I love teaching !!!   Venkatesh

Larry Elisa   video on YT.

How many boolean. function ?

$f(x_1, x_2)$

$$2^{2^2} = 2^4 = 16$$

Where x_1 & x_2
are boolean

Relational Algebra and query Language

relation x ⟶ Query ⟶ Relation Y
                    Language

Fundamental operations :-

More operations

$\sigma_P(r)$ P is selection predicate.

$$\sigma_{dept = "Phy"} (Instructor)$$

Project :- $\quad \pi_{A1, A2, \cdots A_K}(r)$

$$\pi_{iD, \; name, \; salary} (Instructor)$$

Expected to remove duplicates.

Union Operation :-

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

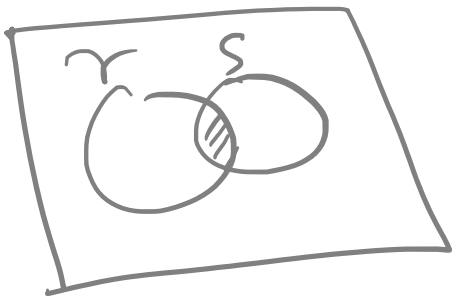r, s have same arity. (same number of attributes)

The attribute domains must be

compatible.

Set Difference Operation :-

$$r - s = \{ t : t \in r \text{ and } t \notin s \}$$

$$\pi_{id} \left(\sigma_{semester = Fall \, \wedge} \right.$$

$$(r \cap s) = r - (r - s) = true$$

Some operations which can be expressed with other operations, So, they are not fundamental.

Cartesian - Product Operation

We are not interested in the whole cartesian product but only the subset of the product.

Join Operation :-

$$r \bowtie_\theta S = \sigma_\theta (r \times S)$$

$$\sigma_{inst.id = teachs.id} (instructor \times teacher)$$

Natural Join :-

Rename operation :-

Some wired way of max salary computation.

$$(A \cup B) \bowtie_{(A.Id > 40 \vee C.Id < 15)}$$

A.		B
	60	15 Shreya 24

```
12  Arum      60    15 Shreya 24
15    Shreya  24    25 Hari    40
99    Rohit   11    98   Rohit 20
                    98    Rohit  11
```

C

```
10    2100   02
99    2100   01
```

(A U B)

```
✓12 Arum      60          ✓12 Arun  60  10  2100
99 Rohit   11                         99  2100
                          ✗12 Arun  60       99 2100

   25 Hari    40          ✓15 Shreya 24  10  2100
✓  98 Rohit   20                          99  2100
✓  99 Rohit   11          ✗15 Shreya 24  99 2100
✓     15  Shreya 24

                          ✓99 Rohit 11  10  2100

                          ✓99 Rohit 11  99 2100

7 accepted  }            ✓98 Rohit 20  10  2200
queries     }  ⟹        ✓25 Harry 40  10  2200
```

✓ 28 Harry 40 10 2200

98 Rohit 20 99 2100