**Practical No 2: Use of Relational Algebraic Operations.**

1. **What is Relational Algebra?**

Relational Algebra is procedural query language. It takes one or two relations as a input and produces a new relation as a output. It provides theoretical way to manipulate the table contents through various operators.

1. **Operator in Relational Algebra.**

Here are some relational algebra operators:

1. Selection: σ

The selection operator is used for selecting a subset of the tuples according to a given selection condition. Sigma(σ)Symbol denotes it. It is used as an expression to choose tuples which meet the selection condition.

1. Projection: П

The projection eliminates all attributes of the input relation but those mentioned in the projection list. The projection method defines a relation that contains a vertical subset of Relation.

1. Union: ᴗ

UNION is symbolized by ∪ symbol. It includes all tuples that are in tables A or in B. It also eliminates duplicate tuples.

1. Intersection: ᴖ

An intersection is defined by the symbol ∩. Defines a relation consisting of a set of all tuple that are in both A and B. However, A and B must be union-compatible.

1. Difference: -

Symbol denotes it. The result of A - B, is a relation which includes all tuples that are in A but not in B.

1. Cartesian Product: x

**Cartesian Product in DBMS** is an operation used to merge columns from two relations. Generally, a Cartesian product is never a meaningful operation when it performs alone. However, it becomes meaningful when it is followed by other operations. It is also called Cross Product or Cross Join.

1. Join: ׀x׀

Join operation is essentially a cartesian product followed by a selection criterion. Join operation denoted by ⋈. JOIN operation also allows joining variously related tuples from different relations.

1. **Use of Relational Algebraic Operations.**

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| **Operation(Symbols)** | **Purpose** |
| Selection(σ) | The SELECT operation is used for selecting a subset of the tuples according to a given selection condition |
| Projection(π) | The projection eliminates all attributes of the input relation but those mentioned in the projection list. |
| Union (∪) | UNION is symbolized by symbol. It includes all tuples that are in tables A or in B. |
| Difference(-) | - Symbol denotes it. The result of A - B, is a relation which includes all tuples that are in A but not in B. |
| Intersection(∩) | Intersection defines a relation consisting of a set of all tuple that are in both A and B. |
| Cartesian Product(X) | Cartesian operation is helpful to merge columns from two relations. |