RELATIONAL ALGEBRA IN SQL

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Abstract- Relational Algebra is that branch of algebra which deals about set operations on a given relation such as UNION,INTERSECTION,DIFFERENCE,CARTESIAN PRODUCT, PROJECTION ,SELECTION. In this paper we shall discuss these operations in terms of SQL(STRUCTURED QUERY LANGUAGE).

INTRODUCTION

I UNION

The union of two relations A and B written as A UNION B is a relation of those tuples which are

either in A or in B or in both A and B. Let us consider two relations A and B defined as follows:

Relation A:

NAME	AGE
MOHAN	35
DINESH	40
RAVI	25

Relation B:

NAME	AGE
MOHAN	35
RAVI	25
HARI	30
PANKAJ	45

The union of the above two relations A and B is defined as follows:

A UNION B

NAME	AGE
MOHAN	35
DINESH	40
RAVI	25
HARI	30
PANKAJ	45

The SQL statement of the above union operation is written as follows:

SQL>SELECT *FROM A UNION SELECT *FROM B;

II INTERSECTION

The intersection of two union compatible relations A and B written as A INTERSECT B is a relation of those tuples which are common in both A and B. Let us consider two relations A and B defined as follows:

Relation A:

NAME	AGE
MOHAN	35
DINESH	40
RAVI	25

Relation B:

NAME	AGE
MOHAN	35
RAVI	25
HARI	30
PANKAJ	45

The intersection of the above two relations A and B is defined as follows:

A INTERSECT B

NAME	AGE
MOHAN	35
RAVI	25

The SQL statement of the above two relations A and B is written as follows:

SQL>SELECT *FROM A INTERSECT SELECT *FROM B ;

III DIFFERENCE

The difference of two union compatible relations A and B written as A MINUS B is a relation of those tuples which are in A but not in B. Let us consider two relations A and B defined as follows:

Relation A:

NAME	AGE
MOHAN	35
DINESH	40
RAVI	25

Relation B:

NAME	AGE
MOHAN	35
RAVI	25
HARI	30
PANKAJ	45

The difference of the above two relations A and B is defined as follows:

A MINUS B

NAME	AGE
DINESH	40

The SQL statement of the above difference operation is written as follows:

SQL>SELECT *FROM A MINUS SELECT *FROM B;

IV PRODUCT

The Cartesian product of two relations A and B written as A × B is a relation which is obtained by concatenating each tuple t €A with each tuple u€B.In this relation degree of the product relation is the sum of the degrees of individual relations and cardinality of the product relation is obtained by multiplying the cardinalities of the individual relations. Let us consider two relations A and B defined as follows:

Relation A:

NAME	AGE
MOHAN	30
DINESH	40

Relation B:

NAME	SAL
RAVI	5000
HARI	8000

The Cartesian product of the above two relations A and B is defined as follows:

A × B

NAME	AGE	NAME	SAL
MOHAN	30	RAVI	5000
MOHAN	30	HARI	8000
DINESH	40	RAVI	5000
DINESH	40	HARI	8000

V SELECTION

It is a unary operation which operate on a single relation and is a horizontal selection of tuples. It is represented by a greek letter σ **(sigma) and is written as follows:**

σ **Condition(Relation name)**

Let us consider a relation A defined as follows:

Relation A:

NAME	AGE	SAL
MOHAN	30	5000
DINESH	40	8000
RAVI	45	8000
HARI	35	9000
PANKAJ	30	8000

Selection operation σ **sal=8000(A) is defined as follows:**

NAME	AGE	SAL
DINESH	40	8000
RAVI	45	8000
PANKAJ	30	8000

The SQL statement of the above select ion is written as follows:

SQL>SELECT *FROM A WHERE SAL=8000;

VI PROJECTION

It is a unary operation which operate on a single relation and is a vertical selection of columns and is written as a greek letter π(Pie). Let us consider a relation A defined as follows:

Relation A:

NAME	AGE	SAL
MOHAN	30	5000
DINESH	40	8000
RAVI	45	8000
HARI	35	9000
PANKAJ	30	8000

The projection of the above relation $\pi_{name,age(A)}$ is defined as follows:

NAME	AGE
MOHAN	30
DINESH	40
RAVI	45
HARI	35
PANKAJ	30

The SQL statement of the above projection is written as follows:

SQL>SELECT NAME,AGE FROM A;

REFERENCES

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