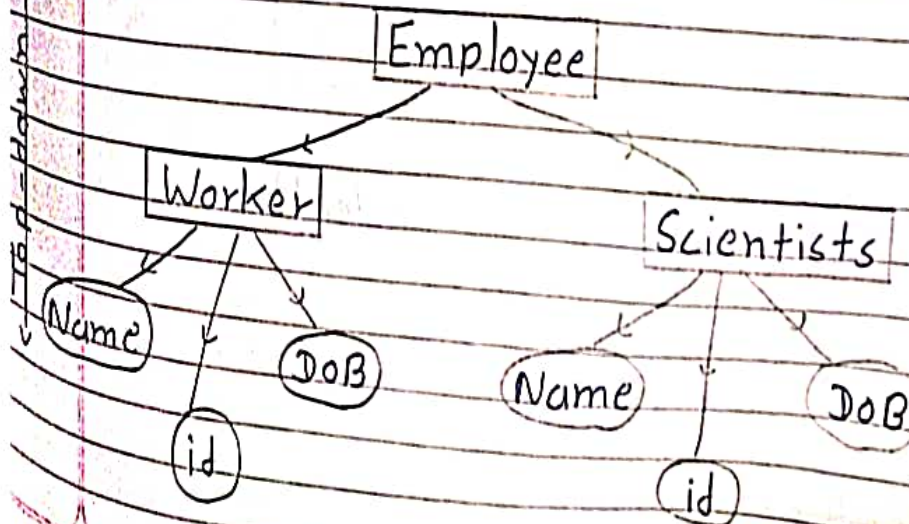
In Specialization, higher level entity are divided into the lower level entity or function.

Specialization is work to opposite of Generalization.

In Specialization, size of schema gets increase.

Specialization ~~is~~ 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.

