Database Lab

CSE 3104

Session 08

Set Operators in SQL Server (UNION, UNION ALL, INTERSECT, EXCEPT)

 SET operators are mainly used to combine the same type of data from two or more tables. Although more than one select statement will then be present, only one result set is returned.

Rules on Set Operations:

- The result sets of all queries must have the same number of columns.
- In every result set the data type of each column must match the data type of its corresponding column in the first result set.
- In order to sort the result, an ORDER BY clause should be part of the last statement.
- The records from the top query must match the positional ordering of the records from the bottom query.
- The column names or aliases must be found out by the first select statement.

Four Set Operators:

The four set operators union, union all, intersect and except allow us to serially combine two or more select statements.

Operator	Returns
UNION	Combine two or more result sets into a single set, without duplicates.
UNION ALL	Combine two or more result sets into a single set, including all duplicates.
INTERSECT	Takes the data from both result sets which are in common.
EXCEPT	Takes the data from first result set, but not the second (i.e. no matching to each other)

SYNTAX

For set operators, the syntax is simple.

```
1. SELECT [Column_Name, . . . ] FROM [table1] [set operator]
```

```
2.  SELECT [Column_Namse, . . .] FROM [table2] [set operator]
3.  ...
4.  ...
5.  SELECT [Column_Name, . . . ] FROM [tableN]
```

Example

Create two tables with same column name and data type.

```
CREATE TABLE AUST(
Name VARCHAR(15),
TotalMark INT);

CREATE TABLE ULAB(
Name VARCHAR(15),
TotalMark INT);

CREATE TABLE BRACU(
Name VARCHAR(15),
TotalMark INT);
```

Let us insert a few values into the tables.

```
INSERT INTO AUST VALUES('Robert',1063);
INSERT INTO AUST VALUES('John',1070);
INSERT INTO AUST VALUES('Rose',1032);
INSERT INTO AUST VALUES('Abel',1002);

INSERT INTO ULAB VALUES('Robert',1063);
INSERT INTO ULAB VALUES('Rose',1032);
INSERT INTO ULAB VALUES('Boss',1086);
INSERT INTO ULAB VALUES('Marry',1034);

INSERT INTO BRACU VALUES('Rogers',1069);
INSERT INTO BRACU VALUES('Rose',1032);
INSERT INTO BRACU VALUES('Randy',1086);
INSERT INTO BRACU VALUES('Steven',1034);
```

Result

Result Set for AUST table

	Name	TotalMarks
1	Robert	1063
2	John	1070
3	Rose	1032
4	Abel	1002

Result Set for ULAB table

	Name	TotalMarks
1	Robert	1063
2	Rose	1032
3	Boss	1086
4	Marry	1034

Result Set for BRACU table

	Name	TotalMark
1	Rogers	1069
2	Rose	1032
3	Randy	1086
4	Steven	1034

UNION ALL

The SQL UNION ALL Operator is used to list all records from two or more select statements. All the records from both tables must be in the same order.

```
SELECT Name,TotalMark FROM AUST UNION ALL
SELECT Name,TotalMark FROM ULAB;
```

Result

	Name	TotalMarks
1	Robert	1063
2	John	1070
3	Rose	1032
4	Abel	1002
5	Robert	1063
6	Rose	1032
7	Boss	1086
8	Marry	1034

Here Robert and Rose are stored in both tables. UNION ALL retuns all records (including duplicate records).

UNION

The SQL Union ALL Operator is used to combine two tables using select statement when both tables have the same number of columns.

Union works like Distinct. Union all DOES NOT do distinct.

```
SELECT Name,TotalMark FROM AUST UNION
SELECT Name,TotalMark FROM ULAB;
```

Result

	Name	TotalMarks
1	Abel	1002
2	Boss	1086
3	John	1070
4	Marry	1034
5	Robert	1063
6	Rose	1032

The Robert and Rose records are duplicate records. Thus, these are returned only once.

INTERSECT

INTERSECT returns any distinct values that are returned by both the query on the left and right sides of the INTERSECT operand.

```
SELECT Name,TotalMark FROM AUST INTERSECT
SELECT Name,TotalMark FROM ULAB;
```

Result

	Name	TotalMarks
1	Robert	1063
2	Rose	1032

Only the Robert and Rose records are returned, because they are found in both tables.

EXCEPT

EXCEPT query returns all rows which are in the first query but those are not returned in the second query.

Example 1

```
SELECT Name,TotalMark FROM AUST EXCEPT

SELECT Name,TotalMark FROM ULAB;
```

Result

	Name	TotalMarks
1	Abel	1002
2	John	1070

Example 2

EXCEPT returns any distinct values from the left select query that are not also found on the right select query.

```
SELECT Name,TotalMark FROM ULAB EXCEPT

SELECT Name,TotalMark FROM AUST;
```

Result

	Name	TotalMarks
1	Boss	1086
2	Marry	1034

From the two results we understand that if any records are found in both tables, they are removed from the first table's record set.

The four set operators (union, union all, intersect and except) in SQL all have the same precedence. But

*Order of Operations:

1. Expressions in parentheses:

```
(SELECT Name
FROM AUST
UNION ALL
SELECT Name
FROM ULAB)
INTERSECT
SELECT Name
FROM BRACU;
```

Result

	Name
1	Rose

2. The INTERSECT operator

```
SELECT Name
FROM AUST
UNION ALL
SELECT Name
FROM ULAB
INTERSECT
SELECT Name
FROM BRACU;
```

Result

	Name
1	Robert
2	John
3	Rose
4	Abel
5	Rose

3. EXCEPT and UNION evaluated from left to right based on their position in the expression:

```
SELECT Name
FROM AUST
EXCEPT
SELECT Name
FROM ULAB
UNION
SELECT Name
FROM BRACU;
```

Result

	Name
1	Abel
2	John
3	Randy
4	Rogers
5	Rose
6	Steven