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# DBMS

## Assignment-III

## UNIT-IV

Q2.

1. UNION operation in relational algebra is same as union operation in set theory, only constraint is for union of 2 ~~rest~~ relation both relation must have same set of attributes.

NOTATION : $r \cup s$

DEFINED AS: $r \cup s = \{t \mid t \in r \text{ or } t \in s\}$

EXAMPLE: To find all coursed thought in the ~~fall~~ FALL 2009 sem or in the SPRING 2010 sem or in both

$\Pi_{course\_id}(\sigma_{semester = "Fall" \wedge year = 2009}(section)) \cup \Pi_{course\_id}(\sigma_{semester = "Spring" \wedge year = 2010}(section))$

2. Aggregate function takes a collection of values & returns a single value as a result

Example: To find average salary in each department

$dept\_name\ \mathcal{G}_{avg(salary)}(instructor)$

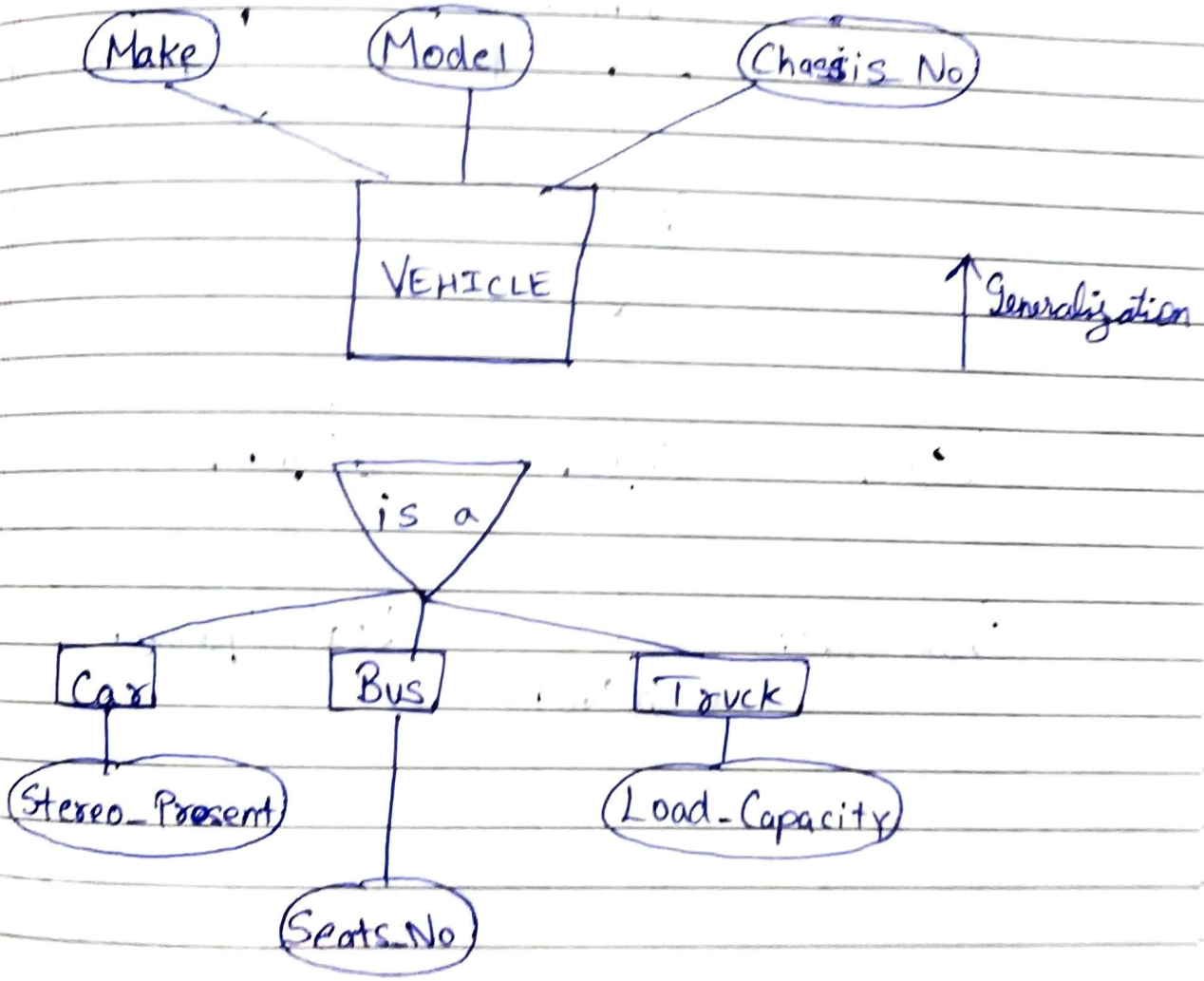
Types

- avg : average value
- min : minimum value
- max : maximum value
- sum: sum of values
- count: number of values

3. Full Outer Join Keyword returns all records when there is a match in left & right table records.
Eg: instructor ~~DC~~ teaches

Q3 GENERALIZATION

Process of extracting common properties from set of entities & create a generalized entity from it. It is bottom up approach in which 2 or more entities can be generalized to a higher level entity if they have some attributes in common.



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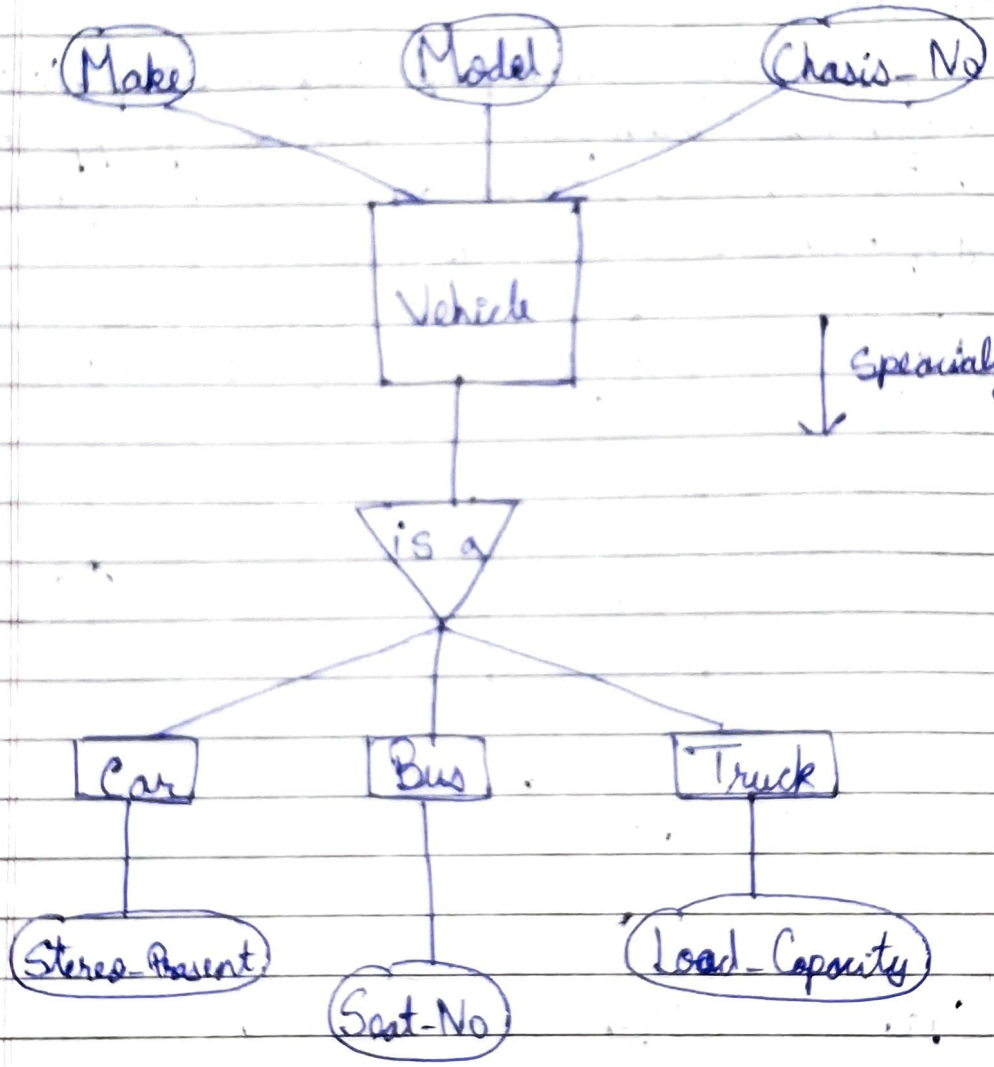
## SPECIALIZATION

An entity is divided into sub-entities based on their characteristics. Its a top-down approach where higher level entity is specialized into 2 or more level lower entities



Q4. UNION OPERATION [∪]

Relation that basically includes all the tuples that are present in both set eleminating duplicate tuples.

A ∪ S

INTERSECTION OPERATION [∩]

Relation that basically includes all the tuples that are present in both set.

A ∩ S

MINUS OPERATION [-]

Relation that basically includes all the tuples that are present in first set but not in second set

A - S

Q5. GENERALIZATION FUNKTION

Extends the projection operation by allowing arithmetic function to be used in the projection list.

Eg: given relation instructor where salary is annual salary, get the same information but with monthly salary.

$\Pi_{ID, name, dept\_name, salary/12}$ (instructor)

NATURAL JOIN

Let R & S be relations on schemas R and S respectively. Then R ⋈ S is a relation on schema R ∪ S.

R = (A, B, C, D)

S = (E, B, D)

R ⋈ S = (A, B, C, D, E)

## RENAME OPERATION

Allows us to name and therefore to refer to, the results of relational algebra expression. Allows us to refer to a relation by more than one name.

Eg: $\rho_x(E)$

this returns the expression E under the name X

Q1.

1. SELECT Suppliers.sname FROM Suppliers, Catalog, Parts WHERE Suppliers.sid = Catalog.sid AND Parts.pid = Catalog.pid AND Parts.color = "red";

2. SELECT Catalog.sid FROM Parts, Catalog
WHERE (Parts.pid = Catalog.pid AND Parts.color = "green")
UNION
~~INTERSECT~~ (SELECT Catalog.sid FROM Parts, Catalog
WHERE (Parts.pid = Catalog.pid AND Parts.color = "red"))

3. SELECT Catalog.sid FROM Parts, Catalog
WHERE (Parts.pid = Catalog.pid AND Parts.color = "red")
INTERSECT (SELECT Catalog.sid FROM Suppliers, Catalog
WHERE (Suppliers.sid = Catalog.sid AND Suppliers.address = "221 Packer Street"))

Q6.

1. $\pi_{driver\_id, amount}(Participated)$

2. $\pi_{name, address}(\sigma_{driver\_id = '10403'}(Person))$

3. $\pi_{name, Issuing\_date}(Person \bowtie Owns) \wedge \pi_{name} = \pi_{drivers\_name}$

Q7.

1. $\pi_{FacNo, FacFirstName}((\pi_{CourseNo = '101'} \wedge \pi_{OffTerm = 'Fall'})(Faculty \bowtie Course)$

2. $\pi_{CourseNo, CourseDescription}(\pi_{CourseCredit > 3}(Course))$

Q8.

1. $\pi_{Empno, Ename}(\pi_{Salary > 20000}(Employee))$

3. $\pi_{DeptNo, Dname, Dlocation\_id}(\pi_{Dlocation\_id = '1'} \vee \pi_{Dlocation\_id = '2'} \vee \pi_{Dlocation\_id = '3'}(Department))$

4. $\pi_{Project\_no, Project\_title}(Project)$