Relational Algebra-Set operations

Sony P

MEC

Relational Algebra Operations from Set Theory

- UNION (∪),
- INTERSECTION (∩),
- DIFFERENCE (or MINUS, −)
- CARTESIAN PRODUCT (x)

Union

- Binary operation, denoted by U .

- The result of A U B, is a relation that includes all tuples that are either in A or in B or in both A and B

- Duplicate tuples are eliminated

- The two operand relations A and B must be "type compatible" (or UNION compatible)
    - A and B must have same number of attributes (arity)
    - Each pair of corresponding attributes must be type compatible (have same or compatible domains)

Q. Retrieve the name of students who study in the class c4 A or in the class c4 B

Student(sName,RollNo,Class,AdmNNo, Age)

sName	RollNo	ClassName	AdmNNo	Age
Anwar	48	c4B	9875	18
Deon	22	c4A	8569	18
Gautham	19	c4B	9854	20
Jabira	33	c4A	7894	19
Jyothis	28	c4B	5894	24
Megha	57	c4A	7526	22
Nevin	38	C4 B	4856	23

Answer

- $\sigma_{\text{Classname}="c4A"}\text{Student} \cup \sigma_{\text{Classname}="c4B"}\text{Student}$

Answer

- π_{sName} ($\sigma_{Classname="c4A"}$Student $\cup$ $\sigma_{Classname="c4B"}$Student)

- Student-O(Name, Regno,batch)
- Student_C(Name1,Regno1,Batch1)

Q. Find the name of the student who either passed out in the year 2020 or studying in the year 2021

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- $\pi_{Name}(\sigma_{batch=2020})(Student\_O) \cup \pi_{name1}(\sigma_{batch1=2021}$ or $\sigma_{batch1=2022}$ or $\sigma_{batch1=2023}$ or $\sigma_{batch1=2024}(\textbf{Student\_C})$

INTERSECTION

- INTERSECTION is denoted by ∩

- The result of the operation A ∩ B, is a relation that includes all tuples that are in both A and B

- The attribute names in the result will be the same as the attribute names in A

- The two operand in the relation A & B must be type -comptiable

Find the name of the student who both passed out in the year 2020 and studying in the year 2021

Find the name of the student who both passed out in the year 2020 and studying in the year 2021

- $\pi_{Name}(\sigma_{batch=2020})(Student\_O) \cap \pi_{name}(\sigma_{batch=2021}$ or $\sigma_{batch=2022}$ or $\sigma_{batch=2023}$ or $\sigma_{batch=2024}(Student\_C)$

SET DIFFERENCE

- SET DIFFERENCE (also called MINUS or EXCEPT) is denoted by –
- The result of A – B, is a relation that includes all tuples that are in A but not in B
- The attribute names in the result will be the same as the attribute names in A
- The two operand relations A and B must be "type compatible"

Find the name of the student who passed out in the year 2020 and but not studying in the year 2021

- πName(σbatch=2020)(Student) – πname(σbatch=2021or σbatch=2022 or σbatch=2023 or σbatch=2024)