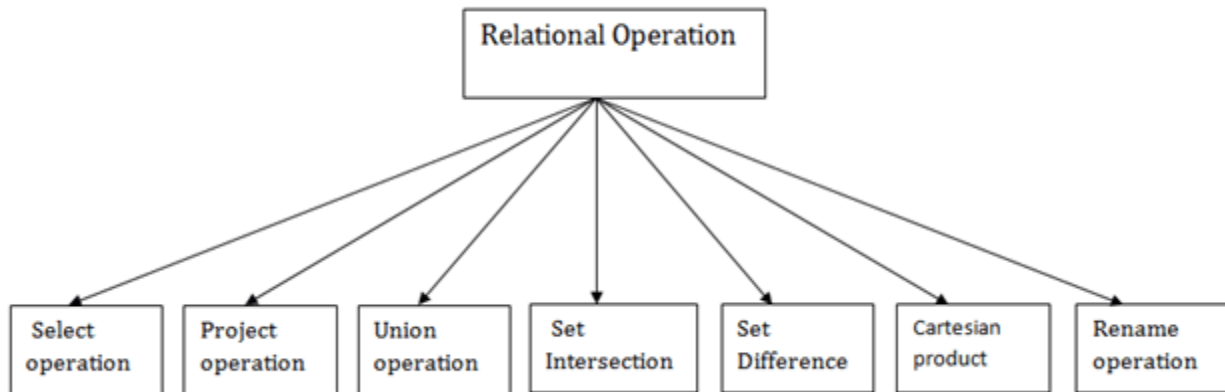


## Types of Relational operation



**Select operation** chooses the subset of tuples from the relation that satisfies the given condition mentioned in the syntax of selection. The selection operation is also known as horizontal partitioning since it partitions the table or relation horizontally.

### Notation:

$\sigma_c(R)$

where 'c' is selection condition which is a boolean expression(condition), we can have a single condition like Roll= 3 or combination of condition like X>2 AND Y<1, symbol 'σ (sigma)' is used to denote select(choose) operator.

R is a relational algebra expression, whose result is a relation. The boolean expression specified in condition 'c' can be written in the following form:

<attribute name> <comparison operator> <constant value> or <attribute name>

where, <attribute name> is obviously name of an attribute of relation, <comparison operator> is any of the operator {<, >, =, <=, >=, !=} and, <constant value> is constant value taken from the domain of the relation.

### Example-1:

$\sigma_{\text{Place} = \text{'Mumbai'} \text{ or } \text{Salary} \geq 1000000}(\text{Citizen})$

$\sigma_{\text{Department} = \text{'Analytics'}}(\sigma_{\text{Location} = \text{'NewYork'}}(\text{Manager}))$

The query above(immediate) is called nested expression, here, as usual, we evaluate the inner expression first (which results in relation say Manager1), then we calculate the outer

expression on Manager1(the relation we obtained from evaluating the inner expression), which results in relation again, which is an instance of a relation we input.

### Example-2:

Given a relation Student(Roll, Name, Class, Fees, Team) with the following tuples:

| Roll | Name   | Department | Fees  | Team |
|------|--------|------------|-------|------|
| 1    | Bikash | CSE        | 22000 | A    |
| 2    | Josh   | CSE        | 34000 | A    |
| 3    | Kevin  | ECE        | 36000 | C    |
| 4    | Ben    | ECE        | 56000 | D    |

Select all the student of Team A :

$\sigma_{\text{Team} = 'A'}(\text{Student})$

| Roll | Name   | Department | Fees  | Team |
|------|--------|------------|-------|------|
| 1    | Bikash | CSE        | 22000 | A    |
| 2    | Josh   | CSE        | 34000 | A    |

Select all the students of department ECE whose fees is greater than equal to 10000 and belongs to Team other than A.

$\sigma_{\text{Fees} \geq 10000}(\sigma_{\text{Team} \neq 'A'}(\text{Student}))$

| Roll | Name  | Department | Fees  | Team |
|------|-------|------------|-------|------|
| 3    | Kevin | ECE        | 36000 | C    |
| 4    | Ben   | ECE        | 56000 | D    |

**Important points about Select operation :** Select operator is Unary, means it is applied to single relation only. Selection operation is commutative that is,

$$\sigma_{c1}(\sigma_{c2}(R)) = \sigma_{c2}(\sigma_{c1}(R))$$