EAST WEST UNIVERSITY

Lab-3

CSE302

Database Systems

Sec :05

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SQL Join Clause

SQL join clause is used to combine records from two or more tables from a database.

To create the tables:

```sql
create table Student(
    last_name char(50),
    first_name char(50),
        id int(20),
    major char(50),
    PRIMARY KEY(id));
```

```sql
create table Registration(
    instructor char(50),
    course_name char(50),
    course_location char(50),
    id int(20),
    PRIMARY KEY(id));
```

To insert data:

```sql
INSERT INTO Student(first_name,last_name,id,major)
VALUES('Nadia','Rahman',012,'Biology'),
       ('Sadia','Islam',015,'English'),
       ('Samia','Islam',018,'Biology'),
       ('Zaima','Hossain',210,'English'),
       ('Fiana','Nilhaat',203,'English');
```

```sql
INSERT INTO registration(instructor,course_name,course_location,id)
VALUES('Jones','Biology101','Campus',012),
      ('Jones','Biology101','Campus',202),
      ('Jones','Chemistry101','Online',018),
      ('Miller','English101','Campus',015),
      ('Miller','Writing101','Online',210);
```

Table with values:

```
1 SELECT * FROM `student`
```

```
1 SELECT * FROM registration
```

last_name	first_name	id	major
Rahman	Nadia	12	Biology
Islam	Sadia	15	English
Islam	Samia	18	Biology
Nilhaat	Fiana	203	English
Hossain	Zaima	210	English

instructor	course_name	course_location	id
Jones	Biology101	Campus	12
Miller	English101	Campus	15
Jones	Chemistry101	Online	18
Jones	Biology101	Campus	202
Miller	Writing101	Online	210

Join Table:

```
1 SELECT * FROM student,registration
```

last_name	first_name	id	major	instructor	course_name	course_location	id
Nilhaat	Fiana	203	English	Jones	Biology101	Campus	12
Hossain	Zaima	210	English	Jones	Biology101	Campus	12
Rahman	Nadia	12	Biology	Miller	English101	Campus	15
Islam	Sadia	15	English	Miller	English101	Campus	15
Islam	Samia	18	Biology	Miller	English101	Campus	15
Nilhaat	Fiana	203	English	Miller	English101	Campus	15
Hossain	Zaima	210	English	Miller	English101	Campus	15
Rahman	Nadia	12	Biology	Jones	Chemistry101	Online	18
Islam	Sadia	15	English	Jones	Chemistry101	Online	18
Islam	Samia	18	Biology	Jones	Chemistry101	Online	18
Nilhaat	Fiana	203	English	Jones	Chemistry101	Online	18
Hossain	Zaima	210	English	Jones	Chemistry101	Online	18
Rahman	Nadia	12	Biology	Jones	Biology101	Campus	202
Islam	Sadia	15	English	Jones	Biology101	Campus	202
Islam	Samia	18	Biology	Jones	Biology101	Campus	202
Nilhaat	Fiana	203	English	Jones	Biology101	Campus	202
Hossain	Zaima	210	English	Jones	Biology101	Campus	202
Rahman	Nadia	12	Biology	Miller	Writing101	Online	210
Islam	Sadia	15	English	Miller	Writing101	Online	210
Islam	Samia	18	Biology	Miller	Writing101	Online	210
Nilhaat	Fiana	203	English	Miller	Writing101	Online	210
Hossain	Zaima	210	English	Miller	Writing101	Online	210

Inner join:

Inner join is also known as simple join which returns rows from both table.

```
SELECT student.id,student.major,registration.instructor,registration.course_name
FROM student
INNER JOIN registration
ON student.id=registration.id
```

id	major	instructor	course_name
12	Biology	Jones	Biology101
15	English	Miller	English101
18	Biology	Jones	Chemistry101
210	English	Miller	Writing101

Cross join:

Cross join is used to combine each row of one table with each row of another table and it returns the cartesian product of the sets of rows.

```
SELECT student.id,student.first_name,student.major,registration.course_name
FROM student
CROSS JOIN registration
```

id	first_name	major	course_name
12	Nadia	Biology	Biology101
15	Sadia	English	Biology101
18	Samia	Biology	Biology101
203	Fiana	English	Biology101
210	Zaima	English	Biology101
12	Nadia	Biology	English101
15	Sadia	English	English101
18	Samia	Biology	English101
203	Fiana	English	English101
210	Zaima	English	English101
12	Nadia	Biology	Chemistry101
15	Sadia	English	Chemistry101
18	Samia	Biology	Chemistry101
203	Fiana	English	Chemistry101
210	Zaima	English	Chemistry101
12	Nadia	Biology	Biology101
15	Sadia	English	Biology101
18	Samia	Biology	Biology101
203	Fiana	English	Biology101
210	Zaima	English	Biology101
12	Nadia	Biology	Writing101
15	Sadia	English	Writing101
18	Samia	Biology	Writing101

Left Outer Join:

The left outer join returns all records from the left table even if there are no matches in the right table.

```
SELECT student.last_name,student.first_name,student.major,student.id,registration.course_name
FROM student
LEFT JOIN registration
ON student.id=registration.id
```

last_name	first_name	major	id	course_name
Rahman	Nadia	Biology	12	Biology101
Islam	Sadia	English	15	English101
Islam	Samia	Biology	18	Chemistry101
Nilhaat	Fiana	English	203	*NULL*
Hossain	Zaima	English	210	Writing101

Right outer join:

The right outer join returns all records from the right table even if there are no matches in the left table.

```
SELECT registration.instructor,registration.id,registration.course_name,student.major
FROM student
RIGHT JOIN registration
ON student.id=registration.id
```

instructor	id	course_name	major
Jones	12	Biology101	Biology
Miller	15	English101	English
Jones	18	Chemistry101	Biology
Jones	202	Biology101	*NULL*
Miller	210	Writing101	English

Full Outer Join:

A full outer join is used to combine the results of both left and right outer joins.

```
SELECT*
FROM student
LEFT JOIN registration
ON student.id = registration.id;

UNION
SELECT*
FROM student
RIGHT JOIN registration
ON student.id = registration.id;
```

last_name	first_name	id	major	instructor	course_name	course_location	id
Rahman	Nadia	12	Biology	Jones	Biology101	Campus	12
Islam	Sadia	15	English	Miller	English101	Campus	15
Islam	Samia	18	Biology	Jones	Chemistry101	Online	18
Nilhaat	Fiana	203	English	*NULL*	*NULL*	*NULL*	*NULL*
Hossain	Zaima	210	English	Miller	Writing101	Online	210
NULL	*NULL*	*NULL*	*NULL*	Jones	Biology101	Campus	202

Self-Join:

A self-join is used to join a table to itself.

```
1 SELECT R.instructor,R2.instructor,R.course_name
2 FROM registration as R,registration as R2
3 WHERE R.course_name=R2.course_name
4 ORDER BY course_name
```

instructor	instructor	course_name ▲ 1
Jones	Jones	Biology101
Jones	Jones	Biology101
Jones	Jones	Biology101
Jones	Jones	Biology101
Jones	Jones	Chemistry101
Miller	Miller	English101
Miller	Miller	Writing101

Conclusion:

SQL join clause are very much useful to retrieve data from multiple tables. Join clause works based on relationship on a common set of values. There are different types of join operation which are used based on need. In order to evaluate data quickly from a large quantities of data join clause is used. The advantage of a join includes that it executes faster.